JUNIPER NETWORKS

Junos® OS

Chassis-Level Feature Guide

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Junos® OS Chassis-Level Feature Guide
14.1

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Supported Platforms

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

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

Using the Examples in This Manual

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

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

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

Merging a Full Example

To merge a full example, follow these steps:

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

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

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

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

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

Merging a Snippet

To merge a snippet, follow these steps:

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

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

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

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

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

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

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

For more information about the **load** command, see the *CLI User Guide*.

Documentation Conventions

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

Table 1: Notice Icons

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

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

Table 2: Text and Syntax Conventions

<table>
<tr><th>Convention</th><th>Description</th><th>Examples</th></tr>
<tr><td>Bold text like this</td><td>Represents text that you type.</td><td>To enter configuration mode, type the configure command:

user@host> configure</td></tr>
<tr><td><code>Fixed-width text like this</code></td><td>Represents output that appears on the terminal screen.</td><td><code>user@host></code> show chassis alarms

<code>No alarms currently active</code></td></tr>
<tr><td>Italic text like this</td><td>• Introduces or emphasizes important new terms.
• Identifies guide names.
• Identifies RFC and Internet draft titles.</td><td>• A policy term is a named structure that defines match conditions and actions.
• Junos OS CLI User Guide
• RFC 1997, BGP Communities Attribute</td></tr>
<tr><td>Italic text like this</td><td>Represents variables (options for which you substitute a value) in commands or configuration statements.</td><td>Configure the machine’s domain name:

[edit]
root@# set system domain-name
domain-name</td></tr>
<tr><td>Text like this</td><td>Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.</td><td>• To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level.
• The console port is labeled CONSOLE.</td></tr>
<tr><td>< > (angle brackets)</td><td>Encloses optional keywords or variables.</td><td>stub <default-metric <i>metric</i>>;</td></tr>
<tr><td>| (pipe symbol)</td><td>Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.</td><td>broadcast | multicast

(string1 | string2 | string3)</td></tr>
<tr><td># (pound sign)</td><td>Indicates a comment specified on the same line as the configuration statement to which it applies.</td><td>rsvp { # Required for dynamic MPLS only</td></tr>
<tr><td>[ ] (square brackets)</td><td>Encloses a variable for which you can substitute one or more values.</td><td>community name members [community-ids]</td></tr>
<tr><td>Indention and braces ({ })</td><td>Identifies a level in the configuration hierarchy.</td><td rowspan="2">[edit]
routing-options {
  static {
    route default {
      nexthop address;
      retain;
    }
  }
}</td></tr>
<tr><td>; (semicolon)</td><td>Identifies a leaf statement at a configuration hierarchy level.</td></tr>
</table>

GUI Conventions

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

Convention	Description	Examples
Bold text like this	Represents graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

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- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf.
- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/.
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- Find product documentation: http://www.juniper.net/techpubs/
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- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: http://kb.juniper.net/InfoCenter/
- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/

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

Opening a Case with JTAC

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

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

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

PART 1

Overview

CHAPTER 1

Router Chassis Configuration Overview

Router Chassis Configuration Overview

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

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

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

```
chassis {
  aggregated-devices {
    ethernet {
      device-count number;
      lacp {
        system-priority;
```

```
            link-protection;
         }
      }
      sonet {
         device-count number;
      }
   }
   alarm {
      interface-type {
         alarm-name (red | yellow | ignore);
      }
   }
   config-button {
      no-clear;
      no-rescue;
   }
   craft-lockout;
   fpc slot-number {
      allow-sram-parity-errors;
      port-mirror-instance port-mirroring-instance-name;
      power (off | on);
      sampling-instance;
      sanity-poll {
         retry-count number;
         on-error {
            raise-alarm;
            power cycle; | power off;
            write-coredump;
         }
      }
      pic pic-number {
         port-mirror-instance port-mirroring-instance-name;
         framing (t1 | e1);
         port port-number {
         speed (oc3-stm1 | oc12-stm4 | oc48-stm16);
         }
         adaptive-services {
            service-package (layer-2 | layer-3);
         }
         aggregate-ports;
         atm-cell-relay-accumulation;
         atm-l2circuit-mode (cell | aal5 | trunk trunk);
         vtmapping number;
         ce1 {
            e1 port-number {
               channel-group channel-number timeslots slot-number;
            }
         }
         ct3 {
            port port-number {
               t1 link-number {
                  channel-group channel-number timeslots slot-number;
               }
            }
         }
         egress-policer-overhead bytes;
```

```
        framing (sdh | sonet);
        fru-poweron-sequence;
        idle-cell-format {
          itu-t;
          payload-pattern payload-pattern-byte;
        }
        ingress-policer-overhead bytes;
        linerate-mode;
        max-queues-per-interface (8 | 4);
        mlfr-uni-nni-bundles number;
        number-of-ports;
        no-concatenate;
        q-pic-large-buffer {
          large-scale;
          small-scale;
        }
        red-buffer-occupancy {
          weighted-averaged [ instant-usage-weight-exponent weight-value ];
        }
      sparse-dlcis;
        traffic-manager {
          egress-shaping-overhead number;
          ingress-shaping-overhead number;
          mode {
            egress-only;
            ingress-and-egress;
            session-shaping;
          }
        }
        tunnel-services {
        bandwidth (1g | 10g);
      vtmapping number (itu-t | klm);
      }
    }
    fpc-resync;
    fpc-feb-connectivity {
      fpc slot-number feb (slot-number | none);
    }
    lcc number {
      fpc number {
        pic number {
          atm-cell-relay-accumulation;
          atm-l2circuit-mode (cell | aal5 | trunk trunk);
          framing (sdh | sonet);
          idle-cell-format {
            itu-t;
            payload-pattern payload-pattern-byte;
          }
          linerate-mode;
          max-queues-per-interface (8 | 4);
          no-concatenate;
          no-multi-rate;
          hash-key {
            family {
              inet {
                layer-3;
```



```
                    layer-4;
                    symmetric-hash {
                        complement;
                    }
                }
                multiservice {
                    source-mac;
                    destination-mac;
                    payload {
                        ip {
                            layer-3;
                            layer-4;
                        }
                    }
                    symmetric-hash {
                        complement;
                    }
                }
            }
        }
    }
}
    maximum-ecmp;
    offline;
    online-expected;
    sampling-instance;
}
lcc-mode {
    lcc number {
        mode mode;
    }
}
memory-enhanced {
    filter;
    route;
    vpn-label;
}
(packet-scheduling | no-packet-scheduling);
pem {
    minimum number;
    feeds number-of-input-feeds;
    input-current amps-in-each-feed;
}
no-concatenate;
redundancy {
    cfeb slot (always | preferred);
    failover {
        on-disk-failure
        on-loss-of-keepalives;
    }
    feb {
        redundancy-group group-name {
            feb slot-number (backup | primary);
            description description;
            no-auto-failover;
            }
```

```
        }
      port-mirror-instance port-mirroring-instance-name;
      graceful-switchover;
      keepalive-time seconds;
      routing-engine slot-number (master | backup | disabled);
      sfm slot-number (always | preferred);
      ssb slot-number (always | preferred);
    }
    network-services (ethernet | ip);
    routing-engine {
      on-disk-failure {
        disk-failure-action (halt | reboot);
      }
    }
    sfm slot-number {
      power off;
    }
    sib {
      minimum number;
    }
    vrf-mtu-check;
    vtmapping (itu-t | klm);
    synchronization {
      signal-type (e1 | t1);
      switching-mode (revertive | non-revertive);
      y-cable-line-termination;
      transmitter-enable;
      validation-interval seconds;
      primary (external-a | external-b);
      secondary (external-a | external-b);
    }
  }
```

NOTE: The configuration statements at the **[edit chassis lcc]** hierarchy level apply only to a routing matrix based on a TX Matrix router or a TX Matrix Plus router. For information about a routing matrix composed of a TX Matrix router and T640 routers, see “TX Matrix Router and T640 Router Configuration Overview” on page 173 and the *TX Matrix Router Hardware Guide*. For information about a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers, see “TX Matrix Plus Router Configuration Overview” on page 178 and the *TX Matrix Plus Router Hardware Guide*.

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

Related Documentation

- Router Chassis Configuration Statements on page 454

Port-Mirroring Instances Overview

You can configure port mirroring for IPv4 and IPv6 traffic on all M Series, T Series, and MX Series routers. In addition, on the M7i, M10i, M120, M320, and MX Series routers, you can configure port mirroring for Layer 2 VPLS traffic.

You configure global port mirroring by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level. Configuring port-mirroring properties globally results in the properties being applied system-wide to all the Packet Forwarding Engines and their respective ports.

On MX Series, M320, and M120 routers, you can configure named port-mirroring instances for Layer 2 VPLS traffic. Configuring port-mirroring instances enables you to customize each instance with different properties for input-sampling and port-mirroring output destinations, instead of having to use a single system-wide configuration for port mirroring.

You configure multiple port-mirroring instances by including the **instance *port-mirroring-instance-name*** statement at the **[edit forwarding-options port-mirroring]** hierarchy level. You can then associate individual port-mirroring instances with an FPC, PIC, or FEB (depending on the router).

For more information about configuring port mirroring on all routers, see the *Routing Policies, Firewall Filters, and Traffic Policers Feature Guide for Routing Devices*. For more information on configuring port mirroring for Layer 2 VPLS traffic on MX Series routers, see the *Junos OS Layer 2 Configuration Guide*.

Related Documentation

- Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers on page 236
- Configuring Port-Mirroring Instances on M320 Routers on page 227
- Configuring Port-Mirroring Instances on M120 Routers on page 228

Fabric Fault Handling Overview

The T4000 router consists of a Switch Interface Board (SIB) with fabric bandwidth double the capacity of the T1600 router. The fabric fault management functionality is similar to that in T1600 routers. This topic describes the fabric fault handling functionality on T4000 routers.

The fabric fault management functionality involves monitoring all high-speed links connected to the fabric and the ones within the fabric core for link failures and link errors.

Action is taken based on the fault and its location. The actions include:

- Reporting link errors in system log files and sending this information to the Routing Engine.
- Reporting link failures at the Flexible Port Concentrator (FPC) or at the SIB and sending this information to the Routing Engine.
- Marking a SIB in **Check** state.
- Moving a SIB into **Fault** state.

The SIB in T4000 routers forms the core of the fabric with 4:1 redundancy—the redundant SIB becomes active when the active SIB becomes nonfunctional, is deactivated, or is removed. The following are the high-level indications of fabric faults that are monitored by Junos OS:

- An SNMP trap is generated whenever a SIB is reported as **Check** or **Fault**.
- **show chassis alarms**—Indicates that a SIB is in **Check** or **Fault** state.
- **show chassis sibs**—Indicates that a SIB is in **Check** or **Fault** state or that a SIB is in **Offline** state when the SIB initializes (this occurs when the SIB does not power on fully).
- **show chassis fabric fpcs**—Indicates whether any fabric links are in error on the FPCs' side.
- **show chassis fabric sibs**—Indicates whether any fabric links are in error on the SIBs' side.
- The **/var/log/messages** system log messages file at the Routing Engine has error messages with the prefix **CHASSISD_FM_ERROR**.
- The SIBs display the **FAIL** LED.

NOTE:
The fabric planes in the chassis determine whether the chassis is a T640 router, a T1600 router, or a T4000 router. Power entry modules (PEMs), FPCs, or fan trays do not determine chassis personality. Alarms are raised if the old PEMs or fan trays are present in a T4000 chassis. You can identify a router based on its fabric planes:

- If all planes present are F16-based SIBs, the chassis is a T640 chassis.
- If all planes present are SF-based SIBs, the chassis is a T1600 chassis.
- If all planes present are XF-based SIBs, the chassis is a T4000 chassis.

Note that mixing of fabric planes is not a supported configuration except during upgrade. You can change the personality of a chassis without a reboot by changing all the fabric planes and by issuing the **set chassis fabric upgrade-mode** CLI command to check the personality. If you do not issue the **set chassis fabric upgrade-mode** CLI command, the personality does not change until the next boot.

In T4000 routers, you come across the following faults:

- Board-level faults—These faults occur during initialization or during runtime. Power failure during board initialization, high-speed links transmit error, and polled I/O error during runtime are some examples of board-level faults.
- Link-level faults—These faults occur during initialization or during runtime. Link training failure at initialization time (failure of the data plane links between an FPC and a SIB to be trained when the FPC or SIB is initialized), error detected on the channel between the SIB and a Packet Forwarding Engine, cyclic redundancy check (CRC) errors detected at runtime, and Packet Forwarding Engine destination errors are types of link-level faults.
- Faults based on environmental conditions—These faults occur during runtime. Sudden removal of an FPC or a SIB might result in an operator error. When a SIB becomes too hot or when SIB voltages are beyond thresholds, the errors generated are classified into environmental errors.

You can implement one of the following options to handle the faults:

- Log the error and raise an alarm.
- Switch over to the spare plane, if available.
- Continue with a reduced number of parts of a plane.
- Continue with a reduced number of usable planes.
- Use polling-based fault handling.
- Monitor high-speed link errors and manually bring the link down to a suitable threshold.

The polled I/O errors and the link errors are monitored every 500 milliseconds, and the board exhaust temperature and board voltages are monitored every 10 seconds.

Related Documentation

- *Troubleshooting the T4000 SIBs*
- *Troubleshooting the T4000 FPCs*
- show chassis alarms on page 684
- show chassis fabric fpcs on page 1021
- show chassis fabric sibs on page 1132
- show chassis sibs on page 1519

Fabric Fault Handling Overview on PTX5000 Packet Transport Router

Starting with Junos OS Release 14.1, the PTX5000 Packet Transport Router supports nine Switch Interface Boards(SIBs). Each FPC2-PTX-P1A FPC supports 1Tb per slot capacity, thereby resulting in a fabric bandwidth of 16 terabits per second (Tbps), full-duplex (8 Tbps of any-to-any, nonblocking, half-duplex) switching. A PTX5000 with SIB-I-PTX5008 provides an 8 + 1 active redundancy that supports linerate for all the eight FPC slots.

The fabric fault management functionality involves monitoring all high-speed links connected to the fabric and the ones within the fabric core for link failures and link errors.

The faults that occur in a PTX5000 can be broadly categorized into:

- Board faults—Faults that arise in a SIB or in an Flexible Port Concentrator (FPC) during initialization or during runtime, including issues that arise when a router component is accessing the SIB or FPC or issues that arise out of midplane failures.
- Link faults—Faults that occur on high-level links in a router during initialization or during runtime.
- Faults due to environmental conditions—Faults that occur because of overvoltage or over-temperature; faults that occur because of an operator mishandling a SIB or an FPC, and so on.

The router takes action on the basis of the fault category and the fault location. The actions include:

- Reporting link errors in system log files and sending this information to the Routing Engine.
- Displaying the link errors when you run one of the operational commands listed in Table 3 on page 13:

Table 3: List of Operational Mode Commands

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

- Reporting link failures at the FPC level or at the SIB level and sending this information to the Routing Engine.
- Reporting link error information in the **show chassis alarms** operational command.
- Moving a SIB into *fault* state.

The following sections explain fabric fault handling functionality on the PTX5000:

- SIB-Level Faults on page 14
- FPC-Level Faults on page 15

SIB-Level Faults

The following sections give a brief overview on the types of faults that occur on a SIB and how to handle them:

- Types of Faults That Occur on a SIB on page 14
- Handling SIB-Level Faults on page 15

Types of Faults That Occur on a SIB

Board faults and link faults occur on a SIB during initialization and during runtime. Some faults occur because of environmental conditions such as overvoltage or over-temperature, or when an operator mishandles the SIB.

NOTE: Run the operational mode commands listed in Table 3 on page 13 to detect faults.

During SIB initialization and runtime, the following faults might occur:

- Board faults, such as failure of SIBs to power up, ASICs reset failure, Switch Processor Mezzanine Board (SPMB) polled I/O access failure to ASICs, board component failures such as PIC failures, or router component access failures.
- Link faults such as high-level link errors that occur during link training.
- Faults that occur because of environmental conditions or because of mishandling of the SIB by the operator.

Handling SIB-Level Faults

The following list illustrates how the router handles a fault that occurs on a SIB during initialization, during runtime, because of environmental conditions, and because of mishandling of the SIB by the operator:

- To handle a board fault on a SIB during initialization, the chassis daemon (chassisd) marks the SIB to be in *fault* state. After the SIB is marked as faulty, no operation occurs on this SIB.
- To handle a board fault on a SIB during runtime, chassisd logs an error in the system log file, raises an alarm indication error type, and marks the SIB as faulty. After the SIB is marked as faulty, no operation occurs on this SIB.
- To handle a link fault on a SIB during runtime, when a link error comes up during link training, chassisd informs the FPC corresponding to the link on which the error occurred to disable the links to the affected SIB. The chassisd then sends an error message to all the other FPCs in the router to stop using the failed SIB link and a link error alarm is generated. Note that when more than one FPC report errors for a given SIB, the SIB is disabled for all FPCs and no traffic is sent by the Packet Forwarding Engine through the affected SIB.
- To handle a link fault on a SIB during runtime, chassisd marks the SIB as faulty and specifies a reason for the error, and the SIB is disabled.
- In case of an environmental fault—overvoltage or over-temperature—the SIB is immediately taken offline. Note that an error is logged periodically as the temperature or voltage rises, and the SIB is taken offline when it crosses a certain threshold voltage or temperature.
- When a SIB is abruptly removed or dislodged, all the affected Packet Forwarding Engines stop using that plane to reach other Packet Forwarding Engines in the router.

FPC-Level Faults

The following sections give a brief overview of the types of faults that occur on an FPC and how to handle them:

Types of Faults That Occur on an FPC

Board faults and link faults occur on an FPC during initialization and during runtime. Some faults also occur because of environmental conditions such as overvoltage, over-temperature, or when the operator mishandles the FPC.

NOTE: Run the operational commands listed in Table 3 on page 13 to detect faults.

During FPC initialization and runtime, the following faults might occur:

- Board faults such as failure of FPCs to power up, failure of ASICs to come out of reset phase, PMB polled I/O access failure to ASICs, board component failures such as PIC failure, or router component access failures.
- Link faults such as high-level link errors that occur during link training.
- Faults that occur because of environmental conditions or because of mishandling of an FPC by the operator.

Handling FPC-Level Faults

The following list illustrates how the router handles a fault that occurs on an FPC during initialization, during runtime, because of environmental conditions, and because of mishandling of the FPC by the operator:

- To handle a board fault on an FPC during initialization, chassisd marks the FPC to be in *fault* state. After the SIB is marked as faulty, no operation occurs on this FPC.
- To handle a board fault on an FPC during runtime, chassisd logs an error in the system log file, raises an alarm indication error type, and marks the FPC as faulty. After the FPC is marked as faulty, no operation occurs on this FPC.
- To handle onboard link errors on an FPC during initialization or during runtime, the FPC is taken down and all the affected Packet Forwarding Engines stop using that plane to reach other Packet Forwarding Engines in the router.

> NOTE: **No planes are taken down during initialization because the link training process for the fabric is not yet complete.**
>
> **Onboard link errors during runtime are resolved on the basis of current configuration; either the FPC is rebooted or the error is logged and the FPC continues with initialization.**

- In case of an environmental fault—over voltage or over-temperature—the FPC is immediately taken offline. Note that an error is logged periodically as the temperature or voltage rises, and the FPC is taken offline when it crosses a certain threshold voltage or temperature.
- When an FPC is abruptly removed or dislodged, all the other Packet Forwarding Engines stop sending traffic to the Packet Forwarding Engines in this FPC.

Related Documentation

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

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

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

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

Related Documentation

- *T4000 FPCs Supported*
- *T4000 PICs Supported*

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

You can enable interoperability between the MPC4E (MPC4E-3D-2CGE-8XGE) and the 100-Gigabit Ethernet PIC (PD-1CE-CFP-FPC4) by:

- Enabling source address (SA) multicast bit steering mode on the MPC4E.
- Configuring the two 50-Gigabit Ethernet physical interfaces on the 100-Gigabit Ethernet PIC PD-1CE-CFP-FPC4 as one aggregated Ethernet physical interface.

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

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

Related Documentation

- *forwarding-mode*
- *sa-multicast*
- Configuring MPC4E (MPC4E-3D-2CGE-8XGE) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 251

Fabric Plane Management on AS MLC Modular Carrier Card Overview

The Application Services Modular Line Card (AS MLC) provides high application throughput and storage space, and is designed to run services on the MX240, MX480, and MX960 routers. The AS MLC consists of the following components:

- Application Services Modular Carrier Card (AS MCC)
- Application Services Modular Processing Card (AS MXC)
- Application Services Modular Storage Card (AS MSC)

The AS MCC plugs into the chassis and provides the fabric interface.

An MX960 router can support three Switch Control Boards (SCBs) or six fabric planes. The AS MCC supports six fabric planes. An MX240 or MX480 router can support upto two SCBs or two fabric planes. The AS MCC at any time can provide connectivity to only six of the eight fabric planes. Fabric planes 1 and 5, and 3 and 7 use shared physical links. So between fabric planes 1 and 5 only one plane can be active. Similarly between fabric planes 3 and 7, only one plane can be active.

This behavior impacts the output of fabric-related monitoring commands on MX240 and MX480 routers with AS MCCs.

The **show chassis fpc pic-status** command displays the output for an MX480 router with an AS MCC:

```
user@host>show chassis fpc pic-status
Slot 2    Online        MPC Type 1 3D Q
  Slot 1    Online        AS-MCC
  PIC 0   Online        AS-MSC
  PIC 2   Online        AS-MXC
Slot 4    Offline       MPC 3D 16x 10GE
Slot 5    Offline       AS-MCC
```

In the **show chassis fpc pic-status** command output, **Slot 1 and 5** are AS MCC, **PIC 0** is the AS MSC, and **PIC 2** is the AS MXC.

The **show chassis fabric fpcs** command displays the output on an MX480 router with an AS MCC.

```
user@hostshow chassis fabric fpcs
FPC 2
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
FPC 4
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
```



```
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
  PFE #2
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
FPC 5
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Unused
      Plane 6: Plane enabled
      Plane 7: Unused
```

In the **show chassis fabric fpcs** command output, **FPC 5** is the AS MCC.

The **show chassis fabric plane** command displays the output on an MX480 router with an AS MCC.

```
user@host>show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 1
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 2
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 3
```

```
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 4
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 5
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Unused
Plane 6
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 7
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Unused
```

In the **show chassis fabric plane** output, **FPC 5** is the AS MCC.

The term **Unused** in the output for the **show chassis fabric fpcs** and **show chassis fabric plane** command indicates that one fabric plane from each pair that share physical links (1 and 5, and 3 and 7) is inactive.

See *Junos OS System Basics and Services Command Reference* for more information.

Related Documentation

- show chassis fabric plane on page 1077
- show chassis fabric fpcs on page 1021

Line Card Redundancy Overview

Line card redundancy is one the PTP redundancy scenarios possible in a mobile backhaul solution. Multiple slave streams are configured across line cards and if the currently active slave line card crashes or all streams on that line card lose their timing packets another slave line card can take over if it has been primed to do so.

When you configure line card redundancy, slave streams are created on appropriate line cards. At this time all of the line cards are in DPLL mode. All of the slave streams are primed to receive and process announce messages.

Each line card executes the BMCA algorithm and identifies the best master and the stream serving the best master. The line card sends the best master information to the RE. After receiving best master information from individual line cards, the RE selects the best master to serve the BC node. This information is propagated to all of the line cards. Once the best master is selected by the RE, the regular PTP state machine will be executed.

If the BMCA algorithm results in a stream switchover and the new stream falls on a different line card, a hitless switchover will be triggered. The new slave card may be configured in pure PTP or Hybrid mode. The old slave card may in pure PTP slave or Hybrid slave mode. The line cards need to go through following steps:

- A slave line card transition needs to happen via holdover state on the master line card.
- FSM needs to convert the old slave line card to pure PTP master mode.
- On the new slave card, FSM needs to be triggered based on pure PTP or hybrid mode of operation. All these transitions need to be hitless.

NOTE: Line card redundancy is currently only supported on MPC2E P line cards.

Related Documentation

- show ptp slave on page 1598
- show ptp master on page 1594

Fabric Management on MPC4E Overview

MPC4E is a fixed-configuration MPC that provides scalability in bandwidth and services capability of routers. MPC4E is supported on MX240, MX480, MX960, MX2010 and MX2020 routers. The MPC4E plugs into the chassis and provides the fabric interface.

By default, MX240 and MX480 routers with MPC4E support four active fabric planes each. However, this default fabric redundancy mode, also known as redundant fabric mode, makes the MPC run in reduced bandwidth state. In increased bandwidth mode, the MX240 and MX480 routers with MPC4E support six active fabric planes each. You can increase the number of active fabric planes by changing the mode from redundant fabric mode to increased bandwidth mode. To configure the MPC4E to function in increased bandwidth mode, use the existing **redundancy-mode increased-bandwidth** statement at the **[edit chassis fabric]** hierarchy level.

If you do not configure the fabric redundancy mode, MPC4E functions in redundant fabric mode. To configure the redundant fabric mode, use the existing **redundancy-mode redundant** statement at the **[edit chassis fabric]** hierarchy level.

An MX960 router can support three Enhanced MX Switch Control Boards (SCBEs) or six fabric planes. MX240 and MX480 routers can support up to two SCBEs or four fabric planes each. MX2020 routers can support eight Switch Fabric Boards (SFBs) or 24 fabric planes.

At any given time, on MX240 and MX480 routers, MPC4E can provide connectivity to only six of the eight fabric planes. Fabric planes 1 and 5 and fabric planes 3 and 7 use shared physical links. So, among fabric planes 1 and 5, only one plane can be active. Similarly, among fabric planes 3 and 7, only one plane can be active.

On MX240 and MX480 routers with MPC4E, if the fabric redundancy mode is not configured, then fabric planes 0, 1, 2, and 3 are online and active and fabric planes 4, 5, 6, and 7 are spare. If you configure the increased bandwidth mode, then the fabric planes 0, 1, 2, 3, 4, and 6 are active and fabric planes 5 and 7 are spare.

On MX960 routers with MPC4E, if you configure increased bandwidth mode, then fabric planes 0, 1, 2, 3, 4, and 5 are online. When MPC4E is plugged into an MX960 router, it does not have any fabric redundancy.

MX2020 routers with MPC4E do not support the existing **redundancy-mode** statement. Of the 24 fabric planes, all 24 planes are active.

Related Documentation

- MPC4E on MX Series Routers Overview on page 245
- Example: Configuring Fabric Redundancy Mode on MPC4E on page 426
- **redundancy-mode on page 561**
- **show chassis fabric destinations on page 1005**
- **show chassis fabric fpcs on page 1021**
- **show chassis fabric plane on page 1077**
- **show chassis fabric redundancy-mode on page 1124**
- **show chassis fabric summary on page 1143**

T4000 Power Management Overview

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

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

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

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

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

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

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

Of all the supported FPCss of a T4000 router, the T1600 Enhanced Scaling FPC4 (model number: T1600-FPC4-ES) has the greatest power requirement. Table 4 on page 24 compares the FPC connection limits between a six-input feed 40 A connection and a four-input feed 60 A connection when power management is enabled and T1600-FPC4-ES is connected to router.

Table 4: FPC Connection Limit Comparison

Six Input Feeds with 40 A Connection	Four Input Feeds with 60 A Connection
When T1600-FPC4-ES is *not* connected: • All eight FPC slots can be brought online.	When T1600-FPC4-ES is *not* connected: • A maximum of seven other FPCs can be brought online. That is, only seven slots out of the eight FPC slots can be brought online.
When only one T1600-FPC4-ES is connected: • A maximum of seven other FPCs can be brought online. That is, only seven slots out of the eight FPC slots can be brought online.	When only one T1600-FPC4-ES is connected: • A maximum of six other FPCs can be brought online. That is, only six slots out of the eight FPC slots can be brought online.
When only T1600-FPC4-ES FPCs are connected: • A maximum of six T1600-FPC4-ES FPCs can be brought online.	More than one T1600-FPC4-ES *cannot* be brought online.

NOTE:

- When the power management feature is enabled, FPC power-on consistency is not maintained across router reboots. That is, the same set of FPCs that were powered on before a reboot might not be powered on after the reboot. Before the router reboot, the FPCs are powered on according to their insertion order in the chassis. After the reboot, the FPCs are powered on according to the FRU power-on sequence configured in the **fru-poweron-sequence** statement at the **[edit chassis]** hierarchy level. If the FRU power-on sequence is not configured, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power on the FPCs.

- Removal of any online FPC from the chassis does not change the state of any other FPC and does not trigger the power management feature to power on the FPCs that were not powered on initially because of the lack of sufficient power. When any online FPC is removed from the chassis, if you need to trigger the power management feature to re-evaluate the situation, you need to reboot or restart the chassis. Alternatively, you can make a configuration change at the **[edit chassis]** hierarchy level and then issue the **commit** command to commit the changes made at the **[edit chassis]** hierarchy level. The power management feature to re-evaluates the situation when a configuration change is committed at the **[edit chassis]** hierarchy level.

Related Documentation

- Configuring the Six-Input DC Power Supply on page 375
- Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 263
- **pem on page 544**

- feeds on page 491
- input-current on page 510
- fru-poweron-sequence on page 502

Flexible Queuing Mode Overview

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

The queuing component on non-HQoS MPCs is disabled by default to save power. When flexible queuing is enabled on a non-HQoS MPC, the MPC is restarted with the queuing component enabled. The MPC is powered on only if the PEM has sufficient power to bring up the MPC with the queuing component enabled. The MPC remains offline if the required power is not available.

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

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

- MIC-3D-8CHOC3-4CHOC12
- MIC-3D-4CHOC3-2CHOC12

Related Documentation

- Disabling Flexible Queuing for non-HQoS MPCs to Optimize Power Utilization on page 261
- Upgrading non-HQoS MPCs to Support Flexible Queuing on page 260

Understanding Operations Support Systems Mapping

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

The following sections explain this feature in detail:

Operations Support System Overview

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

When a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis, the OSS identifies the new chassis as a new networking element and follows a time-consuming process of qualifying it for the service provider network. The *OSS mapping feature* helps avoid this scenario.

Using the OSS mapping feature, you can map T4000 chassis to a T1600 chassis or a T640 chassis with the **set chassis oss-map model-name t640 | t1600** configuration command. This configuration command overrides the chassis model name (as is seen in the output of the **show chassis hardware** and the **show chassis oss-map** operational mode commands), so that the OSS recognizes the chassis as a known chassis and proceeds without any requalification.

NOTE:

- The **set chassis oss-map model-name t640 | t1600** command is applicable only on T4000 routers. You must explicitly set this command when a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis.
- You can execute the **set chassis oss-map model-name t640** command or the **set chassis oss-map model-name t1600** command if the OSS is compatible with either the T640 chassis or the T1600 chassis, respectively.

Methods to View the Updated Chassis Name

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

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

Supported Platforms

Table 5: Routers Supporting OSS Mapping

Supported Platforms	Junos OS Release
T4000	12.3R3
T4000	13.1R2
T4000	13.2R1

Points to Remember

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

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

Related Documentation

- Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 264
- Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 445
- **oss-map on page 539**
- **show chassis oss-map on page 1447**

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

CHASSISD_ACQUIRE_MASTERSHIP

System Log Message Acquire mastership notification

Description The chassis process (chassisd) running on the master Routing Engine received a request to acquire mastership.

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

Severity info

Facility LOG_DAEMON

Cause The Routing Engine was probably rebooting and graceful Routing Engine switchover is configured.

CHASSISD_ANTICF_PIM_CHECK_FAILED

System Log Message PIM *pim-slot* failed anti-counterfeit check

Description The indicated Physical Interface Module (PIM) failed the anti-counterfeit check performed by the chassis process (chassisd).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_ANTICF_RE_CHECK_FAILED

System Log Message Routing Engine failed anti-counterfeit check

Description The Routing Engine failed the anti-counterfeit check performed by the chassis process (chassisd).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_ANTICF_RE_ROM_READ_FAIL

System Log Message Unable to read serial number from anti-counterfeit device for Routing Engine

Description The chassis process (chassisd) could not read the serial number recorded in the ROM of the anti-counterfeit device for the Routing Engine.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_ANTICF_RE_SHA_READ_FAIL

System Log Message Unable to read SHA output from anti-counterfeit device for Routing Engine

Description The chassis process (chassisd) could not read Secure Hash Algorithm (SHA) information from the anti-counterfeit device for the Routing Engine.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_ANTICF_ROM_READ_FAILED

System Log Message Unable to read serial number from anti-counterfeit device for PIM *pim-slot*

Description The chassis process (chassisd) could not read the serial number recorded in the ROM of the anti-counterfeit device for the indicated Physical Interface Module.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_ANTICF_SHA_READ_FAILED

System Log Message Unable to read SHA output from anti-counterfeit device for PIM *pim-slot*

Description The chassis process (chassisd) could not read Secure Hash Algorithm (SHA) information from the anti-counterfeit device for the indicated Physical Interface Module (PIM).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_ARGUMENT_ERROR

System Log Message Unknown option *option*

Description The indicated option, provided on the 'chassisd' command line, is invalid. The chassis process (chassisd) initialized but ignored the invalid option.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_BLOWERS_SPEED

System Log Message Fans and impellers are now running at normal speed

Description The fans (and impellers, if applicable) were running at the normal speed.

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

Severity info

Facility LOG_DAEMON

CHASSISD_BLOWERS_SPEED_FULL

System Log Message Fans and impellers being set to full speed [*reason*]

Description For the indicated reason, the chassis process (chassisd) increased the speed of fans (and impellers, if applicable) to the maximum.

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

Severity info

Facility LOG_DAEMON

CHASSISD_BLOWERS_SPEED_MEDIUM

System Log Message Fans and impellers being set to intermediate speed

Description The chassis process (chassisd) increased the speed of fans (and impellers, if applicable) to the intermediate level because of a temperature increase in the chassis.

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

Severity info

Facility LOG_DAEMON

CHASSISD_BUS_DEVICE_OPEN_FAILURE

System Log Message Unable to open '*bus-type*' bus device, error *error-message* (*error-code*)

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18776.

CHASSISD_CB_CLOCK_CHECKSUM

System Log Message Clock module on M120 CB had configuration data checksum error

Description The chassis process (chassisd) detected a checksum error for the clock module on an M120 Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_CB_MASTER_BP_IGNORED

System Log Message Press of online/offline button ignored for master *fru-name fru-slot*

Description The online/offline button for the indicated control board was pressed, but the chassis process (chassisd) ignored the request. The control board for M40e and M160 routers is the Miscellaneous Control Subsystem (MCS). The control board for M320, T320, T640, MX240, MX480 and MX960 routers is the Control Board (CB).

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

Severity error

Facility LOG_DAEMON

Cause The control board was acting as master.

Action Switch mastership to the other control board before taking the control board offline.

CHASSISD_CB_READ

System Log Message Error reading midplane ID EEPROM, errno *error-code*

Description The chassis process (chassisd) could not read the EEPROM on the midplane.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_CB_RE_ONLINE_BP_IGNORED

System Log Message Unable to take *fru-name fru-slot* offline because paired Routing Engine is online

Description The online/offline button for the indicated control board was pressed, but the chassis process (chassisd) ignored the request. The control board for M40e and M160 routers is the Miscellaneous Control Subsystem (MCS). The control board for M320, T320, T640, MX240, MX480 and MX960 routers is the Control Board (CB).

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

Severity error

Facility LOG_DAEMON

Cause The Routing Engine paired with the indicated control board is still online.

Action Take the Routing Engine offline before taking the control board offline.

CHASSISD_CFEB_POWER_FAILURE

System Log Message *function-name*: unable to turn *state* power for CFEB *cfeb-slot*

Description The chassis process (chassisd) could not turn on or turn off the power to the indicated Compact Forwarding Engine Board (CFEB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18777.

CHASSISD_CLEAR_CONFIG_ERROR

System Log Message *function-name*: *status*

Description The chassis process (chassisd) encountered an error while trying to clear the state information associated with a copy of the management process (mgd) that it spawned to commit the rescue configuration. The commit operation succeeded or failed as indicated.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause An internal software failure occurred.

Action Contact your technical support representative.

CHASSISD_CLOCK_FAILURE

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

Description The chassis process (chassisd) determined that the indicated clock source failed in the indicated way.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18778.

CHASSISD_CLOCK_NOTICE

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

Description The clock-synchronization status of the indicated component (field-replaceable unit, or FRU) changed as indicated.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_CLOCK_RESET_FAIL

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_CMB_READBACK_ERROR

System Log Message Readback error from chassis management bus for *fru-name* *fru-slot* ([0x*address*, 0x*offset*] -> 0x*error-code*)

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause The probable cause is hardware error.

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

CHASSISD_COMMAND_ACK_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_COMMAND_ACK_SFM_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_CONCAT_MODE_ERROR

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

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

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

Severity warning

Facility LOG_DAEMON

CHASSISD_CONFIG_ACCESS_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause An internal software failure occurred.

Action Contact your technical support representative.

CHASSISD_CONFIG_CHANGE_IFDEV_DEL

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

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

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

Severity warning

Facility LOG_DAEMON

CHASSISD_CONFIG_INIT_ERROR

System Log Message Unable to parse configuration; using defaults

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_CONFIG_WARNING

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

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

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

Severity warning

Facility LOG_DAEMON

CHASSISD_DEVICE_OPEN_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_EXEC_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause An internal software failure occurred.

Action Contact your technical support representative.

CHASSISD_EXISTS

System Log Message chassisd already running; exiting

Description The chassis process (chassisd) exited because it discovered that another chassisd process is already running.

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

Severity warning

Facility LOG_DAEMON

CHASSISD_EXISTS_TERM_OTHER

System Log Message Killing existing chassisd and exiting

Description The chassis process (chassisd) discovered that another chassisd process is already running. It terminated the other process and exited.

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

Severity warning

Facility LOG_DAEMON

CHASSISD_FAN_FAILURE

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

Description The indicated fan or impeller failed. The chassis process (chassisd) raised an alarm and increased the speed of the remaining fans (and impellers, if applicable) to full speed.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18782.

CHASSISD_FASIC_CONFIG_COMPLETE

System Log Message Fchip: configuration already completed

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FASIC_FTOKEN_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_FASIC_FTOKEN_INIT_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_FASIC_HSL_CONFIG_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_FASIC_HSL_LINK_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_FASIC_INIT_ERROR

System Log Message Fchips were not configured yet

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_FASIC_INPUT_DROP

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_FASIC_OUTPUT_DROP

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

Description The Packet Forwarding Engine divides packets into smaller units called cells for more efficient processing. As the indicated F chip on the indicated Control Board (CB) processed data before sending it to the indicated Packet Forwarding Engine on the indicated Flexible Port Concentrator (FPC) for outgoing transmission, it dropped the indicated number of cells per second.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18789.

CHASSISD_FASIC_PIO_READ_ERROR

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): read error in *function-name*( ) for link#*link-id* at address *address* in register *register*

Description The indicated routine failed with a read error at the indicated address and register for the indicated F chip and link on the indicated Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18790.

CHASSISD_FASIC_PIO_WRITE_ERROR

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): write error in *function-name*() for link#*link-id* at address *address* in register *register*

Description The indicated routine failed with a write error at the indicated address and register for the indicated F chip and link on the indicated Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18791.

CHASSISD_FASIC_PLL_ERROR

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): unable to lock PLL

Description The chassis process (chassisd) could not lock a phased-lock loop (PLL) for the indicated F chip on the indicated Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18792.

CHASSISD_FASIC_RESET_ERROR

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): reset failed

Description The chassis process (chassisd) could not reset the indicated F chip on the indicated Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18793.

CHASSISD_FASIC_SRAM_ERROR

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): SRAM fuse did not initialize

Description The chassis process (chassisd) detected that static RAM (SRAM) did not initialize properly for the indicated F chip on the indicated Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18794.

CHASSISD_FASIC_VERSION_ERROR

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): part number *part-number* and version *version* were invalid

Description The indicated part number and version detected for the indicated F chip on the indicated Control Board (CB) were not valid values.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_CONFIG_COMPLETE

System Log Message Fchip: configuration already completed

Description The chassis process (chassisd) detected an attempt to configure an F chip when configuration was already complete.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_CONFIG_MD_ERROR

System Log Message Fchip *fchip-id*: invalid number of Md chips (*count*) for Packet Forwarding Engine *pfe* on FPC *fpc-slot*

Description The chassis process (chassisd) detected an invalid number of Md chips for the indicated F chip, Packet Forwarding Engine and Flexible PIC Concentrator (FPC).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18795.

CHASSISD_FCHIP_CONFIG_RATE_ERROR

System Log Message Fchip *fchip-id*: unable to set rate limit on port *port*

Description The chassis process (chassisd) could not set the rate limit for the indicated F chip and port.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_CONFIG_READ_ERROR

System Log Message Fchip *fchip-id*: unable to read configuration register

Description The chassis process (chassisd) could not read a configuration register on the indicated F chip.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_FTOKEN_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FCHIP_FTOKEN_INIT_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FCHIP_HSR_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_FCHIP_HSR_INIT_ERROR

System Log Message HSR: No vectors supplied

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_HSR_INIT_LINK_ERR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_HSR_RESET_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_HST_ERROR

System Log Message Fchip high-speed transmitter (HST) error: *error-message*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18797.

CHASSISD_FCHIP_HST_INIT_ERROR

System Log Message HST: No vectors supplied

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_HST_INIT_LINK_ERR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_HST_RESET_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_INIT_ERROR

System Log Message Fchips were not configured yet

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_LINK_ERROR

System Log Message SIB*sib-slot*_F0: *link-type* link *link-id* was bad

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_FCHIP_MONITOR_ERROR

System Log Message F chip module was invalid

Description The chassis process (chassisd) detected an invalid F-chip module while enabling or disabling the monitoring of F-chip functional blocks.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18799.

CHASSISD_FCHIP_PIO_READ_ERROR

System Log Message Fchip *fchip-id*: read error in *function-name*() for link#*link-id*, at address *address* in register *register*

Description The indicated routine failed with a read error at the indicated address and register for the indicated F chip and link.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18800.

CHASSISD_FCHIP_PIO_WRITE_ERROR

System Log Message Fchip *fchip-id*: write error in *function-name*( ) for link#*link-id*, at address *address* in register *register*

Description The indicated routine failed with a write error at the indicated address and register for the indicated F chip and link.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18801.

CHASSISD_FCHIP_POLL_ERROR

System Log Message Fchip *fchip-id*: *link-type link-id* poll returned error *error-code*

Description An error with the indicated error number occurred during polling of the indicated high-speed receiver (HSR) or high-speed transmitter (HST) link for the indicated F chip.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FCHIP_RATE_ERROR

System Log Message Fchip *fchip-id*: per-port rate limit was not enabled

Description The chassis process (chassisd) detected that per-port rate limiting was not enabled when it attempted to set the rate limit on an individual port for the indicated F chip.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FCHIP_SIB_NOT_STARTED

System Log Message Unable to start *fru-name fru-slot* because F chips were not initialized

Description The indicated Switch Interface Board (SIB) did not start because the F chips on it were not initialized.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FCHIP_VERSION_ERROR

System Log Message F chip *fchip-id*: part number (*part-number*) and version (*version*) were invalid

Description The indicated part number and version detected for the indicated F chip were not valid values.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FEB_REVERSION

System Log Message Reversion from FEB *fru-slot* to FEB *slot*

Description The chassis daemon (chassisd) reverted to the indicated FEB from the specified FEB.

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

Severity error

Facility LOG_DAEMON

CHASSISD_FEB_SWITCHOVER

System Log Message Switchover from FEB *fru-slot* to FEB *slot*

Description The chassis daemon (chassisd) switched to the indicated FEB from the specified FEB.

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

Severity error

Facility LOG_DAEMON

CHASSISD_FHSR_READ_REG_ERROR

System Log Message Fchip: fhsr_read() failed at address *address*

Description The high-speed receiver (HSR) read routine failed at the indicated address on an F-chip register.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18802.

CHASSISD_FHSR_WRITE_REG_ERROR

System Log Message Fchip: fhsr_write() of value *value* failed at address *address*

Description The high-speed receiver (HSR) write routine could not record the indicated value at the indicated address on an F-chip register.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18803.

CHASSISD_FHST_READ_REG_ERROR

System Log Message Fchip: fhst_read() failed at address *address*

Description The high-speed transmitter (HST) read routine failed at the indicated address on an F-chip register.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18804.

CHASSISD_FHST_WRITE_REG_ERROR

System Log Message Fchip: fhst_write() of value *value* failed at address *address*

Description The high-speed transmitter (HST) write routine could not record the indicated value at the indicated address on an F-chip register.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18805.

CHASSISD_FILE_OPEN

System Log Message File open: *filename*, error: *error-code* -- *error-message*

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

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18806.

CHASSISD_FILE_STAT

System Log Message File stat: *filename*, error: *error-code* -- *error-message*

Description The chassis process (chassisd) could not open the indicated file because it could not obtain its status.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FM_ACTION_FPC_OFFLINE

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

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

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

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_FPC_ONLINE

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

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

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

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_FPC_POWER_OFF

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

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

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

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_FPC_RESTART

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

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

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

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_PLANE_OFFLINE

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

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

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

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_PLANE_ONLINE

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

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

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

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_BAD_STATE

System Log Message *function-name*: unexpected state *statetype* for SIB#*sib-slot*

Description The indicated function failed because it encountered the indicated type of unexpected internal state with respect to the indicated Switch Interface Board (SIB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_DETECT_PLANES_DOWN

System Log Message All fabric planes in the system have gone down after interfaces have been created. If no fabric planes come online in *elapsed-time* seconds, actions will be taken to address the fabric down condition.

Description The chassis process detected all the fabric planes went down after interfaces were created and the router is not capable of carrying traffic coming in through the interfaces.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_DETECT_UNREACHABLE

System Log Message Some fabric destinations PFEs in the system have become unreachable after interfaces have been created. If the unreachable PFE destinations are not fixed in *elapsed-time* seconds, actions will be taken to address the fabric down condition.

Description The chassis process detected that some Packet Forwarding Engine (PFE) destinations had become unreachable after interfaces were created, and the router is not capable of carrying traffic to the unreachable PFE destinations on the interfaces.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR

System Log Message *function-name*: *error-message* (SIB#*sib-slot*, Packet Forwarding Engine *pfe* on FPC *fpc-slot*)

Description During execution of the indicated fabric management routine, the indicated error occurred between the indicated Switch Interface Board (SIB) and the indicated Packet Forwarding Engine on the indicated Flexible PIC Concentrator (FPC).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18807.

CHASSISD_FM_ERROR_CLOS_F13_HSR

System Log Message FM: *error-message* errors occurred on link from F2-*f2-sib*_SF*from-fchip_s-port* to F13SIB*to-sfc-sib*_SF3_*to-fchip_d-port* on plane *sib-plane*

Description In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the electrical path between the indicated port on the indicated F2SIB and F13SIB on the indicated plane.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_CLOS_F13_HST

System Log Message FM: *error-message* errors occurred on link from F13SIB*from-sfc-sib*_SF1_*from-fchip_s-port* to F2-*f2-sib*_SF*to-fchip_d-port* on plane *sib-plane*

Description In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the transmit electrical path between the indicated port on the indicated F13SIB and F2SIB on the indicated plane.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_CLOS_F2_HSR

System Log Message FM: *error-message* errors occurred on link from F13SIB*from-sfc-sib*_SF1_*from-fchip_s-port* to *f2-sib*_SF*to-fchip_d-port* on plane *sib-plane*

Description In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the electrical path between the indicated port on the indicated F2SIB and F13SIB on the indicated plane.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_CLOS_F2_HST

System Log Message FM: *error-message* errors occurred on link from *f2-sib*_SF*from-fchip_s-port* to F13SIB*to-sfc-sib*_SF1_*to-fchip_d-port* on plane *sib-plane*

Description In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the transmit electrical path between the indicated port on the indicated F2SIB and F13SIB on the indicated plane.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_F13_FB_HSR_TXP

System Log Message *error-message* errors on LCC*lcc*_FPC*fpc-slot_pfe* link via ST_SIB_L*from-lcc-sib*_FB*fiber-bundle* to F13SIB*to-sfc-sib*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_F13_FB_RX_VC

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_F13_FB_TXP

System Log Message F13SIB*sib-slot*_FB_*fiber-bundle* LCC *lcc* ST_SIB_L*to-lcc-sib* is *error-message*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_F13_FB_TX_VC

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_F13_VC_PWR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_CBL

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_HSR_PFE

System Log Message *error-message* errors on link from FPC*lcc* PFE*lc-name* to *pfe* *lcc-sib-name_asic-name*,*asic-port* on LCC*asic-chan* and plane *sib-plane*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_HSR_XC

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_OPTICS_FAULT

System Log Message Optics module on LCC*error-message lcc*, *lcc-sib-name*, connected to SFC*cable-name sc* is *sc-sib-name* on plane *sib-plane*.

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_RX_OPTICS

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_TX_OPTICS

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_CLOS_F13_HSR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_CLOS_F13_HST

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_CLOS_F2_HSR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_CLOS_F2_HST

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_SIB_CBL

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_SIB_HSR_XC

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_SIB_OPTICS_FAULT

System Log Message Optics module on SFC*error-message sc*, *sc-sib-name*, connected to LCC*cable-name lcc* is *lcc-sib-name* on plane *sib-plane*.

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_SIB_RX_OPTICS

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_SIB_TX_OPTICS

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_FB_HSR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18808.

CHASSISD_FM_ERROR_SIB_L_FB_RX_VC

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_FB_SMF

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_FM_ERROR_SIB_L_FB_TXP

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_FB_TX_VC

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_HSR_PFE

System Log Message FM: *error-message* on LCC:*lcc* FPC*fpc-slot_pfe* link to ST-SIB-L*to-lcc-sib_fchip-id*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_HSR_TXP

System Log Message FM: *error-message* on LCC:*lcc* FPC*fpc-slot_pfe* link connected by ST-SIB-L*from-lcc-sib_fchip-id_s-port*_FB*fiber-bundle* to F13SIB*to-sfc-sib*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_MISMATCH

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_VC_PWR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_S_FB_HSR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18810.

CHASSISD_FM_ERROR_SIB_S_FB_SMF

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

Description In a routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the TX Matrix platform (called SIB-Ss) and the SIBs in the T640 routing nodes (line-card chassis, or LCCs). The chassis process (chassisd) on the TX Matrix platform detected the indicated error as packets that were traveling to or from the indicated LCC were translated between electrical and optical media.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18811.

CHASSISD_FM_FABRIC_DEGRADED

System Log Message DPCs are seeing grant timeouts; System is blackholing Need to attempt fabric healing. Action will be taken after *elapsed-time* seconds, to address the fabric down condition.

Description The chassis process detected that the fabric planes are functioning at a degraded capacity and the router is not capable of carrying traffic coming in through the interfaces.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_MEMORY_ERROR

System Log Message *function-name*: unable to allocate memory; *error-message*

Description The chassis process (chassisd) could not allocate memory for a fabric operation.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_SIB_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_FM_SIB_FPC_TYPE_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FPC_NOT_FOUND

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

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

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FPC_OPTICS_HOT_NOTICE

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Increase cooling on FRU or replace optics with high-temperature tolerant optics

CHASSISD_FPC_PIC_DETECT_TIMEOUT

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18813.

CHASSISD_FPC_TYPE_SIB_TYPE_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FRU_ALREADY_OFFLINE

System Log Message *fru-name fru-slot* already offline

Description The chassis process (chassisd) received a request to take the indicated component (field-replaceable unit, or FRU) offline, but the FRU was already offline.

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

Severity error

Facility LOG_DAEMON

CHASSISD_FRU_ALREADY_ONLINE

System Log Message Received request to bring *fru-name fru-slot* online; it was already online

Description The chassis process (chassisd) received a request to bring the indicated component (field-replaceable unit, or FRU) online, but the FRU was already online.

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

Severity warning

Facility LOG_DAEMON

CHASSISD_FRU_EVENT

System Log Message *function-name*: *state fru-name fru-slot*

Description The state of the indicated component (field-replaceable unit, or FRU) changed as indicated.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_FRU_FIRE_TEMP_CONDITION

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis.

CHASSISD_FRU_HIGH_TEMP_CONDITION

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

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

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

Severity error

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis.

CHASSISD_FRU_INVALID_SLOT

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

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

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

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

CHASSISD_FRU_IO_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FRU_IO_OFFSET_ERROR

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

Description The chassis process (chassisd) could not perform the indicated I/O operation at the indicated byte offset.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FRU_IPC_WRITE_ERROR

System Log Message *function-name*: FRU *fru-name*, errno *error-code*, *error-message*

Description The chassis process (chassisd) could not send an interprocess communication (IPC) message to the indicated component (field-replaceable unit, or FRU) because of the indicated error.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

CHASSISD_FRU_OFFLINE_FAILED

System Log Message Unable to take *fru-name fru-slot* offline because FRU sequencer is active: *reason*

Description The chassis process (chassisd) could not take the indicated component (field-replaceable unit, or FRU) offline for the indicated reason.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_FRU_OFFLINE_NOTICE

System Log Message Taking *fru-name fru-slot* offline: *reason*

Description The chassis process (chassisd) took the indicated component (field-replaceable unit, or FRU) offline for the indicated reason.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_FRU_OFFLINE_TIMEOUT

System Log Message Offline request timed out; *fru-name fru-slot* restarted

Description The indicated component (field-replaceable unit, or FRU) did not go offline within the time period that is normally sufficient for synchronized shutdown. After generating this message, the chassis process (chassisd) tried several times to take the FRU offline and powered it down if all attempts failed.

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

Severity warning

Facility LOG_DAEMON

CHASSISD_FRU_ONLINE_TIMEOUT

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

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

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

Severity error

Facility LOG_DAEMON

CHASSISD_FRU_OVER_TEMP_CONDITION

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis.

CHASSISD_FRU_STEP_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FRU_UNRESPONSIVE

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

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

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

Severity error

Facility LOG_DAEMON

CHASSISD_FRU_UNRESPONSIVE_RETRY

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

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

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

Severity error

Facility LOG_DAEMON

CHASSISD_FRU_UNSUPPORTED

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

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

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

CHASSISD_FRU_VERSION_MISMATCH

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

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

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

Severity error

Facility LOG_DAEMON

Action Upgrade the FRU.

CHASSISD_GASIC_ID_ERROR

System Log Message Fchip: invalid SIB slot

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_GBUS_NOT_READY

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause The probable cause is hardware error.

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

CHASSISD_GBUS_READBACK_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause The probable cause is hardware error.

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

CHASSISD_GBUS_RESET_EVENT

System Log Message *fru-name#fru-slot - command*

Description The chassis process (chassisd) reset the GBUS for the indicated component (field-replaceable unit, or FRU). This is a normal part of startup.

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

Severity warning

Facility LOG_DAEMON

CHASSISD_GBUS_SANITY_ERROR

System Log Message *function-name*: *fru-name* *fru-slot* -- management bus failed sanity test

Description The chassis process (chassisd) checks its management GBUS with a set of test operations when it is started. The tests failed.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_GENERIC_ERROR

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

Description The chassis process (chassisd) detected the indicated error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Perform any corrective actions mentioned in the error message.

CHASSISD_GENERIC_WARNING

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

Description The chassis process (chassisd) generated the indicated warning message.

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_GETTIMEOFDAY

System Log Message Unexpected error from gettimeofday: *error-code* -- *error-message*

Description The chassis process (chassisd) could not obtain the time of day because of the indicated error.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

CHASSISD_GRES_UNSUPP_PIC

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_HIGH_TEMP_CONDITION

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

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

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

Severity warning

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis.

CHASSISD_HOST_TEMP_READ

System Log Message Error reading host temperature sensor

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

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_HSR_CONFIG_READ_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_HSR_CONFIG_WRITE_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_HSR_ELEMENTS_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_HSR_FIFO_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_I2CS_READBACK_ERROR

System Log Message Readback error from I2C slave for *fru-name fru-slot* ([0x*i2cs-address*, 0x*offset*] -> 0x*error-code*)

Description The chassis process (chassisd) could not read back information from the I2C slave (I2CS) about the indicated component (field-replaceable unit, or FRU).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause The probable cause is hardware error.

Action Contact your technical support representative.

CHASSISD_I2C_BAD_IDEEPROM_FORMAT

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

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

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18818.

CHASSISD_I2C_FIC_PRESENCE_READ

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_GENERIC_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_INVALID_ASSEMBLY_ID

System Log Message '0x*assembly-id*' is invalid value for *fru-name* assembly ID

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_IOCTL_FAILURE

System Log Message *function-name*: *operation* ioctl failure for group *group-id* at address 0x*address* (errno *error-code*)

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_IO_FAILURE

System Log Message *function-name*: *fru-name operation* failed for group *group-id* at address 0x*address*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_MIDPLANE_CORRUPT

System Log Message Corruption on midplane ID EEPROM (ID: 0x*assembly-id*, MAC address: 0x*mac-address*, 0x*version*)

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_RANGE_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

Action Contact your technical support representative.

CHASSISD_I2C_READ_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_I2C_WRITE_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IDEEPROM_READ_ERROR

System Log Message Unable to read *fru-name* ID EEPROM

Description The chassis process (chassisd) could not read the I2C ID EEPROM of the indicated component (field-replaceable unit, or FRU).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IFDEV_CREATE_FAILURE

System Log Message *function-name*: unable to create interface device for *interface-name* (*error-message*)

Description The chassis process (chassisd) creates initial interface devices for newly installed Physical Interface Cards (PICs) and pseudodevices. It could not create a device for the indicated PIC or pseudodevice.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause Necessary resources might have been unavailable.

Action Contact your technical support representative.

CHASSISD_IFDEV_CREATE_NOTICE

System Log Message *function-name*: created *device-name* for *interface-name*

Description The chassis process (chassisd) created the initial interface device for the indicated newly installed Physical Interface Card (PIC) or pseudodevice.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_IFDEV_DETACH_ALL_PSEUDO

System Log Message ifdev_detach(pseudo devices: all)

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

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

Severity notice

Facility LOG_DAEMON

CHASSISD_IFDEV_DETACH_FPC

System Log Message ifdev_detach_fpc(*fpc-slot*)

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

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

Severity notice

Facility LOG_DAEMON

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

CHASSISD_IFDEV_DETACH_PIC

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

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

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

Severity notice

Facility LOG_DAEMON

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

CHASSISD_IFDEV_DETACH_PSEUDO

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

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

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

Severity notice

Facility LOG_DAEMON

CHASSISD_IFDEV_DETACH_TLV_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_IFDEV_GETBYNAME_NOTICE

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

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

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

Severity warning

Facility LOG_DAEMON

Cause There was a problem with interface state creation.

Action Contact your technical support representative.

CHASSISD_IFDEV_GET_BY_INDEX_FAIL

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_IFDEV_GET_BY_NAME_FAIL

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_IFDEV_NO_MEMORY

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause Resources on the system are extremely limited.

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

CHASSISD_IFDEV_RETRY_NOTICE

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

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

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

Severity warning

Facility LOG_DAEMON

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

CHASSISD_IFDEV_RTSLIB_FAILURE

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IFILTER_INSTALL_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_IOCTL_FAILURE

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IPC_ANNOUNCE_TIMEOUT

System Log Message *function-name*: no ack received from *fru-type* for *fru-name* *fru-slot* state change (0x*sent-mask*, acks 0x*ack-mask*)

Description The chassis process (chassisd) notified the indicated components (field-replaceable units, or FRUs) that the component in the indicated slot was changing state. It did not receive the expected acknowledgment.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IPC_CONNECTION_DROPPED

System Log Message Dropped IPC connection for *fru-name fru-slot*

Description The chassis process (chassisd) dropped its interprocess communication (IPC) connection to the indicated component (field-replaceable unit, or FRU).

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

Severity warning

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18823.

CHASSISD_IPC_DAEMON_WRITE_ERROR

System Log Message pipe_write failure for *connection-id*; connection error: *error-message* (errno *error-code*)

Description The chassis process (chassisd) could not write to a socket, because of the indicated error. The socket is for a connection to another process that runs on the Routing Engine and helps manage the chassis.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_IPC_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IPC_FLUSH_ERROR

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

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

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IPC_MSG_DROPPED

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

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

CHASSISD_IPC_MSG_ERROR

System Log Message *function-name*: error code *error-code*, type *message-type*, subtype *message-subtype*, opcode *message-opcode*

Description The chassis process (chassisd) detected an error in an interprocess communication (IPC) message with the indicated characteristics.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IPC_MSG_FRU_NOT_FOUND

System Log Message *function-name*: unable to locate FRU for message with type *message-type*, subtype *message-subtype*, opcode *message-opcode*

Description The chassis process (chassisd) could not locate a component (field-replaceable unit, or FRU) to handle the interprocess communication (IPC) message with the indicated characteristics that it received. The message was ignored.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IPC_MSG_QFULL_ERROR

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

Description The chassis process (chassisd) had to discard a message because the queue of messages waiting for a connection was already full.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_IPC_MSG_UNHANDLED

System Log Message *function-name*: unable to handle *fru-name* message with type *message-type*, subtype *message-subtype*, length *length*, opcode *message-opcode*, error *error-code*

Description The chassis process (chassisd) received an interprocess communication (IPC) message about the indicated FRU. The message had the indicated characteristics. The chassisd process could not handle the message.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18826.

CHASSISD_IPC_UNEXPECTED_MSG

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IPC_UNEXPECTED_RECV

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_IPC_WRITE_ERROR

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

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

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

CHASSISD_IPC_WRITE_ERR_NO_PIPE

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

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

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

CHASSISD_IPC_WRITE_ERR_NULL_ARGS

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

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

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

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

CHASSISD_ISSU_BLOB_ERROR

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

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

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_ISSU_DAEMON_ERROR

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

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

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_ISSU_ERROR

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

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

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_ISSU_FRU_ERROR

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

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

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_ISSU_FRU_IPC_ERROR

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

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

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_JTREE_ERROR

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

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

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

Severity warning

Facility LOG_DAEMON

CHASSISD_LCC_RELEASE_MASTERSHIP

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

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

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

Severity notice

Facility LOG_DAEMON

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

CHASSISD_LOST_MASTERSHIP

System Log Message Routing Engine lost mastership; exiting

Description The chassis process (chassisd) running on the master Routing Engine exited, because mastership switched to the other Routing Engine.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_MAC_ADDRESS_AE_ERROR

System Log Message chassisd MAC address allocation error for ae*device-id*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_CBP_ERROR

System Log Message chassisd MAC address allocation error for CBP

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_ERROR

System Log Message chassisd MAC address allocation exceed error for FPC *fpc-slot*, PIC *pic-slot*, port *port*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18828.

CHASSISD_MAC_ADDRESS_FABRIC_ERR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18829.

CHASSISD_MAC_ADDRESS_IRB_ERROR

System Log Message chassisd MAC address allocation error for IRB

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_PIP_ERROR

System Log Message chassisd MAC address allocation error for PIP

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_PLT_ERROR

System Log Message chassisd MAC address allocation error for PLT

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_SWFAB_ERR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_VIRB_ERROR

System Log Message chassisd MAC address allocation error for IRB

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_VLAN_ERROR

System Log Message chassisd MAC address allocation error for VLAN

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_VTEP_ERROR

System Log Message chassisd MAC address allocation error for VTEP

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_DEFAULT

System Log Message Using default MAC address base

Description The chassis process (chassisd) used the default base media access control (MAC) address.

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

Severity info

Facility LOG_DAEMON

CHASSISD_MAIN_THREAD_STALLED

System Log Message main chassis-control thread stalled for *duration* sec -- exiting

Description Chassis control daemon main thread did not run for a long duration.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action A core dump of chassis control daemon will be attempted.

CHASSISD_MALLOC_FAILURE

System Log Message *function-name*: chassisd malloc failed, aborting

Description The chassis process (chassisd) could not allocate memory. The chassisd process tried to continue functioning, but the lack of memory usually causes the process to fail. An administrator needs to restart it at some point.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18830.

CHASSISD_MASTER_CG_REMOVED

System Log Message Master *fru-name* (slot *fru-slot*) removed; powering it down

Description The master Clock Generator (CG) was removed. The CG provides the clock for interfaces timing, so those interfaces might drop packets and experience other errors until a new clock source has been established.

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

CHASSISD_MASTER_PCG_REMOVED

System Log Message Master PCG (slot *pcg-slot*) removed; powering down Packet Forwarding Engine complex

Description The master Packet Forwarding Engine Clock Generator (PCG) was removed. The PCG provides the system clock for all application-specific integrated circuits (ASICs) in the routing platform, so packet forwarding halts until the Packet Forwarding Engine is restarted and a PCG is functioning as master.

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

CHASSISD_MASTER_SCG_REMOVED

System Log Message Master SCG (slot *fru-slot*) removed; powering it down

Description The master SONET Clock Generator (SCG) was removed. The SCG provides the clock for SONET/SDH interface timing, so those interfaces might drop packets and experience other errors until a new clock source is established.

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

CHASSISD_MBUS_ERROR

System Log Message *fru-name fru-slot*: management bus failed sanity test

Description Startup tests on the indicated FRU's management bus failed.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_MCHASSIS_SWITCH_WARNING

System Log Message CB settings on *chassis-type old-index* changed: switch is now '*value*', chassis index is now 0x*new-index*

Description A toggle switch on the back of the Control Board on each platform in a routing matrix is set to 'M' (multichassis) on the T640 routing nodes and to 'S' (single-chassis) on the TX Matrix platform. On a T640 routing node, the adjacent dial is set to the node's index number in the routing matrix (0 through 3); on the TX Matrix platform it is set to 0. The setting of the toggle switch, the dial, or both, changed to the indicated values on the indicated platform. The new settings take effect when the routing matrix next reboots.

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

Severity warning

Facility LOG_DAEMON

Action If the changes were accidental, return the toggle and dial to the correct settings before the next reboot. If the changes were intended, disconnect and move the cables on the TX Matrix platform Switch Interface Board (SIB) to the row that corresponds to the T640 routing node's new index number.

CHASSISD_MCS_INTR_ERROR

System Log Message Received SIGUSR2 without any interrupts pending

Description The chassis process (chassisd) received the indicated interrupt signal. The signal normally indicates that an event on the Miscellaneous Control Subsystem (MCS) requires servicing. However, the chassisd process did not find such an event pending. This error does not usually cause component failure.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_MGR_CONNECT

System Log Message *function-name* evSelectFD: initial pipe create aborted (errno *error-code*)

Description The chassis process (chassisd) could not to open a pipe for interprocess communication (IPC) to a component (field-replaceable unit, or FRU).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_MIC_OFFLINE_NOTICE

System Log Message Taking MIC *mic-slot* in FPC *fpc-slot* offline: *reason*

Description The chassis process (chassisd) took the indicated MIC offline, for the indicated reason.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_MULTILINK_BUNDLES_ERROR

System Log Message Unable to set multilink Frame Relay UNI NNI bundles for PIC *pic-slot* in FPC *fpc-slot*

Description The chassis process (chassisd) could not create multilink Frame Relay user-to-network interface and network-to-network interface (MLFR UNI NNI [FRF.16]) bundles for the indicated PIC.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_MXC_LINK

System Log Message MXC: *operation*: *filename*, error: *error-code -- error-message*

Description The chassis process (chassisd) could not link the specified package to the application services (AS-MXC) PIC.

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_NO_CGS

System Log Message No *fru-name status*

Description The chassis process (chassisd) could not find an operational Clock Generator (CG). To continue functioning properly, interfaces that use a CG as their clock source must find another source.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_NO_PCGS

System Log Message No PCG *status*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_NO_SCGS

System Log Message No SCG *state*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_OFFLINE_NOTICE

System Log Message Routing Engine offline: *message*

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

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

Severity critical

Facility LOG_DAEMON

CHASSISD_OID_GEN_FAILED

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_OVER_TEMP_CONDITION

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_OVER_TEMP_SHUTDOWN_TIME

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

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

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

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

CHASSISD_PARSE_COMPLETE

System Log Message Using new configuration

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

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

Severity info

Facility LOG_DAEMON

CHASSISD_PCI_ERROR

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

Description While performing an operation on the PCI bus, the chassis process (chassisd) encountered the indicated error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause A software or a hardware problem occurred.

Action Contact your technical support representative.

CHASSISD_PDU_BREAKER_TRIP

System Log Message Circuit breaker tripped for PDU *pdu-slot*

Description The circuit breaker was tripped for the indicated power distibution unit (PDU).

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

Severity warning

Facility LOG_DAEMON

Action Turn on the affected PDU manually.

CHASSISD_PDU_NOT_OK

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

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

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

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PEER_UNCONNECTED

System Log Message *function-name*: peer not connected

Description The chassis process (chassisd) processed a packet for a peer with an invalid or missing connection.

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

Severity error

Facility LOG_DAEMON

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

CHASSISD_PEM_BREAKER_TRIP

System Log Message Circuit breaker tripped for power supply *pem-slot*

Description The circuit breaker was tripped for the indicated power entry module (PEM).

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

Severity warning

Facility LOG_DAEMON

Action Turn on the affected PEM manually.

CHASSISD_PEM_IMPROPER

System Log Message Power supply *pem-slot* improper for platform

Description Old PEM is not supported in this platform.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Replace old PEM with proper newer PEM

CHASSISD_PEM_INPUT_BAD

System Log Message *error-message* for power supply *pem-slot* (status bits: 0x*status-code*); check circuit breaker

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

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

Severity warning

Facility LOG_DAEMON

Action Check the status of the circuit breaker and the input connections.

CHASSISD_PEM_NOT_SUFFICIENT

System Log Message Unable to power up FPC *fpc-slot*, because no three-input 240-A power supply is installed

Description On the T1600 router, the T1600-FPC4 ES Flexible PIC Concentrator (FPC) requires that at least one three-input 240-A power supply be installed. The chassis process (chassisd) did not power on the T1600-FPC4 ES in the indicated slot because the required power supply is not installed.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Install at least one three-input 240-A power supply.

CHASSISD_PEM_OVERLOAD

System Log Message Overload condition for power supply *pem-slot* (status bits: 0x*status-code*);

Description The indicated power entry module (PEM) reported an output voltage overload condition.

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

Severity warning

Facility LOG_DAEMON

Cause There might have been excessive load on the PEM.

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18834.

CHASSISD_PEM_TEMPERATURE

System Log Message Temperature check bit set for power supply *pem-slot*; airflow might be inadequate

Description The chassis process (chassisd) detected that the 'temperature check bit' was set in the status bit mask for the indicated power entry module (PEM).

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

Severity warning

Facility LOG_DAEMON

Cause The PEM might have exceeded its temperature threshold, possibly because the airflow through it was inadequate.

CHASSISD_PEM_VOLTAGE

System Log Message Power supply *pem-slot* reports problem; check output voltage

Description The indicated power entry module (PEM) reported a problem with its output voltage.

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

Severity warning

Facility LOG_DAEMON

Cause There might have been excessive load on the PEM.

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18835.

CHASSISD_PFE_LAUNCH_ERROR

System Log Message Failed to launch PFE: *error-message*

Description The chassis process (chassisd) failed to launch the PFE image.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_PIC_CMD_GIVEUP

System Log Message *function-name*: attempt *fpc-slot* to bring PIC *pic-slot* in FPC *count* online timed out; stopped trying

Description The chassis process (chassisd) tried the indicated number of times to bring the indicated PIC online, but stopped trying after all attempts failed.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PIC_CMD_TIMEOUT

System Log Message *function-name*: attempt to bring PIC *pic-slot* in FPC *fpc-slot* online timed out

Description The chassis process (chassisd) tried to bring the indicated Physical Interface Card (PIC) online. The attempt took longer than the standard time allotted for that operation.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PIC_CONFIG_CONFLICT

System Log Message fpc *pic-slot* pic *fpc-slot* port mirror instance *instance* will be applied to both the PICs

Description The PIC configuration will be alpplied to all PICs on the FPC

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

Severity unknown

Facility LOG_DAEMON

CHASSISD_PIC_CONFIG_ERROR

System Log Message Unable to create interface devices during attachment of PIC *pic-slot* in FPC *fpc-slot*: graceful switchover not supported

Description The chassis process (chassisd) did not create an interface device for the indicated PIC because graceful switchover was enabled but is not supported in combination with that PIC type. A PIC must have an interface device to come online, so it remained offline.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Remove the PIC or upgrade the Junos OS.

CHASSISD_PIC_HWERROR

System Log Message PIC *pic-slot* in FPC *fpc-slot* (PIC type *pic-type*, version *version*) had hardware error

Description The indicated PIC experienced a hardware error. The chassis process (chassisd) did not bring the PIC online.

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

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18836.

CHASSISD_PIC_OFFLINE_NOTICE

System Log Message Taking PIC *pic-slot* in FPC *fpc-slot* offline: *reason*

Description The chassis process (chassisd) took the indicated Physical Interface Card (PIC) offline, for the indicated reason.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_PIC_OID_GEN_FAILED

System Log Message Unable to generate OID for PIC: *pic-name* (*error-message*)

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PIC_OID_UNKNOWN

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PIC_PORT_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_PIC_RESET_ON_SWITCHOVER

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

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

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

Severity warning

Facility LOG_DAEMON

CHASSISD_PIC_SPEED_INVALID

System Log Message Set speed for so-*fpc-slot*/*pic-slot*/*port* to *default-value* because configured value *current-value* is invalid

Description The chassis process (chassisd) set the speed for the indicated Physical Interface Card (PIC) to the indicated value, because the configured value is either higher than the maximum valid value or lower than the minimum valid value.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Reconfigure the PIC with a valid speed.

CHASSISD_PIC_VERSION_ERROR

System Log Message Hardware version (*pic-slot*) of PIC *fpc-slot* in FPC *pic-type* (PIC type *version*) is not supported

Description The chassis process (chassisd) did not bring the indicated Physical Interface Card (PIC) online, because its hardware version is not supported.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Cause The PIC requires a hardware upgrade.

Action Contact your technical support representative.

CHASSISD_PIDFILE_OPEN

System Log Message Unable to open PID file '*filename*': errno *error-code*

Description The chassis process (chassisd) could not open the file where it stores its process ID (PID).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause The chassisd process might have detected that another chassisd process was running and tried to read the file so that it could use the PID recorded there when terminating the other process.

CHASSISD_POWER_CHECK

System Log Message *fru-name fru-slot* not powering up

Description The chassis process (chassisd) could not power up the indicated component (field-replaceable unit, or FRU), because the FRU did not respond.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_POWER_EVENT

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

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

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

Severity warning

Facility LOG_DAEMON

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

CHASSISD_POWER_ON_CHECK_FAILURE

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_POWER_RATINGS_EXCEEDED

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_PSD_RELEASE_MASTERSHIP

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

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

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

Severity notice

Facility LOG_DAEMON

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

CHASSISD_PSM_NOT_OK

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

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

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

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PSM_NOT_OK_1

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

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

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

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PSM_TRIP

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

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

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

Severity warning

Facility LOG_DAEMON

CHASSISD_PSU_ERROR

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

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

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

Severity warning

Facility LOG_DAEMON

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

CHASSISD_PSU_FAN_FAIL

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

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

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

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

CHASSISD_PSU_INPUT_BAD

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

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

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

Severity warning

Facility LOG_DAEMON

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

CHASSISD_PSU_OVERLOAD

System Log Message Overload condition for power supply *pem-slot* (status bits: 0x*status-code*);

Description The indicated power supply unit (PSU) reported an output voltage overload condition.

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

Severity warning

Facility LOG_DAEMON

Cause There might have been excessive load on the PSU.

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18841.

CHASSISD_PSU_TEMPERATURE

System Log Message Temperature check bit set for power supply *pem-slot*; airflow might be inadequate

Description The chassis process (chassisd) detected that the 'temperature check bit' was set in the status bit mask for the indicated power supply unit (PSU).

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

Severity warning

Facility LOG_DAEMON

Cause The PSU might have exceeded its temperature threshold, possibly because the airflow through it was inadequate.

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18842.

CHASSISD_PSU_VOLTAGE

System Log Message Power supply *pem-slot* reports problem; check output voltage

Description The indicated power supply unit (PSU) reported a problem with its output voltage.

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

Severity warning

Facility LOG_DAEMON

Cause There might have been excessive load on the PSU.

Action For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18843.

CHASSISD_RANGE_CHECK

System Log Message *function-name*: '0x*value*' is invalid value for *object-name* (out of range)

Description The indicated value was outside the valid range of values for the indicated object.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_RECONNECT_SUCCESSFUL

System Log Message Successfully reconnected on soft restart

Description The chassis process (chassisd) successfully reconnected with each Packet Forwarding Engine after a soft restart.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_RELEASE_MASTERSHIP

System Log Message Release mastership notification

Description The chassis process (chassisd) running on the master Routing Engine received a request to release mastership.

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

Severity info

Facility LOG_DAEMON

Cause The Routing Engine was probably rebooting and graceful Routing Engine switchover is configured.

CHASSISD_RE_CONSOLE_FE_STORM

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_RE_CONSOLE_ME_STORM

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_RE_INIT_INVALID_RE_SLOT

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_RE_OVER_TEMP_CONDITION

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_RE_OVER_TEMP_SHUTDOWN

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

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

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18845.

CHASSISD_RE_OVER_TEMP_WARNING

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18846.

CHASSISD_RE_WARM_TEMP_CONDITION

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

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

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

Severity error

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis.

CHASSISD_ROOT_MOUNT_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_RTS_SEQ_ERROR

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

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

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

Severity warning

Facility LOG_DAEMON

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

CHASSISD_SBOARD_VERSION_MISMATCH

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

Action Upgrade the software and reboot the routing platform.

CHASSISD_SENSOR_RANGE_NOTICE

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

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

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

Severity warning

Facility LOG_DAEMON

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

CHASSISD_SERIAL_ID

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

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

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

CHASSISD_SFM_MODE_ERROR

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

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

Type Error: An error occurred

Severity info

Facility LOG_DAEMON

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

CHASSISD_SFM_NOT_ONLINE

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_SHUTDOWN_NOTICE

System Log Message Shutdown reason: *reason*

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

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

Severity warning

Facility LOG_DAEMON

CHASSISD_SIB_INVALID_SLOT

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_SIGPIPE

System Log Message SIGPIPE received

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

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

Severity info

Facility LOG_DAEMON

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

CHASSISD_SMB_ERROR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_SMB_INVALID_PS

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

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

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

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

CHASSISD_SMB_IOCTL_FAILURE

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_SMB_READ_FAILURE

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_SNMP_TRAP1

System Log Message SNMP trap generated: *trap* (*argument1 value1*)

Description The chassisd process (chassisd) generated the indicated simple network management protocol (snmp) trap with the indicated value.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_SNMP_TRAP10

System Log Message SNMP trap generated: *trap* (*argument1 value1*, *argument2 value2*, *argument3 value3*, *argument4 value4*, *argument5 value5*, *argument6 value6*, *argument7 value7*, *argument8 value8*, *argument9 value9*, *argument10 value10*)

Description The chassis process (chassisd) generated a Simple Network Management Protocol (SNMP) trap with the ten indicated argument-value pairs.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_SNMP_TRAP6

System Log Message SNMP trap generated: *trap* (*argument1 value1*, *argument2 value2*, *argument3 value3*, *argument4 value4*, *argument5 value5*, *argument6 value6*)

Description The chassis process (chassisd) generated a Simple Network Management Protocol (SNMP) trap with the six indicated argument-value pairs.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_SNMP_TRAP7

System Log Message SNMP trap generated: *trap* (*argument1 value1*, *argument2 value2*, *argument3 value3*, *argument4 value4*, *argument5 value5*, *argument6 value6*, *argument7 value7*)

Description The chassis process (chassisd) generated a Simple Network Management Protocol (SNMP) trap with the seven indicated argument-value pairs.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_SPI_IOCTL_FAILURE

System Log Message *function-name*: *reason* 0x*address*, error *error-message*

Description The chassis process (chassisd) could not perform the indicated ioctl() operation on the indicated register of the spi device.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_SPMB_RESTART

System Log Message SPMB *slot* restarted

Description The indicated Switch Processor Mezzanine Board (SPMB) restarted.

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

Severity info

Facility LOG_DAEMON

CHASSISD_SPMB_RESTART_TIMEOUT

System Log Message Attempt *count* to restart SPMB *slot* timed out; *action*

Description The chassis process (chassisd) tried the indicated number of times to bring the indicated Switch Processor Mezzanine Board (SPMB) online. The chassisd process performed the indicated action as a result of the failure.

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

Severity error

Facility LOG_DAEMON

CHASSISD_SSB_FAILOVERS

System Log Message *fru-name* failover occurred *count* times

Description The indicated packet-switching component or control board failed over to a redundant neighbor the indicated number of times, which exceeds the maximum limit.

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

Severity warning

Facility LOG_DAEMON

Cause There is probably a system error.

Action Contact your technical support representative.

CHASSISD_STANDALONE_FPC_NOTICE

System Log Message chassisd running in standalone FPC mode *mode*

Description The chassis process (chassisd) was running in the indicated standalone Flexible PIC Concentrator (FPC) mode. This message was logged in case the administrator wants it to run in a different mode.

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

Severity warning

Facility LOG_DAEMON

CHASSISD_SYSCTL_ERROR

System Log Message *function-name*: *sysctl-error* error from *sysctl-function-name*: *error-message* (errno *error-code*)

Description The chassis process (chassisd) received the indicated error from the indicated sysctl() operation.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_TEMP_HOT_NOTICE

System Log Message *fru-name* temperature of *temperature* degrees C is above limit (*threshold* degrees)

Description The temperature of the chassis, or of the indicated component (field-replaceable unit, or FRU), exceeded the lower of two thresholds. The chassis process (chassisd) increased the speed of all functioning fans (and impellers, if applicable) to full speed. If the temperature did not decrease below the threshold within 4 minutes after this message was logged, the chassisd process shut down the routing platform.

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

Severity error

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis.

CHASSISD_TEMP_SENSOR_FAILURE

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18852.

CHASSISD_TERM_SIGNAL

System Log Message Received SIGTERM request, shutting down

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

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

Severity info

Facility LOG_DAEMON

CHASSISD_TIMER_CLR_ERR

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_TIMER_ERR

System Log Message Unable to schedule timeout for *description*

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_TIMER_VAL_ERR

System Log Message Null timer ID

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_UNEXPECTED_EXIT

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

CHASSISD_UNEXPECTED_VALUE

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

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

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_UNSUPPORTED_FPC

System Log Message FPC with I2C ID of 0x*i2c-id* is not supported

Description A Flexible PIC Concentrator (FPC) of the indicated type was installed in the routing platform. The software does not support that FPC type on this platform.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_UNSUPPORTED_MODEL

System Log Message Model *model* unsupported with this version of chassisd

Description The version of the chassis process (chassisd) software that is installed on the routing platform does not support this type of chassis.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_UNSUPPORTED_PIC

System Log Message PIC *pic-slot* in FPC *fpc-slot* (type *pic-type*, version *version*) is not supported

Description The indicated Physical Interface Card (PIC) is either not supported on this routing platform or is not supported by the installed version of the chassis process (chassisd) software. The chassisd process did not bring the PIC online.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_UNSUPPORTED_PIC_MODE

System Log Message Application mode *mode* is not supported for PIC *pic-slot* in FPC *fpc-slot*

Description The indicated Physical Interface Card (PIC) does not support the indicated application mode configured for it.

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

Severity warning

Facility LOG_DAEMON

Action Check which application modes are supported for the PIC.

CHASSISD_UNSUPPORTED_SIB

System Log Message SIB with assembly ID *assembly-id* is not supported *reason*

Description The chassis process (chassisd) detected the presence of a new Switch Interface Board (SIB) with the indicated assembly ID. The SIB remains offline, because it is not a supported type.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_VCHASSIS_CONVERT_ERROR

System Log Message *function-name*: *fpc-slot/pic-slot/port* conversion timeout; type *type-string*

Description The chassis process (chassisd) timed out awaiting notification from an fpc that an interface being converted to or from a vc-port was deleted.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_VCHASSIS_LICENSE_ERROR

System Log Message Virtual Chassis License not installed

Description A virtual-chassis operational mode command was executed without a valid virtual chassis license being installed.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_VERSION_MISMATCH

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

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

Action Upgrade the software and reboot the routing platform.

CHASSISD_VOLTAGE_READ_FAILED

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

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

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18855.

CHASSISD_VOLTAGE_SENSOR_INIT

System Log Message Unable to initialize voltage sensor for *fru-name* (group *group-id*, address *address*)

Description The chassis process (chassisd) could not initialize the voltage sensor for the indicated component (field-replaceable unit, for FRU).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_VSERIES_LICENSE_ERROR

System Log Message CHASSISD_VSERIES_LICENSE_ERROR: *error-message*

Description A virtual Appliance Operational Command was executed without a valid virtual appliance license being installed.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_ZONE_BLOWERS_SPEED

System Log Message Fans and impellers in zone *zone* are now running at normal speed

Description The fans (and impellers, if applicable) in zone were running at the normal speed.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_ZONE_BLOWERS_SPEED_FULL

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

Description For the indicated reason, the chassis process (chassisd) increased the speed of fans (and impellers, if applicable) in zone to the maximum.

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

Severity notice

Facility LOG_DAEMON

CHASSISD_ZONE_BLOWERS_SPEED_OFF

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

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

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

Severity notice

Facility LOG_DAEMON

CHAPTER 2

Router Chassis Clocking and Synchronization Configuration Overview

Centralized Clocking Overview

Starting with Junos OS Release 12.2, the Enhanced SCB—SCBE—and from Junos OS Release 13.3, the Enhanced SCB—SCBE2—on the MX240, MX480, and MX960 routers support a Stratum 3 clock module that functions as a centralized point within the chassis for clock monitoring, filtering, holdover, and selection.

The Stratum 3 clock module produces a 19.44 MHz clock that is locked to a chassis synchronization clock source that is configured with the highest quality. The chassis clock signals are transmitted through the backplane to all the MPCs. The MPCs route the clock signals to their MICs, where the clock signals are driven out on all line interfaces thereby allowing the timing information to be distributed to the downstream routers.

You can configure external and line input synchronization sources at the **[edit chassis synchronization output]** hierarchy level, at the **[edit chassis synchronization source interfaces]** hierarchy level, and at the **[edit chassis synchronization interfaces]** hierarchy level, that become candidates to be selected by the chassis's clock selection algorithm. The clock selection algorithm selects the highest-quality candidate clock source, which is then used as the chassis's synchronization source.

The external clock interface on SCBE allows building-integrated timing supply (BITS) or global positioning system (GPS) clock sources to act as an input clock source to the centralized timing circuit, or allows the centralized timing signals to act as an output clock source to the BITS source or to the GPS source.

The centralized mode is applicable to mobile backhaul infrastructures and for network transition from traditional TDM to Ethernet network elements with the support of Synchronous Ethernet.

Points to remember:

- Before you begin configuring centralized clocking on an interface that uses Synchronous Ethernet, ensure that you have configured the interface as a chassis synchronization source to the router that provides a Synchronous Ethernet clock source.
- Before you remove the SCBE from the router, you must delete the configuration under the **[edit chassis synchronization]** configuration command. Similarly, before you remove the SCBE2 from the router, you must delete the configuration under the **[edit chassis synchronization]** configuration command.
- On SCBE2, the external-0/0 interface is located on **SCB0** and the external-1/0 interface is located on **SCB1**.

The following sections explain centralized clocking and its features in detail:

NOTE: Hereafter, all features that are explained for SCBE are also applicable for SCBE2 unless otherwise specified.

- Stratum 3 Clock Module on page 127
- BITS and GPS Support on page 127
- External Clock Interface Input on page 127
- External Clock Interface Output on page 128
- Redundancy on page 129

Stratum 3 Clock Module

SCBE has a Stratum 3 centralized clock module that takes in synchronization sources on its reference input pins. When instructed by the clock selection algorithm, the clock module selects one of the reference inputs to lock its 19.44 MHz output clock. The MPCs select the chassis clock from the active SCBE to use it as a clock for their interface transmitters, thereby allowing the downstream routers to recover and synchronize to the chassis clock. A 20 MHz oscillator provides Stratum 3 free-run and holdover quality.

The clock module does not do any automatic switching between the reference clocks, rather when Junos OS detects the loss of signal or clock, frequency inaccuracy, or phase irregularities, the clock module runs a clock selection algorithm and switches to the next highest-quality input reference.

The Stratum 3 clock modules—on the master and the backup SCBE—are cross-wired to eliminate any phase transients during SCBE switchover. The backup SCBE locks to the master's Stratum 3 clock module.

BITS and GPS Support

Table 6 on page 127 maps the Junos OS Release with the feature release of BITS and GPS on SCBE and SCBE2:

Table 6: BITS and GPS Support on SCBE and SCBE2

Feature	Switch Control Board	Junos OS Release
BITS	SCBE	12.3
GPS	SCBE	13.3
BITS	SCBE2	13.3

External Clock Interface Input

BITS and GPS can be configured on the external clock interface on the SCBE.

The external clock interface for BITS can recover:

- A framed 1.544 Mbps (T1) clock or a framed 2.048 Mbps (E1) clock. The T1/E1 framer supports sending and receiving of SSM quality levels through SA bits.
- An unframed 2048 kHz (G.703 T12) clock. You must configure an input SSM quality level when the external clock interface is configured for a signal type that does not support SSM, such as unframed 2048 kHz (T12) clock, or T1 superframe (T1 SF) clock.

On T1/T12 interfaces that do not support SSM, you must configure the SSM quality levels. On E1 interfaces, the Sa bits receive and transmit the SSM quality level.

The following sections explain external clock interface input for BITS and GPS:

- External Clock Interface Input for BITS on page 128
- External Clock Interface Input for GPS on page 128

External Clock Interface Input for BITS

When the BITS clock is qualified by the Stratum 3 clock module, it becomes a candidate clock source to the clock selection algorithm. BITS can simultaneously support both input and output clocking.

External Clock Interface Input for GPS

The GPS external clock interface supports:

- 1 MHz, 5 MHz, and 10 MHz frequencies.
- Pulse per second (PPS) signals on BNC connectors—a special cable converts signals between the BNC connector and the RJ45 port. These signals are fed into the Stratum 3 centralized clock module for qualification and monitoring. After qualification, the GPS source becomes a valid chassis clock source candidate.
- Time of day (TOD) over a serial link. Most GPS source TOD string formats are supported by Junos OS thereby enabling you to configure a generic TOD format string. This format tells the Routing Engine how to interpret the incoming TOD character string.

You must also configure an input SSM quality level value, where the quality level is used by the chassis clock selection algorithm when the quality level mode is enabled. For the GPS input clock to be qualified, the frequency and the PPS signal must be qualified by the SCBE Stratum 3 module and the SCBE must be synchronized with the GPS source TOD.

External Clock Interface Output

The external clock interface can be configured to drive BITS or GPS timing output (GPS timing output for frequency and PPS signal only). The BITS or GPS output is configured to select the output clock source but in the absence of an output configuration, the BITS or the GPS output is disabled. When the external clock interface is configured for output, it selects the clock source on the basis of the configured source mode.

When the external clock interface is configured as a BITS timing output, the following scenarios occur:

- The external clock interface drives the BITS timing output.

  The chassis clock or the line clock are used as the source on the basis of the source mode configuration.

  The best—configured—line source is transmitted out the BITS interface, when the output **source-mode** statement is configured as line.

  The central clock module is set to holdover and the output is suppressed when the BITS output is configured and there are no valid clock sources available.

Redundancy

On SCBE, the primary and the secondary SCBs monitor their respective clock sources, and the external clock interface source is accessible only to its local clocking hardware. Therefore, the clock signals cannot be routed between the primary and the secondary SCB. Redundancy is achieved after a Routing Engine switchover. When a switchover occurs, the new primary SCB reruns the clock selection algorithm after the configured switchover time expires to select a new clock source.

On SCBE2, simultaneous BITS/BITS redundancy can be achieved because the external interfaces for BITS on the primary SCB and the secondary SCB are wired. Note that BITS redundancy is achieved without a Routing Engine switchover on SCBE2.

The following scenarios are supported for BITS/BITS redundancy:

- You can configure both the external interfaces for BITS input as reference clocks. Therefore, on the basis of the configured clock quality, one of the BITS inputs is considered as a primary clock source and the other as a secondary clock source.
- When the signal from the primary BITS input stops or degrades, the secondary BITS input takes over as primary, thereby providing redundancy across BITS interfaces.

GRES is supported on MX240, MX480, and MX960 routers with SCBE2.

Related Documentation

- Configuring Clock Synchronization Interface on MX Series Routers on page 309
- Example: Configuring Synchronous Ethernet on MX Series Routers on page 320
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 324
- **request chassis synchronization mode on page 670**
- **show chassis synchronization (MX Series Routers) on page 1550**
- **synchronization on page 581**
- Understanding Clock Synchronization on MX Series Routers on page 145

Ethernet Synchronization Message Channel Overview

Ethernet Synchronization Message Channel (ESMC) is a logical communication channel. It transmits Synchronization Status Message (SSM) information, which is the quality level of the transmitting synchronous Ethernet equipment clock (EEC), by using ESMC protocol data units (PDUs). ESMC support is based on the ITU G.8264 specification.

A Synchronous Ethernet interface is configured to operate in the following modes:

- Nonsynchronous mode—In this mode, the Synchronous Ethernet interface does not process the ESMC message and does not extract the quality level information.
- Synchronous mode—In this mode, the Synchronous Ethernet interface processes the ESMC message and extracts the quality level information. While operating in synchronous mode, the ESMC messages transmit the quality level.

You can enable ESMC on a Synchronous Ethernet port by adding the port to a list of ESMC interfaces. The ESMC messages are transmitted through the port indicating the quality level of the clock it is capable of driving and the ESMC messages are received (if the other endpoint supports ESMC) with the quality level of the transmitting clock. The MPC receiving the ESMC messages on its configured Synchronous Ethernet ports extracts the quality level and transmits it to the Routing Engine. The clock selection algorithm on the Routing Engine collects the ESMC data from each of the ESMC-enabled ports to select the clock sources.

The clock selection process supports revertive and nonrevertive modes. When the clock selection process has selected two clock sources—a primary and a secondary—and the active primary clock source degrades over a period of time and then improves again, this primary clock source again becomes the active clock source only if revertive mode is enabled. If nonrevertive mode is set and the secondary clock source is currently active (due to a previous degradation of primary clock source), the primary clock source is not reactivated even after its quality improves.

The clock selection is based on the following three operational modes:

- Forced free-run—In this mode, you can set the clock source either from a free-run local oscillator or from an external qualified clock. For MX80 routers, the free-run clock is provided by the local oscillator. For MX240, MX480, and MX960 routers, the free-run clock is provided by the Switching Control Board (SCB).
- Forced holdover—This mode is an internal state the synchronous Ethernet Equipment Clock (EEC) goes into, when an upstream clock source that the system locks on to is no longer available. You cannot configure this mode because it is an internal state.
- Automatic selection—In this mode, the system chooses up to two best upstream clock sources. The system then uses the clock recovered from one of the sources to generate a frequency of 19.44 MHz and clock the transmit side of the Ethernet interfaces. If no upstream clock with acceptable good quality is available or if the system is configured in free-run mode, the system uses the internal clock. Automatic clock selection is based on the quality level, priority, signal fail, and external commands.

For more information about clock selection, see "Configuring Clock Synchronization Interface on MX Series Routers" on page 309.

The synchronous EEC is in free-run mode when the chassis is switched on or restarted. When a synchronous EEC locks on to an upstream reference clock source at least once for a continuous period of 60 seconds, the EEC will have stored sufficient Synchronous Ethernet data in a replay holdover buffer. In case of failure of a reference clock source, the system goes to holdover mode and uses the replay data in the holdover buffer to service the downstream Synchronous Ethernet clients.

When a Modular Port Concentrator (MPC) with an EEC restarts (because of either a system crash or a manual restart), the holdover buffer data gets erased. Therefore, downstream Synchronous Ethernet clients cannot be serviced. This is also applicable when a new MPC containing an EEC is inserted into the system.

In a practical deployment scenario, the status display of holdover mode is invalid only when the chassis is switched on or restarted.

When an MPC containing an EEC is restarted or a new MPC containing an EEC is inserted into a system that is (already) in holdover mode, the EEC on this MPC cannot be considered to be in holdover mode because it does not have any Synchronous Ethernet replay information in its holdover data buffer. Therefore, you must first fix the system holdover issue before attempting to service the downstream Synchronous Ethernet clients on this MPC. To accomplish this, you must find a suitable upstream reference clock source and let the synchronous EEC lock on to this upstream reference clock source, and then service the downstream Synchronous Ethernet clients on this MPC.

Related Documentation

- Synchronous Ethernet Overview on page 133
- Configuring Clock Synchronization Interface on MX Series Routers on page 309
- Clock Sources for PTX Series Packet Transport Routers on page 317
- **synchronization on page 581**
- **request chassis synchronization mode on page 670**
- **show chassis synchronization on page 1546**

Interface and Router Clock Sources Overview

Interface and Router Clock Sources Description

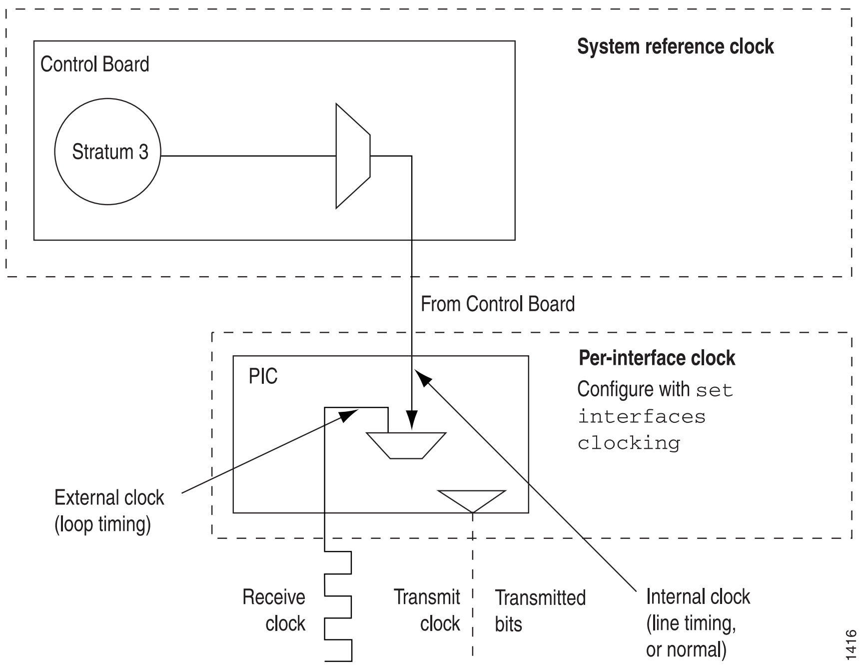
When configuring the router, you can configure the *transmit clock* on each interface; the transmit clock aligns each outgoing packet transmitted over the router's interfaces. For both the router and interfaces, the clock source can be the router's internal Stratum 3 clock, which resides on the control 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 132 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 307.

Related Documentation

- Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 307
- Synchronous Ethernet Overview on page 133
- Configuring Clock Synchronization Interface on MX Series Routers on page 309

Synchronous Ethernet Overview

Synchronous Ethernet (ITU-T G.8261 and ITU-T G.8264) is a physical layer technology that functions regardless of the network load and supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet. It enables you to deliver synchronization services that meet the requirements of the present-day mobile network, as well as future Long Term Evolution (LTE)–based infrastructures.

The following sections explain Synchronous Ethernet in detail:

Understanding Synchronous Ethernet

Synchronization is a key requirement for circuit (emulation) services and mobile radio access technologies. Traditionally, mobile networks used SONET/SDH technologies to backhaul voice and data traffic, and the native support for frequency of SONET/SDH to synchronize their radio network. With the need for greater-capacity backhaul networks, packet-based technologies such as Carrier Ethernet (which do not support the transfer of frequency), and wireless technologies such as frequency division duplex and time-division duplex require not only frequency synchronization but also proper time and phase alignment. This requirement is fulfilled by Synchronous Ethernet, which is used for physical layer frequency synchronization of connected access devices (such as base stations, access nodes, and so on). Synchronous Ethernet supports sourcing and transfer of frequency for synchronization purposes for both wireless and wireline services and is primarily used for mobile backhaul and converged transport.

Synchronous Ethernet is not supported in the following instances on MX Series router:

- Slot 10 on an MX Series router with Switch Control Board (SCB).
- RJ45 ports

However, note that Synchronous Ethernet is supported on slot 10 on an MX Series router with SCBE and SCBE2.

NOTE: Unified in-service software upgrade (unified ISSU) is currently not supported when clock synchronization is configured for Synchronous Ethernet on MX80 3D Universal Edge routers and on the MICs and MPCEs on MX240, MX480, and MX960 routers.

Supported Platforms

Table 7 on page 134 summarizes the first Junos OS release that supports Synchronous Ethernet on the various Juniper Networks routers and their components:

Table 7: Synchronous Ethernet Support on Junos OS

Routers and Components	Junos OS Release
MX5, MX10, MX40, and MX80 3D Universal Edge Routers with model numbers MX5-T, MX10-T, MX40-T, and MX80-T	11.2R4
10-Gigabit Ethernet MPC with SFP+ transceivers	11.2R4
10-Gigabit Ethernet MIC with XFP in WAN-PHY framing mode	11.2R4
On MX240, MX480, and MX960 routers, the following Enhanced MPCs (MPCEs) support Synchronous Ethernet: • MPC1E (MX-MPC1E-3D) • MPC1E Q (MX-MPC1E-3D-Q) • MPC2E (MX-MPC2E-3D) • MPC2E Q (MX-MPC2E-3D-Q) • MPC2E EQ (MX-MPC2E-3D-EQ)	11.2R4
10-Gigabit Ethernet MIC with XFP in LAN-PHY framing mode	11.4
Juniper Networks PTX Series Packet Transport Switches with their 10-Gigabit Ethernet, 40-Gigabit Ethernet, and 100-Gigabit Ethernet interfaces	12.1
Juniper Networks ACX2000 Series Universal Access routers with Gigabit Ethernet and 10-Gigabit Ethernet SFP and SFP+ transceivers.	12.2

Table 7: Synchronous Ethernet Support on Junos OS *(continued)*

<table>
<tr><th>Routers and Components</th><th>Junos OS Release</th></tr>
<tr><td>On MX240, MX480, and MX960 routers with SCBE, the following MPCs support Synchronous Ethernet:
<table>
<tr><th>MPC</th><th>Junos OS Release</th></tr>
<tr><td>MPC-3D-16XGE-SFP</td><td>12.3</td></tr>
<tr><td>MPC4E-3D-32XGE-SFPP</td><td>15.1</td></tr>
<tr><td>MPC4E-3D-2CGE-8XGE</td><td>15.1</td></tr>
<tr><td>MX-MPC1-3D</td><td>12.3</td></tr>
<tr><td>MX-MPC1-3D-Q</td><td>12.3</td></tr>
<tr><td>MX-MPC2-3D</td><td>12.3</td></tr>
<tr><td>MX-MPC2-3D-Q</td><td>12.3</td></tr>
<tr><td>MX-MPC2-3D-EQ</td><td>12.3</td></tr>
</table>
</td><td>12.3, 15.1</td></tr>
<tr><td>MPC3E (MX-MPC3E-3D) on MX240, MX480, and MX960 routers</td><td>13.2</td></tr>
<tr><td>MX104 router</td><td>13.2R2</td></tr>
<tr><td>On MX2010 and MX2020 routers, the following Enhanced MPCs (MPCEs) support Synchronous Ethernet:
• MPC1E (MX-MPC1E-3D)
• MPC1E Q (MX-MPC1E-3D-Q)
• MPC2E (MX-MPC2E-3D)
• MPC2E Q (MX-MPC2E-3D-Q)
• MPC2E EQ (MX-MPC2E-3D-EQ)
• MPC3E (MX-MPC3E-3D)</td><td>13.3</td></tr>
</table>

Table 7: Synchronous Ethernet Support on Junos OS *(continued)*

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

MPC	Junos OS Release
MPC-3D-16XGE-SFP	13.3
MPC4E-3D-32XGE-SFPP	15.1
MPC4E-3D-2CGE-8XGE	15.1
MX-MPC1-3D	13.3
MX-MPC1-3D-Q	13.3
MX-MPC2-3D	13.3
MX-MPC2-3D-Q	13.3
MX-MPC2-3D-EQ	13.3

Starting with Junos OS Release 12.1, Synchronous Ethernet is supported on Juniper Networks PTX Series Packet Transport Routers. On the packet transport routers, Synchronous Ethernet is supported on 10-Gigabit Ethernet, 40-Gigabit Ethernet, and 100-Gigabit Ethernet interfaces and is compliant with ITU-T G.8261 and ITU-T G.8262 standards.

Starting with Junos OS Release 12.2, Synchronous Ethernet is supported on Juniper Networks ACX Series Universal Access routers with Gigabit Ethernet and 10-Gigabit Ethernet SFP and SFP+ transceivers and is compliant with the ITU-T G.8261 and G.8264 standards.

The 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet, which requires both the MIC and the interface to be configured in LAN framing mode. In LAN mode, the LAN frequency is directly supplied by the MIC's on-board clocking circuitry.

Understanding Clock Synchronization

MX Series routers support external clock synchronization and automatic clock selection for Synchronous Ethernet, T1 or E1 line timing sources, and external inputs.

Configuring external clock synchronization and automatic clock selection requires making clock selection, quality level, and priority considerations. The clock source selection algorithm is used to pick the two best upstream clock sources from among the various sources on the basis of system configuration and execution criteria such as quality level, priority, and hardware restrictions.

You can configure several options for external clock synchronization. For an overview about the configuration options, see "Configuring Clock Synchronization Interface on MX Series Routers" on page 309 and for information about configuring these options for MX Series routers, see "Understanding Clock Synchronization on MX Series Routers" on page 145.

Currently, two types of clocking modes are supported on MX Series routers, the distributing clocking mode and the centralized clocking mode. For information about distributed clocking mode, see "Distributed Clocking Mode Overview" on page 137 and "Ethernet Synchronization Message Channel Overview" on page 130. For information about centralized clocking mode, see "Centralized Clocking Mode Overview" on page 138 and "Centralized Clocking Overview" on page 126.

Ingress Monitoring Overview

The ingress clock monitoring feature is supported on all MX Series routers including the 16-port 10-Gigabit Ethernet MPC. On these routers, the incoming Synchronous Ethernet signals cannot be monitored on the 16-port 10-Gigabit Ethernet MPC but are monitored by other Modular Port Concentrators (MPCs) in the chassis. Therefore, you can use the 16-port 10-Gigabit Ethernet MPC for incoming Synchronous Ethernet signals if at least one other MPC with an Ethernet Equipment Clock (EEC) is present in the chassis. This behavior is referred to as *ingress clock monitoring*. Note that the 16-port 10-Gigabit Ethernet MPC does not have a built-in EEC or internal clock; therefore, it can only input (accept) a clock signal but cannot act as a clock source.

When an MX Series router is configured for Synchronous Ethernet on the 16-port 10-Gigabit Ethernet MPC and no other MPC with an EEC is present in the chassis, the Synchronous Ethernet feature cannot be supported by the system. The system notifies the user through log messages and CLI output and justifies its inability to support Synchronous Ethernet.

For information about Synchronous Ethernet support on the 10-Gigabit Ethernet MIC, see "Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview" on page 139.

Distributed Clocking Mode Overview

In the distributing clocking mode, the Switch Control Board (SCB) supports synchronizing the MX Series router's chassis to an internal Stratum 3 free-run oscillator. The Synchronous Ethernet timing messages are sent through the chassis to support the network timing trails that are traceable to a high-quality timing source. The timing messages are carried through the network by the Ethernet switches that were traditionally handled by time-division multiplexing (TDM) equipment over SONET/SDH interfaces. The distributing clocking mode is handled through Ethernet Synchronization Message Channel (ESMC) messages. The ESMC support is based on the ITU-G.8264 specification. The ESMC allows the propagation of Synchronization Status Message (SSM) information by using ESMC protocol data units (PDUs). For more information, see "Ethernet Synchronization Message Channel Overview" on page 130.

The distributed clocking mode has the following limitations:

- There is no SCB centralized clock module to synchronize the entire chassis.

- The recovered line timing is driven out only by the line interface of the 16-port 10-Gigabit Ethernet MPC.
- The distributed mode does not support external clock interface timing.

Centralized clocking mode overcomes these limitations by distributing and driving timing out on all the chassis line interfaces.

Centralized Clocking Mode Overview

Starting with Junos OS Release 12.2, the Enhanced SCB—SCBE—on the MX240, MX480, and MX960 routers supports a Stratum 3 clock module that functions as a centralized point within the chassis for clock monitoring, filtering, holdover, and selection. It has only one external clock interface. For more information, see “Centralized Clocking Overview” on page 126.

Starting from Junos OS Release 13.3, the Enhanced SCB—SCBE2—supports two external clock interfaces external-0/0 and external-1/0. The external-0/0 interface refers to the external interface on the SCB in slot 0 and the external 1/0 interface refers to the external interface on the SCB in slot 1.

NOTE: **On SCBE2, you can configure the external synchronization options only on the external interface on the active SCB. Therefore, if the active SCB is in slot 0, then you can configure the external-0/0 interface only. If the active SCB is in slot 1, then you can configure the external-1/0 interface only.**

The centralized mode is applicable to mobile backhaul infrastructures and for network transition from traditional TDM to Ethernet network elements with the support of Synchronous Ethernet.

Related Documentation

- Clock Sources for PTX Series Packet Transport Routers on page 317
- Configuring Clock Synchronization Interface on MX Series Routers on page 309
- *Configuring External Clock Synchronization for ACX Series Routers*
- Ethernet Synchronization Message Channel Overview on page 130
- Example: Configuring Synchronous Ethernet on MX Series Routers on page 320
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 324
- **request chassis synchronization mode on page 670**
- **show chassis synchronization (MX Series Routers) on page 1550**
- Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 139
- **synchronization on page 581**

Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview

Synchronous Ethernet (ITU-T G.8261) is a physical layer technology that functions regardless of the network load. Synchronous Ethernet supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet.

Starting with Junos OS Release 11.4, the 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet in LAN-PHY framing mode. This is possible only when all the Physical Interface Cards (PICs) under the given Modular Interface Card (MIC) and its ingress interfaces are configured in LAN framing mode. For more information about configuring LAN framing mode, see "Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC" on page 324. In this mode, the LAN frequency is directly supplied by the MIC's on-board clocking circuitry.

On MX80 3D Universal Edge Routers, when the PIC-level framing type is changed, the pluggable MIC (2-port 10-Gigabit Ethernet MIC with XFP) is restarted and the Forwarding Engine Board with the built-in MIC (4-port 10-Gigabit Ethernet MIC with XFP) is restarted.

On MX240, MX480, and MX960 routers, when the PIC-level framing type is changed from LAN mode to non-LAN mode (on a MIC), the entire MPC restarts.

NOTE: **The default interface framing mode is LAN-PHY framing mode. For WAN-PHY framing mode operation, interface framing needs to be set to the wan-phy framing option explicitly. For more information about the interface-level and PIC-level configuration combination, see** "Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC" on page 324.

Synchronous Ethernet is not supported in the following instances:

- MX240, MX480, and MX960 routers with 10-Gigabit Ethernet MICs or 10-Gigabit Ethernet built-in interfaces do not support Synchronous Ethernet or Ethernet Synchronization Message Channel (ESMC) transmit in LAN physical layer device (LAN-PHY) framing mode. To configure Synchronous Ethernet or ESMC transmit interfaces on these routers with 10-Gigabit Ethernet Interfaces, you must configure all the 10-Gigabit Ethernet interfaces on the MIC in WAN physical layer device (WAN PHY) framing mode.
- Primary and secondary sources cannot be from the same MIC. Alternatively, only the port with the highest quality clock source from a given MIC is used for clock selection.
- Starting with Junos OS Release 11.4, Synchronous Ethernet is not supported on 10-Gigabit Ethernet ports in LAN-PHY mode except for the 10-Gigabit Ethernet MIC with XFP.
- Prior to Junos OS Release 11.4, Synchronous Ethernet was supported only in WAN-PHY framing mode on the 10-Gigabit Ethernet MICs with XFP.

NOTE:

On the MX Series 3D Universal Edge Routers, the placement of MICs varies from router to router, the following key points has to be taken into consideration while configuring the MICs:

- On the fixed MX80 chassis, the MICs (10-Gigabit Ethernet MIC) come preinstalled and cannot be replaced. The MIC is labeled as 0/MIC 0 and it consists of four 10-Gigabit Ethernet ports labeled 0 through 3, left to right.
- On the modular MX5, MX10, MX40, and MX80 chassis, there are two MIC slots that are labeled as 1/MIC 0 and 1/MIC 1.
- On the MX240, MX480, and MX960 3D Universal Edge Routers, there are two slots for MICs which are labeled as PIC 0/1 and PIC 2/3 on the Modular Port Concentrators (MPCs).

Note that hereon the term *PIC* is being used in synonymous with the term *MIC slot* or *Ethernet ports* (in the case of fixed MX80 chassis).

You can configure a MIC in LAN-PHY framing mode by configuring all the constituent logical PICs in the same LAN-PHY framing mode on MX80, MX240, MX480, and MX960 routers.

You can also alternatively configure a MIC in WAN-PHY framing mode on MX80, MX240, MX480, and MX960 routers by configuring all the constituent logical PICs in the same WAN-PHY framing mode in any one of the following configurations:

- No framing mode configured on all the constituent logical PICs of the MIC.
- Incompatible framing mode configured on constituent logical PICs of the MIC.
- No framing mode configured on some of the constituent logical PICs of the MIC.

NOTE: All the logical PICs in a single MIC must be configured in the same framing mode.

You can also configure the framing mode at the interface level and at the PIC level. For more information about configuring the framing mode at the PIC level and at the interface level, see "Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC" on page 324.

When the PIC-level framing type is changed between LAN mode and non-LAN mode on a MIC:

- The Forwarding Engine Board (FEB) is restarted in the case of the built-in MIC (4-port 10-Gigabit Ethernet MIC with XFP) on MX80 routers.
- Only the corresponding MIC is restarted in the case of the pluggable MIC (2-port 10-Gigabit Ethernet MIC with XFP) on MX80 routers.

- The entire MPC restarts in the case of MX240, MX480, and MX960 routers.

NOTE: By default, the PIC-level framing mode is set to WAN framing type, that is, **e1 | e3 | sdh | sonet | t1 | t3**. Synchronous Ethernet works on the 10-Gigabit Ethernet MIC with XFP in LAN-PHY mode only when the PIC-level framing configuration is configured to the **lan** framing type explicitly.

By default, the interface-level framing mode is set to **lan-phy**. For WAN-PHY operation, interface framing needs to be set to **wan-phy** framing explicitly.

Table 8 on page 141 summarizes the possible configuration combination for Synchronous Ethernet on the 10-Gigabit Ethernet MIC with XFP that are available at the interface level and the PIC level:

Table 8: Configuration Options

Framing Configuration		Operation		
PIC Level	**Interface Level**	**Interface Status**	**Will Synchronous Ethernet Function?**	**Will Non-Synchronous Ethernet Functions Work?**
LAN	LAN-PHY (Default)	Up	Yes	Yes
LAN	WAN-PHY	Down (Framing Conflict)	No	No
WAN (Default)	LAN-PHY (Default)	Up	No	Yes
WAN (Default)	WAN-PHY	Up	Yes	Yes

The following cases and corresponding behaviors explain Table 8 on page 141 in detail.

- The PIC is being brought up online:

  This case is applicable when either the MIC is restarted or when the MIC is being brought online by an operational command. In this case, the behavior can be presented as:

  - No framing mode is configured for any or all of the constituent logical PICs of the MIC—The MIC is configured to operate in WAN-PHY framing mode as the WAN mode is the default mode.

    Here, the WAN-PHY framing-based interfaces operate in normal state and provides Synchronous Ethernet services. However, the LAN-PHY framing-based interfaces operate normally but cannot provide Synchronous Ethernet services.

  - All the constituent logical PICs of a MIC are configured in LAN-PHY mode—The MIC is configured to operate in LAN-PHY framing mode.

In this scenario, the WAN-PHY framing-based interfaces cannot operate in normal state. As a result, these interfaces are administratively brought down. The reason for the interface being in **admin-down** state is displayed as **Framing Conflict** in the output of the **show interfaces** operational command. This is because the interface framing configuration (WAN-PHY) is in conflict with the PIC-level framing configuration of LAN-PHY. Because the interfaces are in **admin-down** state, neither the Synchronous Ethernet services nor other services are provided.

Alternatively, all the LAN-PHY framing-based interfaces can operate in normal state and can continue to provide any of the Synchronous Ethernet services.

- The PIC is already online:
  - In WAN-PHY framing mode—The interface framing configuration on the PIC has changed from WAN-PHY to LAN-PHY.

    The interface continues to be operational for data transceiving purposes. However, it cannot provide any of the Synchronous Ethernet services.
  - In WAN-PHY framing mode—The interface framing configuration on the PIC has changed from LAN-PHY to WAN-PHY.

    The interface continues to be operational for data transceiving purposes, and it can also provide Synchronous Ethernet services.
  - In LAN-PHY framing mode—The interface framing configuration on the PIC has changed from WAN-PHY to LAN-PHY.

    The interface is operational for data transceiving purposes, and it can also provide Synchronous Ethernet services.
  - In LAN-PHY framing mode—The interface framing configuration on the PIC has changed from LAN-PHY to WAN-PHY.

    The interface is down; therefore, it cannot provide any Synchronous Ethernet services.

Support for Synchronous Ethernet is limited in the following instances:

- Primary and secondary sources cannot be from the same MIC. Alternatively, only the port with the highest quality clock source from a given MIC is used for clock selection.
- Prior to Junos OS Release 11.4, Synchronous Ethernet was supported only in WAN-PHY framing mode on the 10-Gigabit Ethernet MICs with XFP.

Related Documentation

- Clock Sources for PTX Series Packet Transport Routers on page 317
- Configuring Clock Synchronization Interface on MX Series Routers on page 309
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 324
- **request chassis synchronization mode on page 670**
- **show chassis synchronization (MX Series Routers) on page 1550**
- Synchronous Ethernet Overview on page 133

- synchronization on page 581

Precision Time Protocol Overview

Increase in bandwidth requirements on wireless backhaul networks and the need to reduce costs and to improve flexibility have triggered the need for a packet-based backhaul infrastructure. Traditional metro deployments do not cater to the delivery of synchronization services, and this leaves operators with no other choice than to keep older parallel infrastructure. Physical layer–based Synchronous Ethernet and packet-based Precision Time Protocol (PTP) enable routers and switches to deliver synchronization services that meet the requirements of today's mobile network, as well as future Long Term Evolution (LTE)–based infrastructures. Physical layer–based technologies function regardless of network load, whereas packet-based technologies require careful architecture and capacity planning. For information about Synchronous Ethernet, see “Synchronous Ethernet Overview” on page 133.

PTP, also known as IEEE 1588v2, is a packet-based technology that enables the operator to deliver synchronization services on packet-based mobile backhaul networks. IEEE 1588 PTP (Version 2) clock synchronization standard is a highly precise protocol for time synchronization that synchronizes clocks in a distributed system. The time synchronization is achieved through packets that are transmitted and received in a session between a master clock and a slave clock.

The system clocks can be categorized based on the role of the node in the network. They are broadly categorized into ordinary clocks and boundary clocks. The master clock and the slave clock are known as ordinary clocks. The boundary clock can operate as either a master clock or a slave clock. The following list explains these clocks in detail:

- Master clock—Also called the grandmaster clock, the master clock is located in the PTP server (also called master or master node). The master clock transmits the messages to the PTP clients (also called slave node or boundary node). This allows the clients to establish their relative time distance and offset from the master clock (which is the reference point) for phase synchronization. Delivery mechanism to the clients is either unicast or multicast packets over Ethernet or UDP.
- Slave clock—Located in the PTP client (also called slave or slave node), the slave clock performs clock and time recovery operations based on the received and requested timestamps from the master clock.
- Boundary clock—The boundary clock operates as a combination of the master and slave clocks. The boundary clock endpoint acts as a slave clock to the master clock, and also acts as the master to all the slaves reporting to the boundary endpoint.

For more information about configuring PTP, see “Configuring Precision Time Protocol” on page 327 and “Example: Configuring Precision Time Protocol” on page 331.

The Table 9 on page 144 summarizes the first Junos OS release that supports PTP on various Juniper devices:

Table 9: Precision Time Protocol Support

Juniper Devices	Junos OS Release
MX80 3D Universal Edge Routers with model number MX80-P	12.2
MX-MPC2E-3D-P (MPC2E P) on MX240, MX480, and MX960 routers	12.2
MX-MPC2E-3D-P (MPC2E P) on MX2010 and MX2020 routers	12.3
Following enhanced MPCs support PTP (1588v2): • MPC5E-40G10G on MX240, MX480, MX960, MX2010, and MX2020 routers • MPC5EQ-40G10G on MX240, MX480, MX960, MX2010, and MX2020 routers • MPC5E-100G10G on MX240, MX480, MX960, MX2010, and MX2020 routers • MPC5EQ-100G10G on MX240, MX480, MX960, MX2010, and MX2020 routers • MX2K-MPC6E on MX2010, and MX2020 routers	13.3R3
Ethernet Modular Interface Cards (MICs) on MX240, MX480, and MX960 routers	12.2
Ethernet Modular Interface Cards (MICs) on MX2010 and MX2020 routers	12.3
On MX240, MX480, MX960, MX2010, and MX2020 routers, the following Enhanced MPCs (MPCEs) support PTP (1588v2) under express licensing only: • MPC1E (MX-MPC1E-3D) • MPC1E Q (MX-MPC1E-3D-Q) • MPC2E (MX-MPC2E-3D) • MPC2E Q (MX-MPC2E-3D-Q) • MPC2E EQ (MX-MPC2E-3D-EQ) For more information about obtaining a license, contact JTAC.	12.3
ACX Series Universal Access Routers	12.2

NOTE: Unified in-service software upgrade (unified ISSU) is currently not supported when clock synchronization is configured for PTP on the MICs and Enhanced MPCEs on MX240, MX480, MX960, MX2010, and MX2020 routers.

NOTE: To switch between the PTP and Synchronous Ethernet modes, you must first deactivate the configuration for the current mode and then commit the configuration. Wait for a short period of 30 seconds, configure the new mode and its related parameters, and then commit the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331

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

Understanding Clock Synchronization on MX Series Routers

MX Series routers support external clock synchronization and automatic clock selection for Synchronous Ethernet, T1 or E1 line timing sources, and external inputs.

Configuring external clock synchronization and automatic clock selection requires making clock selection, quality level, and priority considerations. The clock source selection algorithm is used to pick the two best upstream clock sources from among the various sources on the basis of system configuration and execution criteria such as quality level, priority, and hardware restrictions.

MX5-T, MX10-T, MX40-T, MX80, MX80-T, MX240, MX480, MX960, and MX2020 routers support external clock synchronization using Synchronous Ethernet. Synchronous Ethernet is a physical layer technology that functions regardless of the network load and supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet.

The Switch Control Board (SCB) supports distributed clocking mode. Starting from Junos OS Release 12.2, the Enhanced Switch Control Board—SCBE—supports centralized clocking mode and has one external clock interface.

Starting from Junos OS Release 13.3, the Enhanced Switch Control Board—SCBE2—supports centralized clocking mode and has two external clock interfaces external-0/0 and external-1/0. Note that the external-0/0 interface refers to the external interface on the SCB in slot 0 and the external 1/0 interface refers to the external interface on the SCB slot 1.

NOTE: **On SCBE2, you can configure the external synchronization options only on the external interface on the active SCB. Therefore, if the active SCB is in slot 0, then you can configure the external-0/0 interface only. If the active SCB is in slot 1, then you can configure the external-1/0 interface only.**

The following sections explain external clock synchronization and its configuration parameters in detail:

Clock Selection

Configuring external clock synchronization requires making clock selection, quality level, and priority considerations. The clock selection algorithm is used to pick the two best clock sources—primary and secondary—from among the various sources.

The clock selection algorithm is on the basis of the system configuration and execution criteria such as quality level, priority, hardware restrictions, and so on, and is achieved using the following logic and restrictions:

- The following parameters must be configured irrespective of whether the quality level is enabled or not (You can set the quality level with the **set chassis synchronization source interfaces external quality-level** ***quality-level*** configuration command at the **[edit]** hierarchy level.):

  - Quality level must be configured for nonexternal clocks.
  - In the case of option-1, the quality level must be configured for the external clocks.
  - In the case of option-2, the default quality level for the external clocks is QL_STU.

  The synchronous Ethernet Equipment Clock (EEC) synchronization networking types option-1 and option-2 map to G.813 option 1 (EEC1) and G.812 type IV clock (EEC1) standards, respectively, and can be configured at the **[edit chassis synchronization]** hierarchy level.

- When the quality level is enabled, the received quality level must be equal to or better than the configured quality level for that particular source, otherwise that source is not considered for clock selection. This is so that a downstream client is guaranteed clock quality of a certain level. (Note that the term *certain level* here denotes the configured quality level.)

- Starting with Junos OS Release 12.2R1, configuring the quality level for a Synchronous Ethernet interface is optional when the **quality-mode** statement is enabled and the **selection-mode** statement is set to received-quality value.

  The default quality level value for a Synchronous Ethernet interface is:

  - **SEC** for the option-1 network type.
  - **ST3** for the option-2 network type.

- Configuring the **priority** statement is optional. When not specified, the external-a interface has a higher default priority than the external-b interface, and the external-b interface has a higher default priority than Ethernet-based sources such as ge or xe clock sources, which have the lowest default priority.

NOTE: Configured priority is higher than any default priority.

- During clock selection:
  - The active source with highest quality level is selected.
  - The configured (or default) quality level of the selected clock source is used for Ethernet Synchronization Message Channel (ESMC). In order to receive or transmit ESMC messages out of an interface, at least one logical interface must be configured on that interface.
  - Table 10 on page 147 explains a few scenarios that must be taken into consideration during clock selection:

Table 10: Clock Selection Scenarios

If	Then
Two or more sources have the same quality level.	The source with highest priority wins.
Two or more sources have the same quality level and priority.	The current active source, if any, among these sources wins.
Two or more sources have the same quality level and priority, and none of these is currently active.	Any one of these sources is picked.
Primary clock source is ge|xe-*x/y/z*, where *y* is even (0 or 2).	The secondary clock source cannot be ge|xe-*x/y*/* or ge|xe-*x/y* + 1/*. For example, if ge-1/2/3 is the primary clock source, then the secondary clock source cannot be ge-1/2/* or ge-1/3/* for an MX80, MX240, MX480, or an MX960 router.
Primary clock source is ge|xe-*x/y/z*, where *y* is odd (1 or 3).	The secondary clock source cannot be ge|xe-*x/y*/* or ge|xe-*x/y* - 1/*. For example, if xe-2/3/4 is the primary clock source, then the secondary clock source cannot be xe-2/2/* or xe-2/3/* for an MX80, MX240, MX480, or an MX960 router.
Primary clock source is ge|xe-*x/y/z*.	The secondary clock source cannot be ge|xe-*x/y*/* in the case of 12-port or 16-port 10-Gigabit Ethernet DPC on an MX Series router. For example, if ge-0/1/2 is the primary clock source, then ge-0/1/* cannot be the secondary clock source, but ge-0/0/* can be the secondary clock source.

Network Option

The clock type or network option is the synchronous Ethernet Equipment Clock (EEC) synchronization networking type. You can set the network option to one of the following values:

- **option-1**—This option maps to G.813 option 1 (EEC1).
- **option-2**—This option maps to G.812 type IV clock (EEC1).

NOTE: For SCB, this option is configured with the **set chassis synchronization network-type (option-1 | option-2)** configuration command at the **[edit]** hierarchy level.

To configure the clock type, execute the **set chassis synchronization network-option (option-1 | option-2)** configuration command at the **[edit]** hierarchy level.

NOTE: For Junos OS Releases 11.2R4 through 13.3R3 for MX240, MX480, MX960, MX2010, and MX2020 with SCB, SCBE or SCBE2, you must execute the following commands after you change the network option at the **[edit chassis synchronization]** hierarchy level. This is because the loop bandwidth does not change automatically when you change the network option.

```
user@host# deactivate chassis synchronization
user@host# activate chassis synchronization
```

Clock Mode

You can set the Synchronous Ethernet clock source to one of the following modes:

- **free-run**—In this mode, the free-running local oscillator is used as a clock source.

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

  For MX240, MX480, and MX960 routers with an SCB, the free-run clock is provided by the MPCs.

  For MX240, MX480, and MX960 routers with an SCBE or an SCBE2, the free-run clock is provided by the local oscillator.

- **auto-select**—In this mode, the best external clock source is selected.

By default, the auto-select option is selected.

To configure the clock mode, execute the **set chassis synchronization clock-mode (free-run | auto-select)** configuration command at the **[edit]** hierarchy level.

Quality Mode

The **quality-mode** statement, when enabled, ascertains that the clock selection algorithm uses both quality and priority of the clock sources to select the best clock source for clock synchronization. When the **quality-mode** statement is disabled, only the priority of the clock source is taken into account by the algorithm.

To enable the synchronization quality mode, execute the **set chassis synchronization quality-mode-enable** configuration command at the **[edit]** hierarchy level.

NOTE: **The Synchronous Ethernet ESMC quality mode is disabled by default.**

Selection Mode

You can specify whether the clock source selection must use the configured or the received ESMC or SSM quality level for a qualifying interface. In both selection modes, the interface qualifies for clock source selection only when the received ESMC or SSM quality level on the interface is equal to or greater than the configured ESMC or SSM quality level for the interface.

The selection modes are:

- **configured-quality**—In this mode, the clock source selection algorithm uses the ESMC or SSM quality level configured for a qualifying interface.
- **received-quality**—In this mode, the clock source selection algorithm uses the ESMC or SSM quality level received on the qualifying interface.

To configure the clock source algorithm selection mode, execute the **set chassis synchronization selection-mode (configured-quality|received-quality)** configuration command at the **[edit]** hierarchy level.

NOTE: **For the selection-mode statement to take effect, you must set the quality-mode-enable statement at the [edit chassis synchronization] hierarchy level.**

Hold Interval

You can set the chassis synchronization wait time after a change in configuration, the clock selection wait time after reboot of the router, and the switchover wait time after a switchover of SCB before selecting the new clock source. The hold interval options are:

- **configuration-change**—In this mode, the wait time for clock selection after a change in configuration (clock synchronization configuration) can be set from 15 seconds through 60 seconds.
- **restart**—In this mode, the wait time for clock selection after reboot of the router can be set from 60 seconds through 180 seconds.

- **switchover**—In this mode, the switchover wait time after clock recovery can be set from 30 seconds through 60 seconds.

To set the hold interval, execute the **set chassis synchronization hold-interval (configuration-change | restart | switchover)** ***seconds*** configuration command at the **[edit]** hierarchy level.

NOTE: **The default switchover wait time is 30 seconds and the default restart wait time is 120 seconds.**

Switchover Mode

You can set the switchover mode to switch the clock source from a lower quality to higher quality or to use the current clock source only. You can configure the switchover mode as one of the following:

- **non-revertive**—In this mode, the router uses the current clock source as long as it is valid.
- **revertive**—In this mode, the router automatically switches from a lower to a higher quality clock source whenever the higher clock source becomes available.

The default mode is revertive mode.

To configure the switching mode, execute the **set chassis synchronization switchover-mode (revertive | non-revertive)** configuration command at the **[edit]** hierarchy level.

Clock Source

You can specify the parameters that must be considered by the clock selection algorithm while selecting the best clock source. The parameters include the quality level value, the priority of the clock source, the request criteria, and the wait time to restore the interface signal to up state. You must specify these parameters on the external clock interfaces or other qualifying interfaces—which are connected to valid clock sources—to select the best clock source on the basis of the timing messages that are received on these interfaces.

For SCBE, you can configure only one external interface and configure multiple Ethernet interfaces as needed.

On SCBE2, you can configure two external interfaces—external-0/0 and external-1/0—and configure multiple Ethernet interfaces as needed.

To configure the clock source, execute the **set chassis synchronization source interfaces** ***interface-name*** configuration command. You can also configure the clock source with the **set chassis synchronization source interfaces external** at the **[edit]** hierarchy level, where the external option refers to an external clock interface.

NOTE: Incorporate the external option as needed on the basis of the SCB in your MX Series router.

To specify the clock source for an interface, you must set the following options:

- **priority**—You can set the user priority for the selected clock source from 1 through 5.

  To set the synchronization source priority for the selected clock source, execute the **set chassis synchronization source interfaces *interface-name* priority *number*** configuration command or the **set chassis synchronization source interfaces external priority *number*** configuration command at the **[edit]** hierarchy level.

- **request**—You can set the clock selection request criterion as one of the following:
  - **force-switch**—With this option, you can force the SCB to switch to a clock source you prefer on a particular interface (that is you can select a clock source on an interface overriding the algorithm), provided the source is enabled and not locked out. Only one configured source can be force-switched.
  - **lockout**—With this option configured, the clock source is not to be considered by the selection process. Lockout can be configured for any source.

  To configure these options, execute the **set chassis synchronization source interfaces *interface-name* request (force-switch|lockout)** configuration command or the **set chassis synchronization source interfaces external request (force-switch|lockout)** configuration command at the **[edit]** hierarchy level.

- **wait-to-restore**—You can set the wait-to-restore time for each interface. When an interface's signal transitions out of the signal fail state, it must be fault-free for the wait-to-restore time before it is again considered by the selection process. You can configure the interface signal upstate time—wait time before opening the interface to receive ESMC messages—from 0 through 12 minutes. The default time is 5 minutes.

  To configure the wait-to-restore time, execute the **set chassis synchronization source interfaces *interface-name* wait-to-restore *minutes*** configuration command or the **set chassis synchronization source interfaces external wait-to-restore *minutes*** configuration command at the **[edit]** hierarchy level.

- **quality**—You can set the ESMC clock's EEC quality level as prc, prs, sec, smc, ssu-a, ssu-b, st2, st3, st3e, st4, stu, or tnc. Both option I and option II SSM quality levels are supported. Table 11 on page 151 explains the quality level values.

Table 11: Quality Levels

Quality Level	Description
prc	Timing quality of a primary reference clock (option-1 only).
prs	Clock traceable to a primary reference source (option-2 only).
sec	Timing quality of an SDH equipment clock (option-1 only).
smc	Clock traceable to a self-timed SONET clock (option-2 only).

Table 11: Quality Levels *(continued)*

Quality Level	Description
ssu-a	Timing quality of a type I or IV slave clock (option-1 only).
ssu-b	Timing quality of a type VI slave clock (option-1 only).
st2	Clock traceable to Stratum 2 (option-2 only).
st3	Clock traceable to Stratum 3 (option-2 only).
st3e	Clock traceable to Stratum 3E (option-2 only).
st4	Clock traceable to Stratum 4 free-run (option-2 only).
stu	Clock traceable to an unknown quality (option-2 only).
tnc	Clock traceable to a transit node clock (option-2 only).

NOTE: When the quality level is not configured and no ESMC messages are received by the clock source, then the quality level is set to DNU for option-1 and DUS for option-2. You can configure the network options, option-1 and option-2 at the **[edit chassis synchronization network-option]** hierarchy level.

To avoid source looping on the selected active source—primary or secondary source, whichever is active—even when ESMC transmit is not enabled, a DNU ESMC message is sent out when the **network-option** statement is configured as option-1, and a DUS ESMC message is sent out when the **network-option** statement is configured as option-2. This is applicable only for clock sources configured on the Ethernet interfaces.

To configure the quality level, execute the **set chassis synchronization source interfaces** ***interface-name*****) quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc)** configuration command or the **set chassis synchronization source interfaces external quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc)** configuration command at the **[edit]** hierarchy level.

ESMC Packet Transmit

You can enable all the interfaces or configure one or more qualifying interfaces on which to permit ESMC transmit messages by executing the **set chassis synchronization esmc-transmit interfaces (all |*****interface-name*****)** configuration command at the **[edit]** hierarchy level.

Maximum Transmit Quality Level

To configure the maximum transmit quality level for SCBE2 as prc, prs, sec, smc, ssu-a, ssu-b, st2, st3, st3e, st4, stu, or tnc, execute the **set chassis synchronization max-transmit-quality-level *quality-level*** configuration command at the **[edit]** hierarchy level.

NOTE: Starting from Junos OS Release 13.3, you can configure the **max-transmit-quality-level** statement on SCB and SCBE as well.

Interfaces with Upstream Clock Source

You can configure the external interface to operate with a connected router for a clock source. This external interface can be configured for a clock source, which then becomes a candidate for selection as the chassis clock source by the clock source selection algorithm. You can configure several options for the external clock source interface on the SCBE and for the two external clock source interfaces on the SCBE2.

The options include E1 interface options, pulse-per-second option, the signal type for the provided reference clocks, and the T1 interface options at the **[edit chassis synchronization interfaces external]** hierarchy level.

The following sections explain the clock source interface parameters in detail:

E1 Interface Options

You can set the E1 interface-specific options as:

- **framing**—Set the framing mode for the E1 interface as one of the following:
  - **g704**—G.704 framing format for E1 interfaces
  - **g704-no-crc4**—G.704 framing without CRC4 for E1 interfaces.

  To set the framing mode for the E1 interface, execute the **set chassis synchronization interfaces external e1-options framing (g704|g704-no-crc4)** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) e1-options framing (g704|g704-no-crc4)** configuration command at the **[edit]** hierarchy level for SCBE2.

  By default, the g704 framing format is selected.
- **line-encoding**—Set the **line-encoding** statement as automatic mark inversion or high-density bipolar 3 code. The line encoding technique converts signals to bipolar pulses. You can set the **line-encoding** option as one of the following:

  - **ami**—Automatic mark inversion
  - **hdb3**—High-density bipolar 3 code

  To configure the **line-encoding** statement on the E1 interface, execute the **set chassis synchronization interfaces external e1-options line-encoding (ami|hdb3)** configuration command for SCBE at the **[edit]** hierarchy level or the **set chassis synchronization interfaces (external-0/0 | external-1/0) e1-options line-encoding (ami|hdb3)** configuration command at the **[edit]** hierarchy level for SCBE2.

  By default, the hdb3 line encoding technique is selected.

- **sabit**—Set the SA bit to a value from 4 through 8. SA bits are used for exchanging the SSM quality between the clock source and the router on the E1 interface.

  To set the SA bit on the E1 interface, execute the **set chassis synchronization interfaces external e1-options sabit *sabit-value*** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) e1-options sabit *sabit-value*** configuration command at the **[edit]** hierarchy level for SCBE2.

Pulse Per Second

You can enable the **pulse-per-second-enable** option on the GPS interface to receive the pulse per second (PPS) signal by executing the **set chassis synchronization interfaces external pulse-per-second-enable** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) pulse-per-second-enable** configuration command at the **[edit]** hierarchy level for SCBE2.

Signal Type

You can set the frequency for the provided reference clock (GPS or BITS) as one of the following:

- **1mhz**—Set the signal with a clock frequency of 1 MHz.
- **5mhz**—Set the signal with a clock frequency of 5 MHz.
- **10mhz**—Set the signal with a clock frequency of 10 MHz.
- **2048khz**—Set the signal with a clock frequency of 2048 kHz.
- **e1**—Set the signal as an E1-coded 2048 kHz signal on a 120-ohm balanced line.
- **t1**—Set the signal as a T1-coded 1.544 MHz signal on a 100-ohm balanced line.

Configure the signal type by executing the **set chassis synchronization interfaces external signal-type (1mhz | 5mhz | 10mhz | 2048khz | e1 | t1)** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) signal-type (1hz | 5mhz | 10mhz | 2048khz | e1 | t1)** configuration command at the **[edit]** hierarchy level for SCBE2.

The 1mhz, 5mhz, and the 10mhz signals are traceable to a GPS-capable clock source, where the source can be an atomic clock. The e1 and t1 signals are traceable to a BITS clock source.

T1 Interface Options

You can set the T1 interface-specific options as:

- **framing**—Set the framing mode for the T1 interface as one of the following:
  - **esf**—Extended superframe
  - **sf**—Superframe

  To set the framing mode for the T1 interface, execute the **set chassis synchronization interfaces external t1-options framing (esf|sf)** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) t1-options framing (esf|sf)** configuration command at the **[edit]** hierarchy level for SCBE2.

  By default, the esf framing mode is selected.

- **line-encoding**—Set the **line-encoding** option on the T1 interface as one of the following:
  a. **ami**—Automatic mark inversion
  b. **b8zs**—8-bit zero suppression

  To configure the **line-encoding** option on the T1 interface, execute the **set chassis synchronization interfaces external t1-options line-encoding (ami|b8zs)** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) t1-options line-encoding (ami|b8zs)** configuration command at the **[edit]** hierarchy level for SCBE2.

  By default, the b8z3 line encoding technique is selected.

External Output Interface

You can set several options for the external clock output interface for SCBE or for the two external clock output interfaces for SCBE2.

The options include disabling the holdover mode; configuring a minimum quality threshold; configuring a mode to select a clock source; configuring the transmit quality level to DNU or DUS; and disabling wander filtering at the **[edit chassis synchronization output interfaces external]** hierarchy level for SCBE or at the **[edit chassis synchronization output interfaces (external0-0 | external-1/0)]** hierarchy level for SCBE2.

The following sections explain the external output interface parameters in detail:

Holdover Mode

You can disable the holdover mode on the external output interface by executing the **set chassis synchronization output interfaces external holdover-mode-disable** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization output interfaces (external-0/0 | external-1/0) holdover-mode-disable** configuration command at the **[edit]** hierarchy level for SCBE2.

Minimum Quality

When the quality of the source signal—used to derive the output—falls below a minimum quality level, the output of the external interface is placed in holdover mode. When the signal type supports the SSM quality level, the SSM quality level is set as the holdover quality level. The output interface remains in holdover mode until a source with the minimum quality level or higher is available. Note that when the **holdover-mode-disable** option is configured, the output is suppressed completely.

You can set the minimum quality on the external output interface as prc, prs, sec, smc, ssu-a, ssu-b, st2, st3, st3e, st4, stu, or tnc by executing the **set chassis synchronization output interfaces external minimum-quality *quality-level*** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization output interfaces (external-0/0 | external-1/0) minimum-quality *quality-level*** configuration command at the **[edit]** hierarchy level for SCBE2.

Source Mode

When the source mode is set to chassis, the source selected by the chassis clock module is used as the clock source. When the source mode is set to line, the best available line clock is selected.

You can set the source mode for selecting a clock source as either a chassis clock or the best line clock source as output by executing the **set chassis synchronization output interfaces external source-mode (chassis|line)** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization output interfaces (external-0/0 | external-1/0) source-mode (chassis|line)** configuration command at the **[edit]** hierarchy level for SCBE2.

Transmit Quality Level

You can configure the **tx-dnu-to-line-source-enable** statement to enable the transmit quality level to DNU or DUS when the chassis clock is the BITS input signal and when a valid line source signal is sent out through the BITS output.

You can set the transmitting quality level to DNU or DUS on the line source interface by executing the **set chassis synchronization output interfaces external tx-dnu-to-line-source-enable** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization output interfaces (external-0/0 | external-1/0) tx-dnu-to-line-source-enable** configuration command at the **[edit]** hierarchy level at SCBE2.

Wander Filter

You can disable the wander filter by executing the **set chassis synchronization output interfaces external wander-filter-disable** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization output interfaces (external-0/0 | external-1/0) wander-filter-disable** configuration command at the **[edit]** hierarchy level for SCBE2.

Clock Synchronization Ports

Starting with Junos OS Release 13.3, you can set the **time-of-day-format** statement as an ASCII string on SCBE and SCBE2 by executing the **set chassis synchronization port auxiliary client time-of-day-format ascii string** configuration command at the **[edit]** hierarchy level.

The time of day (TOD) format is specified as a string of ASCII characters. The TOD format string contains information that specifies which ASCII characters to match, which ASCII characters to ignore, and which ASCII characters to translate to particular time units (such as month, day, hour, minute, and so on).

The TOD format string specifies how the incoming string is to be parsed so that the information embedded can be extracted. The format of the TOD option can be executed with the **set chassis synchronization port auxiliary time-of-day-format ascii *string*** configuration command at the **[edit]** hierarchy level, where the format of the data string is **$GPRMC,%hh%mm%ss,^,^^^^.^^,^,^^^^^^^^^,^,^^^^^,^^^^^,%DD%MM%YY,^^^^^,^*^^**.

Table 12 on page 157 explains pattern-matching characters used in the TOD data string.

Table 12: Pattern-Matching Characters

Character construct	Number of characters	Description
-	1	The *DO NOT CARE* (DNC) character
%hh	2	Hours (00–23)
%mm	2	Minutes (00–59)
%ss	2	Seconds (00–59)
%DD	2	Day (01–31)
%MM	2	Month (01–12)
%YY	2	Year without century
%YYY	4	Year with century
%DDD	3	Day of year (001–366)

Table 12: Pattern-Matching Characters *(continued)*

Character construct	Number of characters	Description
%MMM	3	Month of year (JAN, FEB, etc.)
%cc	2	NMEA message checksum
%Q	1	Time quality indicator (' ' = valid '*' = error)

There are several patterns that can be received by a router. The following pattern shows an example of a received TOD data string (as defined in the National Marine Electronics Association (NMEA) 0183 standard. The data string is called the Recommended Minimum Specific GPS/Transit Data (RMC) message.) and Table 13 on page 158 explains it in detail.

```
$GPRMC,225446,A,4916.45,N,12311.12,W,000.5,054.7,191194,020.3,E*68<CR><LF>
```

Table 13: Received TOD Data String

Pattern	Description
$GPRMC	NMEA sentence ID
225446	UTC time of fix (22:54:46 UTC)
A	Data status (A=Valid position, V=navigation receiver warning)
4916.45	Latitude of fix
N	N or S of longitude
12311.12	Longitude of fix
W	E or W of longitude
000.5	Speed over ground in knots
054.7	Track made good in degrees True
191194	UTC date of fix (19 November 1994)
020.3	Magnetic variation degrees
E	E or W of magnetic variation
*68	Checksum (XOR of all characters between $ and *)

NOTE: Whenever a TOD data string does not provide sufficient information, the router extracts it from Junos OS and generates a log message. The TOD data string that is either transmitted or received is always of fixed length and is delimited by a <CR><LF>character pair, where CR (carriage return) and LF (line feed) are the line break types used to end the ASCII format string.

MIC-Level Framing Mode

You can configure the LAN framing mode on the 10-Gigabit Ethernet MIC with XFP by executing the **set chassis fpc *fpc-slot* pic *pic-slot* framing lan** at the **[edit]** hierarchy level.

Note that to operate in LAN framing mode on the 10-Gigabit Ethernet MIC with XFP, you must configure the interface framing mode on the MIC interface. Execute the **set interfaces xe-*fpc/pic/port* framing-mode (lan-phy | wan-phy)** configuration command at the **[edit]** hierarchy level, where the lan-phy option denotes a 802.3ae 10-Gbps LAN-mode interface and the wan-phy option denotes a 802.3ae 10-Gbps WAN-mode interface.

Related Documentation

- Centralized Clocking Overview on page 126
- Configuring Clock Synchronization Interface on MX Series Routers on page 309
- Ethernet Synchronization Message Channel Overview on page 130
- Example: Configuring Synchronous Ethernet on MX Series Routers on page 320
- **request chassis synchronization mode on page 670**
- **show chassis synchronization (MX Series Routers) on page 1550**
- **synchronization on page 581**

Understanding ESMC Quality Level Mapping

Ethernet Synchronization Message Channel (ESMC) is a logical communication channel. It transmits Synchronization Status Message (SSM) information, which is the quality level of the transmitting synchronous Ethernet equipment clock (EEC), by using ESMC protocol data units (PDUs). ESMC support is based on the ITU G.8264 specification. In order for an interface to receive or transmit ESMC messages, at least one logical interface must be configured on that interface. If the interface is currently not configured with a logical interface, you must configure a logical interface by using the **[set interfaces interface-name unit 0]** statement at the **[edit]** hierarchy level.

The following factors affect the ESMC quality level value that is transmitted out on the interfaces configured at the **[edit chassis synchronization esmc-transmit interfaces]** hierarchy level:

- Quality mode
- Selection mode
- Conversion of PTP clock class flag

Other than the aforementioned factors, the software phase lock loop (spll) state or the hybrid state impacts the transmitted ESMC quality level when the router is in PTP mode or hybrid mode, respectively.

The following sections explain how the ESMC quality level is handled in various situations:

Synchronous Ethernet Mode

In Synchronous Ethernet mode, the ESMC quality level is handled in the following way:

- In quality mode:
  - If the **quality-mode-enable** option at the **[show chassis synchronization]** hierarchy level is not set, then the configured quality and the priority set for the clock sources are used for the clock selection. The ESMC quality level is based on the configured quality level corresponding to the active clock source.
  - If the **quality-mode-enable** option at the **[show chassis synchronization]** hierarchy level is set, then only those clock sources that receive ESMC quality level is higher than or equal to the configured quality are considered for selection. The ESMC quality level value transmitted also depends on the selection mode option as discussed next.

- In selection mode:
  - If the **selection-mode** option at the **[show chassis synchronization]** hierarchy level is set to **configured-quality**, then the configured quality for the selected, active source is used as the system ESMC quality level value that is transmitted out.
  - If the **selection-mode** option at the **[show chassis synchronization]** hierarchy level is set to **received-quality**, then the received ESMC quality level value from the selected clock source is transmitted out.
- When no clock sources are locked:
  a. Do Not Use (DNU)/Don't Use for Synchronization (DUS) quality level is transmitted.
  b. The ESMC quality level value sent out on the selected, active clock source interface is always DNU/DUS.

Precision Time Protocol Mode

In Precision Time Protocol (PTP) mode, you can transmit ESMC quality level values with the following parameters set:

- The **network-option** option must be configured at the **[edit chassis synchronization]** hierarchy level.
- Synchronous Ethernet sources must not be configured at the **[edit chassis synchronization]** hierarchy level.
- The **convert-clock-class-to-quality-level** option at the **[edit protocols ptp slave]** hierarchy level must be enabled so that the PTP clock class received from the selected master is converted to the appropriate ESMC quality level.

Clock class is a value that ranges from 80 through 109 and is used to map the clock class to the set ESMC quality level. The ESMC quality level value is mapped to the clock class value by one of the following methods:

- Mapping of PTP clock class to ESMC quality level—By default, the standard mappings suggested by ITU-T G.781 specification are used as shown in Table 14 on page 161 and irrespective of the clock being configured in hybrid mode or pure PTP mode, the outgoing quality level is always based on the PTP clock class mapping. To map the PTP clock class to the ESMC quality level, you must set the **convert-clock-class-to-quality-level** option at the **[edit protocols ptp slave]** hierarchy level. For default mapping values, see Table 14 on page 161.

Table 14: Default Quality Level to PTP Clock-Class Mapping

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

Table 14: Default Quality Level to PTP Clock-Class Mapping *(continued)*

SSM QL (Binary)	Standard Mappings Given in ITU-T G.781 Specification		PTP Clock Class
0010	QL-PRC	-	84
0111	-	QL-ST2	86
0011	-	-	88
0100	QL-SSU-A	QL-TNC	90
0101	-	-	92
0110	-	-	94
1000	QL-SSU-B	-	96
1001	-	-	98
1101	-	QL-ST3E	100
1010	-	QL-ST3/ QL-EEC2	102
1011	QL-SEC/ QL-EEC1		104
1100	-	QL-SMC	106
1110	-	QL-PROV	108
1111	QL-DNU	QL-DUS	110

- User-defined mapping of PTP clock class to ESMC quality level—You can manually override the clock class to ESMC mapping by setting the **clock-class** option at the **[edit protocols ptp slave clock-class-to-quality-level-mapping quality level *ql-value*]** hierarchy level.

Unlike Synchronous Ethernet, the DNU/DUS quality level value is not transmitted on the interface on which the PTP master is configured. In PTP mode, an interface is configured as part of the **[edit chassis esmc-transmit interfaces]** hierarchy level, and an appropriate ESMC quality level value is transmitted through it. Note that when the PTP clock class value received from the master changes, the ESMC quality level transmitted also changes appropriately. If there is no valid clock class value as input, then the DNU/DUS value is transmitted on the interfaces configured under the **esmc-transmit** option at the **[edit chassis synchronization]** hierarchy level.

To view the current mapping between the clock class and the ESMC quality level, run the **show ptp quality-level-mapping** operational mode command.

To display the ESMC quality level currently transmitted by the interface, run the **show ptp global-information** operational mode command in PTP or hybrid mode. Note that when the **convert-clock-class-to-quality-level** option is disabled or when there is no valid clock class as input, the **show ptp global information** command does not display the ESMC quality level value.

To view the ESMC quality level transmitted in all modes, run the **show synchronous-ethernet esmc transmit detail** operational mode command.

Hybrid Mode

Hybrid mode is a combination of PTP and Synchronous Ethernet modes.

The configuration required for transmitting the ESMC quality level in hybrid mode differs from that in PTP mode in the following ways:

- In hybrid mode, synchronous Ethernet source interfaces must be configured at the **[edit chassis synchronization]** hierarchy level.
- In hybrid mode, configuring the **convert-clock-class-to-quality-level** option is optional. When this option is configured, the outgoing ESMC quality level behavior is the same as that in PTP mode. When the **convert-clock-class-to-quality-level** option is not configured, the outgoing ESMC quality level behavior is the same as that in Synchronous Ethernet mode.

Feature Mode Changes

When the router configuration is changed from one feature mode to another mode—that is from or to Synchronous Ethernet, PTP, or hybrid mode—the following occurs:

1. The ESMC quality level is reset to DNU.
2. Based on the new feature mode, the ESMC quality level is decided:
    - When the reference clock qualifies for Synchronous Ethernet mode.
    - When PTP goes into phase-aligned state or hold-over state in PTP mode.
    - When the hybrid state reaches *frequency and phase aligned* state in hybrid mode.

Sometimes PTP is required to drive Synchronous Ethernet and ESMC. This scenario occurs when:

- After certain PTP hops, the network branches out, and one branch of the network requires only frequency synchronization while the other branch requires both phase and frequency synchronization.
- A packet-based distribution network is located between a time-division multiplexing (TDM), a SONET, and a Synchronous Ethernet network.

In such situations, the clock recovered by PTP is sent over the Ethernet physical transceiver for Synchronous Ethernet, and the ESMC quality level value mapping with the PTP clock class is sent over the interfaces.

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 338
- Understanding Hybrid Mode on page 164
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133

Understanding Hybrid Mode

The combined operation of Synchronous Ethernet and Precision Time Protocol (PTP) is also known as hybrid mode. The following sections explain hybrid mode in detail:

- Hybrid Mode Overview on page 164
- Supporting Platforms on page 165

Hybrid Mode Overview

In hybrid mode, the synchronous Ethernet equipment clock (EEC) on the Modular Port Concentrator (MPC) derives the frequency from Synchronous Ethernet and the phase and time of day from PTP. Time synchronization includes both phase synchronization and frequency synchronization.

Synchronous Ethernet is a physical layer–based technology that functions regardless of the network load. Synchronous Ethernet supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet. PTP (also known as IEEE 1588v2) synchronizes clocks between nodes in a network, thereby enabling the distribution of an accurate clock over a packet-switched network. This synchronization is achieved through packets that are transmitted and received in a session between a master clock (commonly called the master) and a slave clock (also known as the slave in PTP terminology).

NOTE: **Router clocks are categorized based on the role of the router in the network. They are broadly categorized into ordinary clocks and boundary clocks. The master clock and the slave clock are known as ordinary clocks. The boundary clock can operate as either a master or a slave.**

Synchronous Ethernet works on the principle of frequency synchronization, whereby the frequencies of all the clocks (intermediate master and slave clocks) in the network are synchronized to the frequency of the master clock at the starting end of the network trail. PTP works on the principle of phase synchronization and frequency synchronization—it synchronizes both frequency and phase, including time of day. Phase synchronization is achieved either by adjusting the phase of the slave clock (the router’s internal clock oscillator) discontinuously by receiving clock signals from the master clock at irregular periods of time or by adjusting the phase-locked loop of the slave internal clock at regular intervals. The accuracy of clock synchronization depends on factors such as packet delay variation, quality of oscillator used, network asymmetry, and so on.

Synchronous Ethernet and PTP provide frequency and phase synchronization; however, accuracy in the order of nanoseconds is difficult to achieve through PTP or Synchronous Ethernet and these technologies do not support a large number of network hops. Hybrid mode resolves these issues by extending the number of network hops and also provides clock synchronization accuracy in the order of tens of nanoseconds. Hybrid mode is configured on the slave. On the slave, you can configure one or more interfaces as Synchronous Ethernet source interfaces.

Hybrid mode has an internal threshold value of 100 nanoseconds for the PTP phase difference before the PTP phase adjustment can initiate. To understand PTP phase difference and adjustment, consider a scenario involving two PTP sources—PTP1 and PTP2—and one Synchronous Ethernet source. Assume that initially the PTP1 source and the Synchronous Ethernet source are up and the PTP2 source is down. Also, assume that the router clock (slave) is synchronized to the available PTP source—PTP1—and the Synchronous Ethernet source. Suppose that after sometime the PTP1 source goes down because of technical issues—during which time the PTP2 source has come up—which, in turn, triggers the best master clock algorithm to run automatically, latching the router clock to the next available PTP source—that is, the PTP2 source—and the Synchronous Ethernet source. Note that a PTP phase adjustment is triggered when the phase difference between the current actual time of day (TOD) and the TOD as calculated by the algorithm as a result of the communication with the PTP2 source is at least 100 nanoseconds. Although this phase difference can occur anytime during the operation of the router in hybrid mode, this phase difference is more likely to occur only during PTP source switchover. You must always add a measurement error of 10 through 20 nanoseconds to the original internal threshold value. This error adjustment results in a phase difference threshold value of 110–120 nanoseconds.

For information about configuring hybrid mode, see "Configuring Hybrid Mode and ESMC Quality Level Mapping" on page 335. You can use the **show ptp hybrid status** operational command to find the current operating mode.

Supporting Platforms

Hybrid mode is supported on the Juniper Networks MX240, MX480, and MX960 3D Universal Edge Routers and on the Juniper Networks MX80 3D Universal Edge Routers with precision timing support (MX80-P) and with timing support (MX80-T).

On the MX240, MX480, and MX960 routers, the combined operation is possible only when the PTP client and the Synchronous Ethernet source are on the same enhanced MPC and are traceable to the same primary reference clock (PRC).

When acting as PTP slaves, MX80-P routers can accept any external Synchronous Ethernet clock as reference and do not support building-integrated timing supply (BITS) input as frequency source in hybrid mode of operation. Only Synchronous Ethernet sources are allowed in hybrid mode. Note that when the selected Synchronous Ethernet reference fails, the router continues to work in PTP mode.

Unified in-service software upgrade (unified ISSU) is not supported when clock synchronization is configured for hybrid mode on MX80-P and MX80-T routers, and on the MICs and enhanced MPCs on MX240, MX480, and MX960 routers.

NOTE: To switch between PTP and Synchronous Ethernet modes, you must first deactivate the configuration for the current mode and then commit the configuration. Wait for 30 seconds, configure the new mode and its related parameters, and then commit the configuration.

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 338
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133

CHAPTER 3

Router Chassis Network Services Configuration Overview

Network Services Mode Overview

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

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

  You can use either Enhanced IP Network Services mode or Enhanced Ethernet Network Services mode to improve the scaling and performance specific to filters in a subscriber access network that uses statically configured subscriber interfaces. For more information about using enhanced network services modes with firewall filters, see *Firewall Filters and Enhanced Network Services Mode Overview*.

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

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

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

- You must configure a router chassis that has only MPC-3D-16XGE-SFPP modules installed for Ethernet Network Services mode or Enhanced Ethernet Network Services mode. If the router chassis has both MPC-3D-16XGE-SFPP and

MPC-3D-16XGE-SFPP-R-B modules installed, only Ethernet Network Services mode or Enhanced Ethernet Network Services mode can be configured on the chassis.

- You can configure a router chassis with only MPC-3D-16XGE-SFPP-R-B modules installed for any network services mode. However, this configuration requires installing the appropriate license if you want to use IP Network Services mode or Enhanced IP Network Services mode. The licenses for these services are paper licenses.
- You can configure a router chassis with only MPC4E-3D-2CGE8XGE-IR-B, MPC4E-3D-32XGE-IR-B, MPC4E-3D-2CGE8XGE-R-B, or MPC4E-3D-32XGE-R-B modules installed for any network services mode.

  NOTE: The -IR-B type is applicable only for MPC4E modules.

NOTE: If Dense Port Concentrators (DPCs) in Ethernet Network Services mode or Enhanced Ethernet Network Services mode are up and running, you cannot configure the system for IP Network Services mode. You must first disable any Ethernet Network Services mode DPCs before switching to IP Network Services mode.

NOTE: Starting from Junos OS Release 13.3, you can configure the network services mode—Enhanced IP Network Services mode and Enhanced Ethernet Network Services mode—on MX240, MX480 and MX960 routers with an SCBE2 with the enhanced-ip option or the enhanced-ethernet option at the [edit chassis network-services] hierarchy level.

Table 15 on page 168 explains the different module functions when you configure the MX Series 3D Universal Edge router chassis for different network services modes.

Table 15: 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. Starting with Junos OS Release 14.1, a router with Enhanced Ethernet Services DPCs (DPCE-X) and Enhanced Queuing Ethernet Services DPCs (DPCE-X-Q) modules is powered on by default. The default network services mode is IP Network Services mode if you do not configure a services mode on DPCE-X or DPCE-X-Q modules. Until Junos OS Release 13.3, all modules except DPCE-X and DPCE-X-Q modules are powered on, and DPCE-X or DPCE-X-Q modules are powered off by default.

Table 15: Network Services Mode Functions *(continued)*

Configuration Upon Boot or Configuration Change	Module Function
Ethernet Network Services mode (upon boot)	All modules are powered on. However, operating in Ethernet Network Services mode restricts certain BGP protocol functions and does not support Layer 3 VPN, unicast RPF, and source and destination class usage (SCU and DCU) functions. In addition, the number of externally configured filter terms is restricted to 64K. Ethernet Network Services mode provides support for only Layer 2.5 functions.
Enhanced IP Network Services mode (upon boot)	Only MPCs and MS-DPCs are powered on. NOTE: Only Multiservices DPCs (MS-DPCs) are powered on with the enhanced network services mode options. No other DPCs function with the enhanced network services mode options.
Enhanced Ethernet Network Services mode (upon boot)	Only MPCs and MS-DPCs are powered on. All restrictions for operating in Ethernet Network Services mode apply. NOTE: Only Multiservices DPCs (MS-DPCs) are powered on with the enhanced network services mode options. No other DPCs function with the enhanced network services mode options.
Change from IP Network Services mode to Ethernet Network Services mode	DPCE-X and DPCE-X-Q modules are powered on; no reboot is required. No impact to 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 MPCs or MS-DPCs.
Change from Enhanced IP Network Services mode to Enhanced Ethernet Network Services mode	No reboot is required; no impact to MPCs or MS-DPCs.
Change from IP Network Services mode to Enhanced IP Network Services mode	Reboot required.
Change from Ethernet Network Services mode to Enhanced Ethernet Network Services mode	Reboot required.

The details of Layer 2.5 support for Ethernet Network Services mode are shown in Table 16 on page 171.

Network Services on SCBE2

The following scenarios are to be noted when you are using an MX Series router with an SCBE2:

- You must configure the **set chassis network-services (enhanced-ip | enhanced-ethernet)** configuration command and reboot the router to bring up the FPCs on the router.

However, after the router reboot the MS DPC, the MX FPC, and the ADPC are powered off.

- All the FPCs and DPCs in the router are powered off when you reboot the router without configuring either the enhanced-ip option or the enhanced-ethernet option at the **[edit chassis network-services]** hierarchy level.
- You must reboot the router when you configure or delete the enhanced-ip option or the enhanced-ethernet option at the **[edit chassis network-services]** hierarchy level. The following warning message is displayed when the enhanced-ip or the enhanced-ethernet configuration commands are configured or deleted at the **[edit chassis network-services]** hierarchy level, which prompts you to reboot the router.

```
'chassis'
WARNING: Chassis configuration for network services has been changed. A
system reboot is mandatory. Please reboot the system NOW. Continuing without
a reboot might result in unexpected system behavior.
commit complete
```

NOTE: Dynamic multicast replication mode is supported on SCBE2. Static multicast replication mode is not supported on SCBE2.

NOTE: If a route's next-hop is an unicast next-hop via IRB and the corresponding MAC address is learned over a LSI, the IRB will derive the L2 info from the indirect next-hop for the LSI. If you configure the **load- balance per -packet** policy statement, the indirect next-hop of the LSI will point to an unilist. The unilist will have all the member links to load balance the packets towards the MPLS cloud. The **enhanced-ip** option needs to be configured to enable the unicast next-hop for IRB to use the unilist as the L2-forwards next-hop and load balance the packets.

Related Documentation

- *Firewall Filters and Enhanced Network Services Mode Overview*
- Table 16 on page 171
- **enhanced-mode on page 485**
- **show chassis fpc on page 1212**

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

Table 16 on page 171 lists Junos OS feature restrictions when running in Ethernet Network Services mode or Enhanced Ethernet Network Services mode.

Table 16: Restricted Software Features in Ethernet Network Services Mode

Software Feature	Restriction in Ethernet Network Services Mode
BGP	• Data plane support applies only to Ethernet and MPLS. • BGP only supports the following address families: inet labeled-unicast, inet unicast, inet-vpn unicast, l2vpn, and route-target
L3VPN	Layer 3 VPNs are supported. You can only include loopback interfaces in the Virtual Routing and Forwarding (VRF) instance. A maximum of two VRFs are supported. Each VRF can handle up to 10,000 routes. The **ping mpls l3vpn** operational mode command is also supported.
Unicast RPF	Unicast reverse-path forwarding is disabled.
Source and destination class usage (SCU and DCU)	Source and Destination Class Usage is disabled.
Filter terms	The number of externally configured filter terms is restricted to 64 KB.
Prefixes	The number of supported prefixes is restricted to 32 K.

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

Related Documentation

- Network Services Mode Overview on page 167
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 254

CHAPTER 4

TX Matrix and TX Matrix Plus Router Configuration Overview

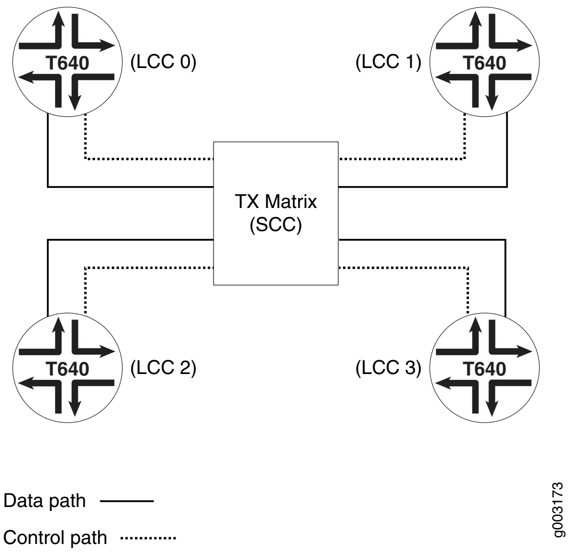
TX Matrix Router and T640 Router Configuration Overview

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 174.

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 175.

Running Different Junos OS Releases on the TX Matrix Router and T640 Routers

On a routing matrix, if you elect to run different Junos OS Releases on the TX Matrix router and T640 Routing Engines, a change in Routing Engine mastership can cause one or all T640 routers to be logically disconnected from the TX Matrix router.

NOTE: The routing matrix supports Release 7.0 and later versions of the Junos OS. All the master Routing Engines on the routing matrix must use the same software version. For information about hardware and software requirements, see the *TX Matrix Router Hardware Guide*.

TX Matrix Router Software Upgrades and Reinstallation

By default, when you upgrade or reinstall software on the TX Matrix router, the new software image is distributed to the connected T640 routers. Software installed on a primary TX Matrix router is distributed to all connected primary T640 routers and the backup is distributed to all connected backup routers.

TX Matrix Router Rebooting Process

When you reboot the TX Matrix router master Routing Engine, all the master Routing Engines in the connected T640 routers reboot. In addition, you can selectively reboot the master Routing Engine or any of the connected T640 routers.

Committing Configurations on the TX Matrix Router

In a routing matrix composed of a TX Matrix router and T640 routers, all configuration must be performed on the TX Matrix router. Any configuration you commit on a T640 router is not propagated to the TX Matrix router or other T640 routers. Only configuration changes you commit on the TX Matrix router are propagated to all T640 routers. A commit on a TX Matrix router overrides any changes you commit on a T640 router.

If you issue the **commit** command, you commit the configuration to all the master Routing Engines in the routing matrix.

```
user@host# commit
scc-re0:
configuration check succeeds
lcc0-re0:
commit complete
lcc1-re0:
commit complete
scc-re0:
commit complete
```

NOTE: **If a commit operation fails on any node, then the commit operation is not completed for the entire TX Matrix router.**

If you issue the **commit synchronize** command on the TX Matrix router, you commit the configuration to all the master and backup Routing Engines in the routing matrix.

```
user@host# commit synchronize
scc-re0:
configuration check succeeds
lcc0-re1:
commit complete
lcc0-re0:
commit complete
lcc1-re1:
commit complete
lcc1-re0:
commit complete
scc-re1:
```



```
commit complete
scc-re0:
commit complete
```

TX Matrix and T640 Router Configuration Groups

For routers that include two Routing Engines, you can specify two special group names—**re0** and **re1**. These two special group names apply to the Routing Engines in slots 0 and 1 of the TX Matrix router. In addition, the routing matrix supports group names for the Routing Engines for each T640 router: **lcc *n*-re0** and **lcc *n*-re1**. ***n*** identifies a T640 router from 0 through 3.

Routing Matrix System Log Messages

You configure the T640 routers to forward their system log messages to the TX Matrix router at the **[edit system syslog host scc-master]** hierarchy level. For information about how to configure system log messages in a routing matrix, see *Junos OS System Log Overview* and *Configuring System Logging for a TX Matrix Router*.

Related Documentation

- Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 189

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 17 on page 177. You can use the converted FPC number to configure the interfaces on the TX Matrix router in your routing matrix.

Table 17: 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 189

TX Matrix Plus Router Configuration Overview

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

TX Matrix Plus Router and Router-Based Routing Matrix Overview

A routing matrix based on a Juniper Networks TX Matrix Plus Router is a multichassis architecture composed of one TX Matrix Plus router and one of the following line-card chassis (LCC) configurations:

- TXP-T1600 configuration—Supports up to four interconnected Juniper Networks T1600 Core Routers.
- TXP-T1600-3D configuration—Supports up to eight interconnected Juniper Networks T1600 Core Routers.
- TXP-4000-3D configuration—Supports up to four interconnected Juniper Networks T4000 Core Routers.
- TXP-Mixed-LCC-3D configuration—Supports the following combinations of T1600 and T4000 routers:
  - Six T1600 routers and one T4000 router
  - Four T1600 routers and two T4000 routers
  - Two T1600 routers and three T4000 routers

NOTE: The TXP-T1600-3D, TXP-T4000-3D, and TXP-Mixed-LCC-3D configurations use 3D SIBs (TXP-F13-3D and TXP-F2S-3D SIBs on the switch-fabric chassis or the SFC and TXP-LCC-3D SIB on the LCCs). For more details on the hardware components used in the routing matrix with TX Matrix Plus Router, see the *TX Matrix Plus Router Hardware Guide*.

From the perspective of the user interface, the routing matrix appears as a single router. The TX Matrix Plus router controls all the T1600 or T4000 routers in the routing matrix.

You configure and manage the TX Matrix Plus router and its T1600 or T4000 routers in the routing matrix through the CLI on the TX Matrix Plus router. This means that the configuration file on the TX Matrix Plus router is used for the entire routing matrix.

Because all configuration, troubleshooting, and monitoring are performed through the TX Matrix Plus router, we do not recommend accessing its T1600 or T4000 routers directly (through the console port or management Ethernet interface [**em0**]). If you do, the following messages appear when you first start the CLI through a T1600 or T4000 router:

```
warning: This chassis is a Line Card Chassis (LCC) in a multichassis system.
warning: Use of interactive commands should be limited to debugging.
warning: Normal CLI access is provided by the Switch Fabric Chassis (SFC).
warning: Please logout and log into the SFC to use CLI.
```

These messages appear because any configuration you commit on a T1600 or a T4000 router is not propagated to the TX Matrix Plus router or other T1600 or T4000 routers in the routing matrix. For details, see "Committing Configurations on the TX Matrix Plus Router" on page 181.

Running Different Junos OS Releases on the TX Matrix Plus Router and T1600 or T4000 Routers

On a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers, if you elect to run different Junos OS Releases on the TX Matrix Plus router and T1600 or T4000 Routing Engines, a change in Routing Engine mastership can cause one or all T1600 or T4000 routers to be logically disconnected from the TX Matrix Plus router.

NOTE: All the master Routing Engines on the routing matrix must use the same Junos OS version. For information about hardware and software requirements, see the *TX Matrix Plus Router Hardware Guide*.

TX Matrix Plus Router Software Upgrades and Reinstallation

By default, when you upgrade or reinstall software on the TX Matrix Plus router, the new software image is distributed to the connected routers.

TX Matrix Plus Router Rebooting Process

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

TX Matrix Plus Router Routing Engine Rebooting Sequence

The Routing Engines on the TX Matrix Plus router and T1600 or T4000 routers in the routing matrix boot from the storage media in this order: the USB device (if present), the Compact Flash card (if present), the disk (if present) in slot 1, and then the LAN.

TX Matrix Plus Router Management Ethernet Interfaces

The management Ethernet interface used for the TX Matrix Plus router and the T1600 or T4000 routers in a routing matrix is **em0**. This interface provides an out-of-band method for connecting to the routers in the routing matrix. The Junos OS automatically creates the router's management Ethernet interface, em0. To use **em0** as a management port, you must configure its logical port, **em0.0**, with a valid IP address.

NOTE:

- The Routing Engines in the TX Matrix Plus router and in the T1600 or T4000 routers configured in a routing matrix do not support the management Ethernet interface fxp0 or the internal Ethernet interfaces fxp1 or fxp2.
- Automated scripts that have been developed for standalone routers (T1600 routers not configured in a routing matrix) might contain references to the fxp0, fxp1, or fxp2 interfaces. Before reusing the scripts on T1600 routers in a routing matrix, edit any command lines that reference the T1600 router management Ethernet interface fxp0 by replacing "fxp0" with "em0".

TX Matrix Plus Router Internal Ethernet Interfaces

On a TX Matrix Plus router, the Routing Engine (RE-TXP-SFC) and Control Board (TXP-CB) function as a unit, or a host subsystem. For each host subsystem in the router, Junos OS automatically creates two internal Ethernet interfaces, **ixgbe0** and **ixgbe1**, for the two 10-Gigabit Ethernet ports on the Routing Engine.

Routing Matrix-Based T1600 or T4000 Router Internal Ethernet Interfaces

On a T1600 or a T4000 router configured in a routing matrix, the Routing Engine (RE-TXP-LCC) and Control Board (LCC-CB) function as a unit, or a host subsystem. For each host subsystem in the router, Junos OS automatically creates two internal Ethernet interfaces, **bcm0** and **em1**, for the two Gigabit Ethernet ports on the Routing Engine.

For more information about the management Ethernet interface and internal Ethernet interfaces on a TX Matrix Plus router and T1600 or T4000 LCCs configured in a routing matrix, see *Junos OS Network Interfaces Library for Routing Devices*.

Committing Configurations on the TX Matrix Plus Router

In a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers, all configuration must be performed on the TX Matrix Plus router. Any configuration you commit on a T1600 or a T4000 router is not propagated to the TX Matrix Plus router or other T1600 or T4000 routers. Only configuration changes you commit on the TX Matrix Plus router are propagated to all routers. A commit operation on the a TX Matrix Plus router overrides any changes you commit on a T1600 or a T4000 router.

If you issue the **commit** command, you commit the configuration to all the master Routing Engines in the routing matrix.

```
user@host# commit
sfc-re0:
configuration check succeeds
lcc0-re0:
commit complete
lcc1-re0:
commit complete
sfc-re0:
commit complete
```

NOTE: **If a commit operation fails on any node, then the commit operation is not completed for the entire routing matrix.**

If you issue the **commit synchronize** command on the TX Matrix Plus router, you commit the configuration to all the master and backup Routing Engines in the routing matrix.

```
user@host# commit synchronize
sfc-re0:
configuration check succeeds
lcc0-re1:
commit complete
lcc0-re0:
commit complete
lcc1-re1:
commit complete
lcc1-re0:
commit complete
sfc-re1:
commit complete
sfc-re0:
commit complete
```

Routing Matrix Configuration Groups

For routers that include two Routing Engines, you can specify two special group names—**re0** and **re1**. These two special group names apply to the Routing Engines in slots 0 and 1 of the TX Matrix Plus router. In addition, the routing matrix supports group names for the Routing Engines for each T1600 or T4000 router: **lcc*n*-re0** and **lcc*n*-re1**. ***n*** identifies a T1600 or T4000 router depending on the LCC configuration.

Routing Matrix System Log Messages

You configure the T1600 or T4000 routers to forward their system log messages to the TX Matrix Plus router at the **[edit system syslog host sfc0-master]** hierarchy level. For information about how to configure system log messages on a routing matrix based on a TX Matrix Plus router and T1600 or T4000 LCCs, see *Configuring System Logging for a TX Matrix Plus Router*.

Related Documentation

- Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 205
- TX Matrix Plus Router Chassis and Interface Names on page 182
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 207
- *Overview of a Routing Matrix with a TX Matrix Plus Router*

TX Matrix Plus Router Chassis and Interface Names

The output from some CLI commands uses the terms SFC and **sfc** (for *switch-fabric chassis*) to refer to the TX Matrix Plus router. Similarly the terms LCC, and **lcc** as a prefix (for *line-card chassis*) refer to a T1600 or T4000 router in a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers.

T1600 routers are assigned LCC index numbers, 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix. T1600 routers are assigned LCC index numbers, 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix. The current supported configuration of the routing matrix, can have up to eight T1600 routers, and each T1600 router has up to eight FPCs. Therefore, the routing matrix can have up to 64 FPCs (0 through 63). The FPCs are configured at the **[edit chassis lcc *number*]** hierarchy level.

In the Junos OS CLI, an interface name has the following format:

type-*fpc/pic/port*

When you specify the FPC number, the Junos OS determines which T1600 router contains the specified FPC based on the following assignment:

- On LCC 0, FPC hardware slots 0 through 7 correspond to FPC software numbers 0 through 7.
- On LCC 1, FPC hardware slots 0 through 7 correspond to FPC software numbers 8 through 15.
- On LCC 2, FPC hardware slots 0 through 7 correspond to FPC software numbers 16 through 23.
- On LCC 3, FPC hardware slots 0 through 7 correspond to FPC software numbers 24 through 31.

- On LCC 4, FPC hardware slots 0 through 7 correspond to FPC software numbers 32 through 39.
- On LCC 5, FPC hardware slots 0 through 7 correspond to FPC software numbers 40 through 47.
- On LCC 6, FPC hardware slots 0 through 7 correspond to FPC software numbers 48 through 55.
- On LCC 7, FPC hardware slots 0 through 7 correspond to FPC software numbers 56 through 63.

To convert FPC numbers in the T1600 routers to the correct FPC in a routing matrix, use the conversion chart shown in Table 18 on page 183. You can use the converted FPC number to configure the interfaces on the TX Matrix Plus router in your routing matrix.

Table 18: T1600 Router to Routing Matrix FPC Conversion Chart

FPC Numbering	T1600 Routers							
	LCC 0							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	0	1	2	3	4	5	6	7
	LCC 1							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	8	9	10	11	12	13	14	15
	LCC 2							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	16	17	18	19	20	21	22	23
	LCC 3							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	24	25	26	27	28	29	30	31
	LCC 4							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	32	33	34	35	36	37	38	39
	LCC 5							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7

Table 18: T1600 Router to Routing Matrix FPC Conversion Chart *(continued)*

FPC Numbering	T1600 Routers							
Routing Matrix FPC Slots Equivalent	40	41	42	43	44	45	46	47
	LCC 6							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	48	49	50	51	52	53	54	55
	LCC 7							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	56	57	58	59	60	61	62	63

For example, in a routing matrix that contains **lcc 0** through **lcc 2**, **so-20/0/1** refers to FPC slot **4** of **lcc 2**.

T4000 routers are assigned LCC index numbers, 0, 2, 4, and 6 when T4000 routers are connected to a TX Matrix Plus router in a routing matrix. The current supported configuration of the routing matrix, can have up to four T4000 routers, and each T4000 router has up to eight FPCs. Therefore, the routing matrix can have up to 32 FPCs (0 through 63). The odd numbered LCCs and the FPC slots of these LCCs are unused, when T4000 routers are connected to TX Matrix Plus router in a routing matrix. The FPCs are configured at the **[edit chassis lcc *number*]** hierarchy level.

In the Junos OS CLI, an interface name has the following format:

type-*fpc/pic/port*

When you specify the FPC number, the Junos OS determines which T4000 router contains the specified FPC based on the following assignment:

- On LCC 0, FPC hardware slots 0 through 7 correspond to FPC software numbers 0 through 7.
- On LCC 2, FPC hardware slots 0 through 7 correspond to FPC software numbers 16 through 23.
- On LCC 4, FPC hardware slots 0 through 7 correspond to FPC software numbers 32 through 39.
- On LCC 6, FPC hardware slots 0 through 7 correspond to FPC software numbers 48 through 55.

To convert FPC numbers in the T4000 routers to the correct FPC in a routing matrix, use the conversion chart shown in Table 19 on page 185. You can use the converted FPC number to configure the interfaces on the TX Matrix Plus router in your routing matrix.

Table 19: T4000 Router to Routing Matrix FPC Conversion Chart

FPC Numbering	T4000 Routers							
	LCC 0							
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	0	1	2	3	4	5	6	7
	LCC 2							
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	16	17	18	19	20	21	22	23
	LCC 4							
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	32	33	34	35	36	37	38	39
	LCC 6							
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	48	49	50	51	52	53	54	55

Related Documentation

- TX Matrix Plus Router Configuration Overview on page 178
- Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 205
- Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 206

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 17 on page 177.

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 191.

Related Documentation

- TX Matrix Router and T640 Router Configuration Overview on page 173
- TX Matrix Router Chassis and Interface Names on page 176
- Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 190
- Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 191

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
```

In the TX Matrix routing environment, use the **request chassis sib (offline | online)** command sequence to power cycle the newly installed 2.0 SIBs. Power cycling is not needed in a single chassis T640 environment.

```
user@host> request chassis sib offline slot slot-number
user@host> request chassis sib online slot slot-number
```

As the system discovers each new board, the 2.0 ASIC enables 2.0 features, and the upgrade is complete.

Configuring the Junos OS to Downgrade Switch Interface Boards on a TX Matrix Router

To downgrade your 2.0 SIBs to 1.0 SIBs, follow the upgrade procedure. When you replace the first 2.0 SIB with a 1.0 SIB, the system operates in a downgraded 1.0 mode until all 2.0 SIBs are replaced, and the newly installed 1.0 SIBs are power cycled using a **request chassis sib (offline | online)** command sequence.

NOTE: The TX Matrix switch fabric supports 2.0 SIBs for enabling Gigabit FPC-4 and Type 4 PICs. Gigabit FPC-4 devices are not compatible with 1.0 SIBs. Therefore, if you are planning to downgrade from 2.0 SIBs to 1.0 SIBs, you must take all Gigabit FPC-4 devices offline to ensure that the link between the new SIBs and the FPC does not fail.

Related Documentation

- TX Matrix Router and T640 Router Configuration Overview on page 173
- Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 189

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 173
- Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 189

FIB Localization Overview

On Juniper Networks routers, the forwarding table on the Packet Forwarding Engine, also referred to as forwarding information base (FIB), maintains the complete set of active IPv4 (inet) and IPv6 (inet6) routes. In Junos OS Release 11.4 and later, you can configure FIB localization for a Packet Forwarding Engine. FIB-localization characterizes Packet Forwarding Engines in a router as either “FIB-remote” or “FIB-local”.

FIB-local Packet Forwarding Engines install all routes from the default inet and inet6 route tables into the Packet Forwarding Engine forwarding hardware. FIB-remote Packet Forwarding Engines do not install all the routes for the inet and inet6 routing tables. However, they do maintain local and multicast routes.

FIB-remote Packet Forwarding Engines create a default (0/0) route in the Packet Forwarding Engine forwarding hardware for the inet and inet6 table. The default route references a next-hop or a unilist of next-hops that identify the FIB-local Packet Forwarding Engines that can perform full IP table lookups for received packets.

FIB-remote Packet Forwarding Engines forward received packets to the set of FIB-local Packet Forwarding Engines. The FIB-local Packet Forwarding Engines then perform full IP longest-match lookup on the destination address and forward the packet appropriately. The packet might be forwarded out of an egress interface on the same FIB-local Packet Forwarding Engine that performed the lookup or an egress interface on a different FIB-local or FIB-remote Packet Forwarding Engine. The packet might also be forwarded out of an FPC where FIB localization is not configured. The packet might also be received locally at the Routing Engine.

When FIB localization is configured on a router with some Flexible PIC Concentrators (FPCs) being FIB-remote and some others being FIB-local, packets arriving on the interface of the FIB-remote FPC are forwarded to one of the FIB-local FPCs for route lookup and forwarding.

The advantage of configuring FIB localization is that it enables upgrading the hardware forwarding table capacity of FIB-local Packet Forwarding Engines while not requiring upgrades to the FIB-remote Packet Forwarding Engines. In a typical network deployment, FIB-local Packet Forwarding Engines are core-facing, while FIB-remote Packet Forwarding Engines are edge-facing. The FIB-remote Packet Forwarding Engines also load-balance traffic over the available set of FIB-local Packet Forwarding Engines.

FIB localization is currently supported on T320, T640, T1600, and MX Series routers.

Related Documentation

- Example: Configuring Packet Forwarding Engine FIB Localization on page 194

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, T1600, and MX Series routers.

Example: Configuring Packet Forwarding Engine FIB Localization

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

Requirements

Before you begin:

1. Configure device interfaces and loopback interface addresses.
2. Configure static routes.
3. Configure OSPF and OSPFv3 and make sure that OSPF adjacencies and OSPF routes to loopback addresses are established.

This example uses the following hardware and software components:

- A T320, T640,T1600, or MX Series router.
- Junos OS Release 11.4 or later running on the router for T-Series routers. Junos OS Release 12.3 or later running on the router for MX Series routers..

Overview

In this example, you configure the chassis for IPv4 and IPv6 routes and FIB localization on Router R0 and then configure the edge-facing Packet Forwarding Engines on FPC0 as **fib-remote** and the core-facing Packet Forwarding Engines on FPC1 and FPC2 as **fib-local**. You then configure a routing policy named **fib-policy** with the **no-route-localize** option to ensure that all routes from a specified route filter are installed on the FIB-remote FPC.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

R0

```
set chassis fpc 0 route-localization fib-remote
set chassis fpc 1 route-localization fib-local
set chassis fpc 2 route-localization fib-local
set chassis route-localization inet
set chassis route-localization inet6
set policy-options policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
set policy-options policy-statement fib-policy term a then no-route-localize
set policy-options policy-statement fib-policy term b from route-filter fec0:4444::4/128
  exact
set policy-options policy-statement fib-policy term b then no-route-localize
set policy-options policy-statement fib-policy then accept
set routing-options forwarding-table export fib-policy
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see the *CLI User Guide*.

To configure Packet Forwarding Engine FIB localization:

1. Configure route localization or FIB localization for IPv4 and IPv6 traffic.

```
[edit chassis]
user@R0# set route-localization inet
user@R0# set route-localization inet6
```

2. Configure the Packet Forwarding Engine of an FPC as either **fib-local** or **fib-remote**.

```
[edit chassis]
user@R0# set fpc 0 route-localization fib-remote
user@R0# set fpc 1 route-localization fib-local
user@R0# set fpc 2 route-localization fib-local
```

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

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

4. Enable the routing policy in the forwarding table by configuring the forwarding table with the **fib-policy** statement.

```
[edit routing-options]
user@R0# set forwarding-table export fib-policy
```

NOTE: At least, one Packet Forwarding Engine must be configured as **fib-local** for the commit operation to be successful. If you do not configure **fib-local** for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

Results From configuration mode, confirm your configuration by entering the **show chassis** and **show policy-options** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@R0# show chassis
fpc 0 {
  route-localization fib-remote;
}
fpc 1 {
  route-localization fib-local;
}
fpc 2 {
  route-localization fib-local;
}
route-localization {
  inet;
  inet6;
}
```

```
user@R0# show policy-options
policy-statement fib-policy {
  term a {
    from {
      route-filter 4.4.4.4/32 exact;
    }
    then no-route-localize;
  }
  term b {
    from {
      route-filter fec0:4444::4/128 exact;
    }
    then no-route-localize;
  }
  then accept;
  }
}
```

Verification

Confirm that the configuration is working properly.

- Verifying Policy Configuration on page 196
- Verifying FIB-Localization Configuration on page 197
- Verifying Routes After the Policy Is Applied on page 197

Verifying Policy Configuration

Purpose Verify that the configured policy exists.

Action Issue the **show policy fib-policy** command to check that the configured policy *fib-policy* exists.

```
user@R0> show policy fib-policy
Policy fib-policy:
    Term a:
```



```
        from
            route filter:
                4.4.4.4/32 exact
        then no-route-localize
    Term b:
        from
            route filter:
                fec0:4444::4/128 exact
        then no-route-localize
    Term unnamed:
        then accept
```

Verifying FIB-Localization Configuration

Purpose Verify FIB-localization configuration details by using the **show route localization** and **show route localization detail** commands.

Action

```
user@R0> show route localization
FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
  FIB-local:  FPC2(4,5)
  FIB-remote: FPC0, FPC1
  Normal:     FPC3, FPC4, FPC5, FPC6, FPC7

user@R0> show route localization detail
FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
  FIB-local:  FPC2(4,5)
  FIB-remote: FPC0, FPC1
  Normal:     FPC3, FPC4, FPC5, FPC6, FPC7
FIB localization configuration
  Protocols:  inet, inet6
  FIB-local:  FPC2
  FIB-remote: FPC0, FPC1
Forwarding Engine addresses
  FPC0: 1
  FPC1: 2
  FPC2: 4, 5
  FPC3: 6
  FPC4: 8
  FPC5: 11
  FPC6: 13
  FPC7: 15
```

Verifying Routes After the Policy Is Applied

Purpose Verify that routes with the **no-route-localize** policy option are installed on the fib-remote FPC.

Action `user@R0>` **show route 4.4.4.4/32 extensive**

```
inet.0: 30 destinations, 30 routes (29 active, 0 holddown, 1 hidden)
4.4.4.4/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 4.4.4.4/32 -> {130.168.0.2 Flags no-localize}
                                          ^^^^^^^^^^^^^^^^^
        *Static Preference: 5
                Next hop type: Router, Next hop index: 629
                Next-hop reference count: 3
                Next hop: 130.168.0.2 via ge-1/0/4.0, selected
                State: <Active Int="">
       Age: 10:33
       Task: RT
       Announcement bits (1): 0-KRT
       AS path: I</Active
>
```

Configuration Statements

fib-local

Syntax fib-local;

Hierarchy Level [edit chassis fpc *fpc-number* route-localization]

Release Information Statement introduced in Junos OS Release 11.4.

Description Configure the Packet Forwarding Engine on an FPC as FIB-local.

NOTE: At least, one Packet Forwarding Engine must be configured as **fib-local** for the commit operation to be successful. If you do not configure **fib-local** for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

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

fib-remote

Syntax fib-remote;

Hierarchy Level [edit chassis fpc *fpc-number* route-localization]

Release Information Statement introduced in Junos OS Release 11.4.

Description Configure the Packet Forwarding Engine on an FPC as FIB-remote.

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

no-route-localize

Syntax no-route-localize;

Hierarchy Level [edit policy-options policy-statement *policy-name* term *term-name* then]

Release Information Statement introduced in Junos OS Release 11.4.

Description Enforce installation of routes on all FIB-remote Packet Forwarding Engines.

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

route-localization

Syntax

```
route-localization {
  inet;
  inet6;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 11.4.

Description Configure FIB localization for IPv4 and IPv6 routes.

Options **inet**—Configure FIB localization for IPv4 routes.

inet6—Configure FIB localization for IPv6 routes.

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

Example: Configuring Packet Forwarding Engine FIB Localization

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

- Requirements on page 200
- Overview on page 200
- Configuration on page 200
- Verification on page 202

Requirements

Before you begin:

1. Configure device interfaces and loopback interface addresses.
2. Configure static routes.
3. Configure OSPF and OSPFv3 and make sure that OSPF adjacencies and OSPF routes to loopback addresses are established.

This example uses the following hardware and software components:

- A T320, T640,T1600, or MX Series router.
- Junos OS Release 11.4 or later running on the router for T-Series routers. Junos OS Release 12.3 or later running on the router for MX Series routers..

Overview

In this example, you configure the chassis for IPv4 and IPv6 routes and FIB localization on Router R0 and then configure the edge-facing Packet Forwarding Engines on FPC0 as **fib-remote** and the core-facing Packet Forwarding Engines on FPC1 and FPC2 as **fib-local**. You then configure a routing policy named **fib-policy** with the **no-route-localize** option to ensure that all routes from a specified route filter are installed on the FIB-remote FPC.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

R0

```
set chassis fpc 0 route-localization fib-remote
set chassis fpc 1 route-localization fib-local
set chassis fpc 2 route-localization fib-local
set chassis route-localization inet
set chassis route-localization inet6
set policy-options policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
set policy-options policy-statement fib-policy term a then no-route-localize
set policy-options policy-statement fib-policy term b from route-filter fec0:4444::4/128
  exact
set policy-options policy-statement fib-policy term b then no-route-localize
```

```
set policy-options policy-statement fib-policy then accept
set routing-options forwarding-table export fib-policy
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see the *CLI User Guide*.

To configure Packet Forwarding Engine FIB localization:

1. Configure route localization or FIB localization for IPv4 and IPv6 traffic.

   ```
   [edit chassis]
   user@R0# set route-localization inet
   user@R0# set route-localization inet6
   ```

2. Configure the Packet Forwarding Engine of an FPC as either **fib-local** or **fib-remote**.

   ```
   [edit chassis]
   user@R0# set fpc 0 route-localization fib-remote
   user@R0# set fpc 1 route-localization fib-local
   user@R0# set fpc 2 route-localization fib-local
   ```

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

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

4. Enable the routing policy in the forwarding table by configuring the forwarding table with the **fib-policy** statement.

   ```
   [edit routing-options]
   user@R0# set forwarding-table export fib-policy
   ```

NOTE: At least, one Packet Forwarding Engine must be configured as fib-local for the commit operation to be successful. If you do not configure fib-local for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

Results

From configuration mode, confirm your configuration by entering the **show chassis** and **show policy-options** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@R0# show chassis
fpc 0 {
  route-localization fib-remote;
}
fpc 1 {
```



```
    route-localization fib-local;
  }
  fpc 2 {
    route-localization fib-local;
  }
  route-localization {
    inet;
    inet6;
  }
```

```
user@R0# show policy-options
policy-statement fib-policy {
  term a {
    from {
      route-filter 4.4.4.4/32 exact;
    }
    then no-route-localize;
  }
  term b {
    from {
      route-filter fec0:4444::4/128 exact;
    }
    then no-route-localize;
  }
  then accept;
  }
}
```

Verification

Confirm that the configuration is working properly.

- Verifying Policy Configuration on page 202
- Verifying FIB-Localization Configuration on page 203
- Verifying Routes After the Policy Is Applied on page 203

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 192
- fib-local on page 198
- fib-remote on page 199
- no-route-localize on page 199
- route-localization on page 199

CHAPTER 6

Configuring TX Matrix Plus Chassis-Level Features

Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix

A routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers supports the same chassis configuration statements as a standalone router (except **ce1**, **ct3**, **mlfr-uni-nni-bundles**, **sparse-dlcis**, and **vtmapping**). By including the **lcc** statement at the **[edit chassis]** hierarchy level, you configure PIC-specific features, such as framing, on specific T1600 or T4000 routers. In addition, a TX Matrix Plus router has two more chassis configuration statements, **online-expected** and **offline**.

To configure a T1600 router that is connected to a TX Matrix Plus router, include the **lcc** statement at the **[edit chassis]** hierarchy level:

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

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

To configure a T1600 or T4000 router within a routing matrix, include the following statements at the **[edit chassis lcc *number*]** hierarchy level:

```
[edit chassis lcc number]
fpc slot-number { # Use the hardware FPC slot number
pic pic-number {
  atm-cell-relay-accumulation;
  atm-l2circuit-mode (cell | aal5 | trunk trunk);
  framing (sdh | sonet);
  idle-cell-format {
    itu-t;
    payload-pattern payload-pattern-byte;
  }
  max-queues-per-interface (8 | 4);
  no-concatenate;
}
offline;
online-expected;
q-pic-large-buffer {
  large-scale;
}
```

NOTE: For the FPC slot number, specify the actual hardware slot number (numbered 0 through 7) as labeled on the T1600 or T4000 router chassis. Do not use the corresponding software FPC number shown in the "TX Matrix Plus Router Chassis and Interface Names" on page 182.

For information about how to configure the **online-expected** and **offline** configuration statements, see "Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline" on page 206.

Related Documentation

- TX Matrix Plus Router Configuration Overview on page 178
- TX Matrix Plus Router Chassis and Interface Names on page 182
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 207

Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline

By default, the Junos OS enables all the T1600 or T4000 routers in the routing matrix to come online. The Junos OS also enables you to configure all the T1600 or T4000 routers so that if they do not come online, an alarm is sent by the TX Matrix Plus router.

To configure this alarm, include the **online-expected** statement at the **[edit chassis lcc *number*]** hierarchy level:

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



```
online-expected;
```

If you do not want a T1600 or T4000 router to be part of the routing matrix, you can configure it to be offline. This is useful when you are performing maintenance on a T1600 or T4000 router. When the T1600 or T4000 router is ready to come back online, delete the **offline** configuration statement.

To configure a T1600 or T4000 router so that it is offline, include the **offline** statement at the **[edit chassis lcc *number*]** hierarchy level:

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

NOTE: If you do not configure the online-expected or offline statement, any T1600 or T4000 router that is part of the routing matrix is allowed to come online. However, if a T1600 or T4000 router does not come online, the TX Matrix Plus router does not generate an alarm.

Related Documentation

- TX Matrix Plus Router Configuration Overview on page 178
- Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 205
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 207

Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform

This topic provides an overview of the T1600 router configuration in order to upgrade it to the LCC0 of a newly configured TX Matrix Plus router. The routing matrix with TX Matrix Plus router consists of one TX Matrix Plus router that acts as the switch-fabric chassis (SFC) and from one to four T1600 routers that act as the line-card chassis (LCC). To perform the in-service upgrade, manually upgrade the Switch Interface Boards (SIBs), Control Boards (CBs) and Routing Engines of the T1600 router, and connect the upgraded T1600 router to the corresponding components of the TX Matrix Plus router with fiber-optic cables. When the SIBs of the T1600 router are upgraded and the data plane connection between the SFC and LCC is set up, the traffic flows in and out of the TX Matrix Plus routing platform through the data plane. When you upgrade the Routing Engines and CBs, the control plane connectivity between the SFC and LCC is set up. For information about the hardware and the installation requirements, see the *TX Matrix Plus Router Hardware Guide*.

This section discusses the following procedures to upgrade a standalone T1600 router to the LCC0 of a TX Matrix Plus routing platform:

- Preparing the Configuration File and Upgrading the Junos OS on the T1600 Router and SFC on page 208
- Configuring the Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC on page 208
- Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity on page 210
- Changing the Management Ethernet Interface Name for the T1600 Router on page 210
- Transferring Control of the T1600 Router (LCC0) to the SFC on page 210
- Adding a New T1600 Router to the TX Matrix Plus Routing Platform on page 211
- Downgrading a T1600 Router from the LCC of a TX Matrix Routing Platform to a Standalone T1600 Router on page 211

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 210.
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 208.
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 208.

   b. Manually set the M/S switch to single-chassis on the T1600 router on both CBs.

   c. Reboot both the master and backup Routing Engines on the T1600.

2. Downgrade the SIBs of the LCC and remove the data plane connections:

   a. Take the spare SIB-TXP-T1600 on the LCC offline by issuing the **request chassis sib slot *slot-number* offline** command.

      user@host> **request chassis sib slot 0 offline**

   b. Remove the data plane connections from the SIB-TXP-T1600 to the SFC.

   c. Replace the SIB-TXP-T1600 with SIB-I-T1600 and bring it online.

   d. Repeat these steps for all SIB-TXP-T1600s.

3. Remove the control plane connectivity by disconnecting the Ethernet cables of the control plane from the T1600 router to the SFC.

The LCC becomes a standalone T1600 router out of the TX Matrix Plus routing platform.

Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs

This topic describes how to configure Junos OS when you upgrade a T1600 router to LCC 0 of a TX Matrix Plus router with 3D SIBs. A routing matrix with a TX Matrix Plus router consists of one TX Matrix Plus router that acts as the switch-fabric chassis (SFC) and up to eight T1600 routers, or up to four T4000 routers, or a mix of T1600 and T4000 routers that act as the line-card chassis (LCCs). To perform the in-service upgrade, manually upgrade the Switch Interface Boards (SIBs), Control Boards (CBs), and Routing Engines of the T1600 router, and connect the upgraded T1600 router to the corresponding components of the TX Matrix Plus router with fiber-optic cables. When the SIBs of the T1600 router are upgraded and the data plane connection between the SFC and LCC is set up, the traffic flows in and out of the TX Matrix Plus router through the data plane. For information about the hardware and the installation requirements, see the TX Matrix Plus Hardware Guide.

This topic discusses the following procedures to upgrade a standalone T1600 router to LCC 0 of a TX Matrix Plus routing matrix and to configure Junos OS on the LCC and the SFC for the upgrade. The Junos OS configuration includes setting the LCC mode and training and verifying the links between the LCC and the SFC.

NOTE:

- The upgraded LCC becomes LCC 0.
- In-service upgrade for a standalone LCC applies only for the first standalone LCC becoming part of the routing matrix.
- No other LCC must be already connected to the SFC.

Preparing the Configuration File and Upgrading Junos OS on the T1600 Router and the SFC

To prepare the configuration file and upgrade the Junos OS:

1. Save and archive a copy of the active configuration of Junos OS on the T1600 router.
2. Update the active configuration to make it applicable to the LCC 0.
3. Transfer the modified configuration file that you have prepared to an intermediate server on the out-of-band management network accessible by the standalone router and the TX Matrix Plus router.
4. Transfer the configuration file to the SFC (to be applied later).

5. Upgrade the T1600 router with Junos OS Release 13.2 or later, and reboot.
6. Upgrade the SFC with Junos OS Release 13.2 or later, and reboot.

Configuring Junos OS for Upgrading the SIBs on the T1600 Router and Connecting It to the SFC

To upgrade and integrate a T1600 router to LCC 0 of the routing matrix with 3D SIBs perform the following tasks:

Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T1600 Router for Control Plane Connectivity

For control plane connectivity, upgrade the Control Boards (CBs), and Routing Engines of the T1600 router by replacing the T-CBs with LCC-CBs, and RE 2000 with LCC-RE. Replace the power entry module (PEM) with PWR-T-6-60-DC-BB and the rear fan tray with FAN-R-TXP-3D-LCC. See the TX Matrix Plus Hardware Guide for the installation procedures.

Preparing the SFC and the LCC for the Upgrade

To prepare the SFC and the LCC for the upgrade:

1. Use the **show pfe statistics traffic** command to verify that the level of traffic on each Packet Forwarding Engine in the LCC is within the recommended range for upgrade (which is approximately 50% of line rate).
2. Use the **show chassis fabric plane** command to verify that four planes are active and one plane is spare.

```
user@host> show chassis fabric plane
Plane State Uptime
0 Online 15 hours, 42 minutes, 9 seconds
1 Online 15 hours, 42 minutes, 9 seconds
2 Spare
3 Online 15 hours, 42 minutes, 9 seconds
4 Online 15 hours, 42 minutes, 9 seconds
```

3. a. Ensure that the **CONFIG-SIZE** dial on the SFC is set to **3** and all the SIBs are online before configuring the **upgrade-mode** statement.

   b. Configure the upgrade mode on the LCC by using the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the changes. This configuration enables the T1600 chassis to be upgraded with the TXP-3D-LCC SIBs.

   [edit chassis]
   user@host# **set fabric upgrade-mode 3d-fabric**
   user@host# **commit**

This step also checks for the compatibility of Routing Engines, CBs, and FPCs.

NOTE:
The following FPCs are not supported:

- T640-FPC1-E and T640-FPC1-E2
- T640-FPC2, T640-FPC2-E, and T640-FPC2-E2
- T640-FPC3, T640-FPC3-E, and T640-FPC3-E2
- T640-FPC4-1P-ES

c. Configure the upgrade mode on the SFC by including the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the configuration on the SFC.

```
[edit chassis]
user@host# set fabric upgrade-mode 3d-fabric
user@host# commit
```

4. Set the LCC mode on the SFC's master Routing Engine to **t1600**:

```
[edit chassis]
user@host# set lcc-mode lcc 0 mode t1600
user@host# commit
```

Confirm that the output of **show chassis hardware** on LCC indicates that the chassis is T1600.

Upgrading the SIBs

You must upgrade the existing SIBs on the LCC to 3D SIBs for the LCC to operate as LCC 0 in the routing matrix of the TX Matrix Plus router with 3D SIBs. To upgrade the SIBs on the LCC follow these steps:

1. Verify that the same planes are spare on the SFC and the LCC by using the **show chassis fabric plane** command. If the same planes are not **spare**, use the **request chassis fabric plane** command to change the states of the required planes.

   The output of **show chassis fabric plane** command must show four active planes on the SFC and the LCC. Spare plane numbers must be identical on the SFC and the LCC.

2. Take the spare SIB-I-T1600 offline by issuing the **request chassis sib slot *slot-number* offline** command.
3. Replace the offline SIB-I-T1600 on the T1600 with SIB-TXP-3D-LCC. See Replacing the SIB for the replacement procedure.
4. Connect the SIBs on the LCC to the SIBs on the SFC by using fiber-optic cables. See Connecting the Switching Plane Cables for the connection procedure.
5. Bring the replaced SIB-TXP-3D-LCC online by issuing the **request chassis sib slot *slot-number* online** command.

For example, for plane 0:

user@host> **request chassis sib slot 0 online**

6. Issue the **show chassis fabric optics** command to verify that all the cables are in **CABLE_CONNECTED** state on the SFC and the LCC.

```
user@host> show chassis fabric optics
Port      Cable state            Module Type
lcc0-sib0:
0         CABLE_CONNECTED        AOC
1         CABLE_CONNECTED        AOC
2         CABLE_CONNECTED        AOC
3         CABLE_CONNECTED        AOC
4         CABLE_CONNECTED        AOC
5         CABLE_CONNECTED        AOC
6         CABLE_CONNECTED        AOC
7         CABLE_CONNECTED        CXP Module
lcc0-sib1:
0         CABLE_CONNECTED        CXP Module
1         CABLE_NOT_CONNECTED    AOC
2         CABLE_CONNECTED        AOC
...
```

Until all mandatory cables show the **CABLE_CONNECTED** state, do not proceed to the next step.

NOTE: In a T1600 LCC, the mandatory cables 0, 2, 4, and 6 must be in the **CABLE_CONNECTED** state.

7. Verify that the newly inserted SIB is in **Spare** state and there are no alarms due to faulty hardware by using the **show chassis sibs** and **show chassis alarms** commands. Until the SIB shows the **Spare** state, and there are no alarms, do not proceed to train the switching plane links.

Training the Switching Plane Links

For the SIBs on the LCC and the SFC to communicate with each other, the links are trained using the **train-link-transmit** and **train-link-receive** commands on the LCC and the SFC. After the links are trained, they are verified using the **show chassis fabric optical-links**, **show chassis fabric plane extensive**, and **show chassis fabric topology** commands.

To manually train the link between the LCC and the SFC before the data plane is activated, perform the following steps:

1. For the SFC to receive traffic from the LCC, issue the **request chassis sib f13 slot *f13 slot* train-link-receive** command.

   f13 slot is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the LCC. The SFC's ***f13 slot*** has a value of 0, 3, 6, 8, or 11.

SIB Slots on the LCC	SIB Slots on the SFC
0	0
1	3
2	6
3	8
4	11

2. To train the links on the LCC to receive traffic from the SFC, issue the **request chassis sib slot *sibSlot* train-link-receive** command.

   sibSlot is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) on the SFC. You can configure the LCC's ***sibSlot*** to be a value in the range from 0 through 4.

3. To train the links on the SFC to transmit traffic to the LCC, issue the **request chassis sib f13 slot *f13 slot* train-link-transmit** command.

   f13 slot is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the T1600 router. ***f13 slot*** has a value of 0, 3, 6, 8, or 11.

4. To train the links on the LCC to transmit traffic to the SFC, issue the **request chassis sib slot *sibSlot* train-link-transmit** command.

   sibSlot is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) in the SFC. You can configure ***sibSlot*** to be a value in the range from 0 through 4.

5. Verify the links between the LCC and the SFC by using the following commands:

   - **show chassis fabric optical-links**
   - **show chassis fabric plane extensive**
   - **show chassis fabric topology**

6. If errors occur at this stage, take the SIB on the LCC offline and bring it back online. On the SFC, take the F13 SIB offline and bring it back online. Start training the links again.

Activating and Verifying the Switching Planes

To activate and verify the upgraded switching plane:

1. To activate the switching plane with the new SIB, take another switching plane offline:

   On the SFC, issue the **request chassis fabric plane *plane-num* offline sfc 0** command.

   On the LCC, issue the **request chassis sib slot *sibSlot* offline** command.

   For example, on the SFC:

   user@host# **request chassis fabric plane 1 offline sfc 0**

   On the LCC:

   user@host# **request chassis sib slot 1 offline**

2. Use the **show chassis fabric stats rates summary** command on the LCC and **show chassis fabric stats f13 *actPlaneSib1#* rates summary** command on the SFC to verify that the traffic is flowing through all the planes in the LCC and the SFC, respectively.

   If traffic is flowing smoothly, the statistics for **Data/sec** under **Received** and **Sent** shows a nonzero number.

3. Follow the procedures in "Upgrading the SIBs" on page 214, "Training the Switching Plane Links" on page 215, and "Activating and Verifying the Switching Planes" on page 217 for all the T1600 SIBs in the other planes.

Transferring Control of the T1600 Router (LCC 0) to the SFC

After upgrading the SIBs of a standalone T1600 router and integrating it into a routing matrix, transfer the control of the T1600 router to the SFC in the routing matrix:

1. On the SFC, confirm that the dial on the left, **CHASSIS ID**, displays **00**, and that on right, **CONFIG-SIZE**, displays **03**.

2. Connect the Ethernet links from the T1600 CBs to the connector interface panel (CIP) on the SFC. Verify that the Ethernet connection LED is lit on the CIP.

3. Manually set the **M/S** switch on both the replaced CBs of the T1600 router to **M** (multichassis).

4. Configure the T1600 router as LCC 0 by including the **lcc *number*** statement at the **[edit chassis]** hierarchy level.

   ```
   [edit chassis]
   user@host>set lcc number
   ```

5. When all the SIBs are upgraded, delete the **fabric upgrade-mode** statement from the configuration hierarchy, and commit the changes on both the LCC and the SFC.

   ```
   [edit chassis]
   user@host# delete chassis fabric upgrade-mode 3d-fabric
   user@host# commit
   ```

6. After you configure LCC 0, reboot it for the changes to take effect. Reboot the SFC also. This rebooting process establishes the forwarding state of the new LCC in the

TX Matrix Plus routing matrix by bringing up the SIBs automatically. For more information about hardware connectivity for the control plane, see the TX Matrix Plus Hardware Guide.

Adding a New T1600 Router to the TX Matrix Plus Routing Matrix

Junos OS does not support the in-service upgrade of T1600 routers to LCC 1 though LCC 7. To add a second LCC to the TX Matrix Plus routing matrix:

1. Upgrade both the CBs and Routing Engines on the T1600 router. For details, see "Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity" on page 210.
2. Upgrade the T1600 router with the same version of Junos OS as that on the SFC.
3. Upgrade the SIBs of the T1600 router and connect the new SIBs to the SFC. For details, see "Configuring Junos OS for Upgrading the SIBs on the T1600 Router and Connecting It to the SFC" on page 213.
4. Connect Ethernet links of the control plane from the T1600 router to the SFC.
5. Set the LCC mode on SFC's master Routing Engine to **t1600** by using the following commands:

   user@host# **set chassis lcc-mode lcc 0 mode t1600**
   user@host# **commit**

6. Reboot the T1600 router. After rebooting, the router becomes part of the TX Matrix Plus routing matrix and is connected to the SFC on the control plane.

Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs

This topic describes how to configure Junos OS when you upgrade a T4000 router to LCC 0 of a TX Matrix Plus router with 3D SIBs. A TX Matrix Plus routing matrix consists of one TX Matrix Plus router that acts as the switch-fabric chassis (SFC) and up to eight T1600 routers, or up to four T4000 routers, or a mix of T1600 and T4000 routers that act as the line-card chassis (LCCs). To perform the in-service upgrade, manually upgrade the Switch Interface Boards (SIBs), Control Boards (CBs), and Routing Engines of the T4000 router, and connect the upgraded T4000 router to the corresponding components of the TX Matrix Plus router with fiber-optic cables. When the SIBs of the T4000 router are upgraded and the data plane connection between the SFC and LCC is set up, the traffic flows in and out of the TX Matrix Plus router through the data plane. For information about the hardware and the installation requirements, see the TX Matrix Plus Hardware Guide.

This topic discusses the following procedures to upgrade a standalone T4000 router to LCC 0 of a TX Matrix Plus routing matrix and to configure Junos OS on the LCC and the SFC for the upgrade. The Junos OS configuration includes setting the LCC mode and training and verifying the links between the LCC and the SFC.

NOTE:

- The upgraded LCC becomes LCC 0.
- In-service upgrade for a standalone LCC applies only for the first standalone LCC that becomes part of the routing matrix.
- No other LCC must be already connected to the SFC.

Preparing the Configuration File and Upgrading Junos OS on the T4000 Router and the SFC

To prepare the configuration file and upgrade Junos OS:

1. Save and archive a copy of the active configuration of Junos OS on the T4000 router.
2. Update the active configuration to make it applicable to the LCC 0.
3. Transfer the modified configuration file that you have prepared to an intermediate server on the out-of-band management network accessible by the standalone router and the TX Matrix Plus router.
4. Transfer the configuration file to the SFC (to be applied later).
5. Upgrade the T4000 router with Junos OS Release 13.2 or later, and reboot.
6. Upgrade the SFC with Junos OS Release 13.2 or later, and reboot.

Configuring Junos OS for Upgrading the SIBs on the T4000 Router and Connecting the Router to the SFC

To upgrade and integrate a T4000 router to LCC 0 of the routing matrix with 3D SIBs, perform the following tasks:

Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T4000 Router for Control Plane Connectivity

For control plane connectivity, upgrade the Control Boards (CBs) and Routing Engines of the T4000 router by replacing the T-CBs with LCC-CBs, and RE 2000 with LCC-RE.

Replace the power entry module (PEM) with PWR-T-6-60-DC-BB and the rear fan tray with FAN-R-TXP-3D-LCC. See the TX Matrix Plus Hardware Guide for the installation procedures.

Preparing the SFC and the LCC for the Upgrade

To prepare the SFC and the LCC for the upgrade:

1. Use the **show pfe statistics traffic** command to verify that the level of traffic on each Packet Forwarding Engine in the LCC is within the recommended range for upgrade (which is approximately 50% of line rate).

2. Use the **show chassis fabric plane** command to verify that four data planes are active and one plane is spare.

```
user@host> show chassis fabric plane
Plane State Uptime
0 Online 15 hours, 42 minutes, 9 seconds
1 Online 15 hours, 42 minutes, 9 seconds
2 Spare
3 Online 15 hours, 42 minutes, 9 seconds
4 Online 15 hours, 42 minutes, 9 seconds
```

3. a. Ensure that the **CONFIG-SIZE** dial on the SFC is set to **3** and all the SIBs are online before configuring the **upgrade-mode** statement.

   b. Configure the upgrade mode on the LCC by using the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the changes. This configuration enables the T4000 chassis to be upgraded with the TXP-3D-LCC SIBs.

   [edit chassis]
   user@host# **set fabric upgrade-mode 3d-fabric**
   user@host# **commit**

   This step also checks for the compatibility of Routing Engines, CBs, and FPCs.

   NOTE:
   The following FPCs are not supported:

   - T640-FPC1-E and T640-FPC1-E2
   - T640-FPC2, T640-FPC2-E, and T640-FPC2-E2
   - T640-FPC3, T640-FPC3-E, and T640-FPC3-E2
   - T640-FPC4-1P-ES

   c. Configure the upgrade-mode on the SFC by including the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the configuration on the SFC.

   [edit chassis]
   user@host# **set fabric upgrade-mode 3d-fabric**
   user@host# **commit**

4. Configure the LCC mode on the SFC's master Routing Engine to **t4000**:


```
[edit chassis]
user@host# set lcc-mode lcc 0 mode t4000
user@host# set lcc-mode lcc 1 mode empty
user@host# commit
```

NOTE: If you configure **lcc-mode** for LCC 0, LCC 2, LCC 4, and LCC 6 as **t4000**, for the next LCC, **lcc-mode** must be **empty**— that is, **lcc-mode** for LCC 3, LCC 5, and LCC 7 must be **empty**.

Upgrading the SIBs

You must upgrade the existing SIBs on the LCC to 3D SIBs for the LCC to operate as LCC 0 in the routing matrix of the TX Matrix Plus router with 3D SIBs. To upgrade the SIBs on the LCC:

1. Verify that the same planes are spare on the SFC and the LCC by using the **show chassis fabric plane** command. If the same planes are not spare, use the **request chassis fabric plane** command to change the states of the required planes.

   The output of **show chassis fabric plane** command must show four active planes on the SFC and the LCC. Spare plane numbers must be identical on the SFC and the LCC.
2. Take the spare SIB-I-T4000 offline by issuing the **request chassis sib slot** ***slot-number*** **offline** command.
3. Replace the offline SIB-I-T4000 with SIB-TXP-3D-LCC. See the Replacing the SIB for the replacement procedure.
4. Connect the SIBs on the LCC to the SIBs on the SFC by using fiber-optic cables. See the Connecting the Switching Plane Cables for the connection procedure.
5. Bring the replaced SIB-TXP-3D-LCC online by issuing the **request chassis sib slot** ***slot-number*** **online** command.

   For example, for plane 0:

   ```
   user@host> request chassis sib slot 0 online
   ```
6. Issue the **show chassis fabric optics** command to verify that all the cables are in **CABLE_CONNECTED** state on the SFC and the LCC.

   ```
   user@host> show chassis fabric optics
   Port      Cable state           Module Type
   lcc0-sib0:
   0         CABLE_CONNECTED       AOC
   1         CABLE_CONNECTED       AOC
   2         CABLE_CONNECTED       AOC
   3         CABLE_CONNECTED       AOC
   4         CABLE_CONNECTED       AOC
   5         CABLE_CONNECTED       AOC
   6         CABLE_CONNECTED       AOC
   7         CABLE_CONNECTED       CXP Module
   lcc0-sib1:
   0         CABLE_CONNECTED       CXP Module
   1         CABLE_NOT_CONNECTED   AOC
   ```



```
2           CABLE_CONNECTED          AOC
...
```

Until all mandatory cables show the **CABLE_CONNECTED** state, do not proceed to the next step.

NOTE: **All the eight cables (0 through 7) on a SIB in the T4000 LCC 0 must be in CABLE_CONNECTED state.**

7. Verify that the newly inserted SIB is in **Spare** state and there are no alarms due to faulty hardware by using the **show chassis sibs** and **show chassis alarms** commands. Until the SIB shows the **Spare** state, and there are no alarms, do not proceed to train the switching plane links.

Training the Switching Plane Links

For the SIBs on the LCC and the SFC to communicate with each other, the links are trained using the **train-link-transmit** and **train-link-receive** commands on the LCC and the SFC. After the links are trained, they are verified using the **show chassis fabric optical-links, show chassis fabric plane extensive**, and **show chassis fabric topology** commands.

To manually train the link between the LCC and the SFC before the data plane is activated, perform these steps:

1. For the SFC to receive traffic from the LCC, issue the **request chassis sib f13 slot *f13 slot* train-link-receive** command.

   f13 slot is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the LCC. The SFC's ***f13 slot*** has a value of 0, 3, 6, 8, or 11.

SIB Slots on the LCC	SIB Slots on the SFC
0	0
1	3
2	6
3	8
4	11

2. To train the links on the LCC to receive traffic from the SFC, issue the **request chassis sib slot *sibSlot* train-link-receive** command.

   sibSlot is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) in the SFC. You can configure the LCC's ***sibSlot*** to be a value in the range from 0 through 4.

3. To train the links on the SFC to transmit traffic to the LCC, issue the **request chassis sib f13 slot *f13 slot* train-link-transmit** command.

   f13 slot is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the T4000 router. ***f13 slot*** has a value of 0, 3, 6, 8, or 11.

4. To train the links on the LCC to transmit traffic to the SFC, issue the **request chassis sib slot *sibSlot* train-link-transmit** command.

   sibSlot is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) in the SFC. You can configure ***sibSlot*** to be a value in the range from 0 through 4.

5. Verify the links between the LCC and the SFC by using the following commands:
   - **show chassis fabric optical-links**
   - **show chassis fabric plane extensive**
   - **show chassis fabric topology**

6. If errors occur at this stage, take the SIB on the LCC offline and bring it back online. On the SFC, take the F13 SIB offline and bring it back online. Start training the links again.

Activating and Verifying the Switching Plane

To activate and verify the upgraded switching plane:

1. To activate the switching plane with the new SIB, take another switching plane offline:

   On the SFC, issue the **request chassis fabric plane *plane-num* offline sfc 0** command.

   On the LCC, issue the **request chassis sib slot *sibSlot* offline** command.

   For example, on the SFC:

   user@host# request chassis fabric plane 1 offline sfc 0

   On the LCC:

   user@host# request chassis sib slot 1 offline

2. Use the **show chassis fabric stats rates summary** command on the LCC and **show chassis fabric stats f13 *actPlaneSib1#* rates summary** command on the SFC to verify that the traffic is flowing through all the planes in the LCC and the SFC, respectively.

   If traffic is flowing smoothly, the statistics for **Data/sec** under **Received** and **Sent** shows a nonzero number.

3. Follow the procedures in “Upgrading the SIBs” on page 221, “Training the Switching Plane Links” on page 222, and “Activating and Verifying the Switching Plane” on page 223 for upgrading all the T4000 SIBs in the other planes.

Transferring Control of the T4000 Router (LCC 0) to the SFC

After upgrading the SIBs of a standalone T4000 router and integrating it into a routing matrix, transfer the control of the T4000 router to the SFC in the routing matrix:

1. On the SFC, confirm that the dial on the left, **CHASSIS ID**, displays **00** and that on the right, **CONFIG-SIZE**, displays **03**.
2. Connect the Ethernet links from the T4000 CBs to the CIP on the SFC. Verify that the Ethernet connection LED is lit on the CIP.
3. Manually set the **M/S** switch on both the replaced CBs of the T4000 router to **M** (multichassis).
4. Configure the T4000 router as LCC 0 by including the **lcc *number*** statement at the **[edit chassis]** hierarchy level.

   ```
   [edit chassis]
   user@host>set lcc number
   ```

5. When all the SIBs are upgraded, delete the **fabric upgrade-mode** statement from the configuration hierarchy, and commit the changes on both the LCC and the SFC.

   ```
   [edit chassis]
   user@host# delete chassis fabric upgrade-mode 3d-fabric
   user@host# commit
   ```

6. After you configure LCC 0, reboot it for the changes to take effect. Reboot the SFC also. This rebooting process establishes the forwarding state of the new LCC in the TX Matrix Plus routing matrix by bringing up the SIBs automatically. For more information about hardware connectivity for the control plane, see the TX Matrix Plus Hardware Guide.

Adding a New T4000 Router to the TX Matrix Plus Routing Matrix

Junos OS does not support in-service upgrade of T4000 routers to LCC 2, LCC 4, and LCC 6. To add a second LCC to the TX Matrix Plus routing matrix:

NOTE: When you upgrade other T4000 routers to LCCs in the routing matrix, you must set the LCC number (*lcc-number*) to 2, 4, or 6.

1. Upgrade both the CBs and Routing Engines on the T4000 router. For details, see "Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T4000 Router for Control Plane Connectivity" on page 219.
2. Upgrade the T4000 router with the same version of Junos OS as that on the SFC.
3. Upgrade the SIBs of the T4000 router and connect the new SIBs to the SFC. For details, see "Configuring Junos OS for Upgrading the SIBs on the T4000 Router and Connecting the Router to the SFC" on page 219.
4. Connect Ethernet links of the control plane from the T4000 router to the SFC.

5. Set the LCC mode on the SFC's master Routing Engine to ***t4000*** by using the following commands:

   user@host# **set chassis lcc-mode lcc 0 mode t4000**
   user@host# **set chassis lcc-mode lcc 1 mode empty**
   user@host# **commit**

   NOTE: If you set **lcc-mode** for LCC 0, LCC 2, LCC 4, and LCC 6 as **t4000**, the **lcc-mode** value for the next LCC must be **empty**. **lcc-mode** for LCC 3, LCC 5, and LCC 7 must be **empty** in a routing matrix configuration with four T4000 LCCs.

6. Reboot the T4000 router. After rebooting, the router becomes part of the TX Matrix Plus routing matrix and is connected to the SFC on the control plane.

Configuring Junos OS to Upgrade the T640 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs

The procedure for upgrading a T640 router to LCC 0 of a TX Matrix Plus routing matrix is the same as the procedure for upgrading a T1600 router. See "Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs" on page 212.

Related Documentation

- Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 218
- Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 212

- *Upgrading an Operational Standalone Router and Integrating It into a TX Matrix Plus Routing Matrix with 3D SIBs*

CHAPTER 7

Configuring M Series Chassis-Level Features

Configuring Port-Mirroring Instances on M320 Routers

You can associate only one port-mirroring instance with a specific FPC on an M320 router.

To associate a port-mirroring instance with a specific FPC, include the **port-mirror-instance** ***port-mirroring-instance-name*** statement at the **[edit chassis fpc *slot-number*]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  port-mirror-instance port-mirroring-instance-name;
}
```

The properties of the port-mirroring instance associated with an FPC override any global port-mirroring properties (configured by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level.)

NOTE:

- Layer 2 VPLS port mirroring is supported only for Enhanced III FPCs on M320 routers.
- Ensure that the *port-mirroring-instance-name* specified at the **[edit chassis fpc *slot-number*]** hierarchy level matches the *port-mirroring-instance-name* configured at the **[edit forwarding-options port-mirroring instance *port-mirroring-instance-name*]** hierarchy level.

Related Documentation

- Port-Mirroring Instances Overview on page 8

Configuring Port-Mirroring Instances on M120 Routers

You can associate only one port-mirroring instance with a specific FEB on an M120 router.

To associate a port-mirroring instance with a FEB, include the **port-mirror-instance** ***port-mirroring-instance-name*** statement at the **[edit chassis feb *slot-number*]** hierarchy level:

```
[edit chassis]
feb slot-number {
  port-mirror-instance port-mirroring-instance-name;
}
```

The properties of the port-mirroring instance associated with the FEB override any global port-mirroring properties (configured by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level.)

NOTE: In a FEB redundancy group, you must associate a port-mirroring instance only with the primary FEB. During failover or switchover, the port-mirroring instance is automatically associated with the backup FEB that fails over or switches over as the primary FEB.

For information about configuring FPC-to-FEB connectivity on an M120 router, see “Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers” on page 231.

Related Documentation

- Port-Mirroring Instances Overview on page 8

Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers

By default, the maximum transmission unit (MTU) check for routing instance is disabled on M Series routers (except the M120 and M320 routers), and enabled for all T Series and J Series routers.

NOTE: The MTU check is automatically present for interfaces belonging to the main router.

On M Series routers (except the M120 and M320 routers) you can configure MTU path checks on the outgoing interface for unicast traffic routed on a virtual private network (VPN) routing and forwarding (VRF) routing instance. When you enable MTU check, the router sends an Internet Control Message Protocol (ICMP) message when the size of a unicast packet traversing a VRF routing instance or virtual-router routing instance has exceeded the MTU size and when an IP packet is set to "do not fragment". The ICMP message uses the routing instance local address as its source address.

For an MTU check to work in a routing instance, you must include the **vrf-mtu-check** statement at the **[edit chassis]** hierarchy level and assign at least one interface containing an IP address to the routing instance.

To configure path MTU checks, complete the following tasks:

1. Enabling MTU Check for a Routing Instance on page 229
2. Assigning an IP Address to an Interface in the Routing Instance on page 229

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 454

Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers

The M120 router supports six Forwarding Engine Boards (FEBs) and six Flexible PIC Concentrators (FPCs). The supported FPCs include:

- Two compact FPCs:
  - OC192 compact FPC (supported only on the D4 chip-based compact FPC)
  - 10-Gigabit Ethernet compact FPC
- Up to four Type 1, Type 2, or Type 3 FPCs

On the M120 router, you can map a connection between any FPC and any FEB. This capability allows you to configure resources for a chassis that contains empty slots, supporting configurations where the FPC and FEB pairs are not in slot order. You do not have to populate every empty slot position, but you must configure a FEB for every FPC.

If you do not want to map a connection between an FPC and a FEB, you must explicitly configure the FPC not to connect to the FEB. To do so, include the **none** option at the **[edit chassis fpc-feb-connectivity fpc *number* feb]** hierarchy level. If you do not configure FPC and FEB connectivity, it is automatically assigned in the following order: FPC 0 to FEB 0, FPC 1 to FEB 1, and so on.

For each FEB, you can map a maximum of two Type 1 FPCs or one Type 2, Type 3, or compact FPC.

The following restrictions apply when you configure FPC and FEB connectivity:

- When an FPC is configured not to connect to any FEB, interfaces on that FPC are not created.
- If a PIC comes online, but the FEB to which the FPC is configured to connect is not online, the physical interfaces for the PIC are not created. For example, PIC 1 on FPC 2 comes online. The configuration specifies that FPC 2 connects to FEB 3. If FEB 3 is not online at the time PIC 1 comes online, the physical interfaces corresponding to PIC 1 on FPC 2 are not created. If FEB 3 subsequently comes online, the physical interfaces are created.
- If a FEB is brought offline or removed, any interfaces on the FPCs connected to the FEB are deleted. If the FEB is subsequently brought back online, the interfaces are restored.
- FPCs and FEBs might reboot following a change in the FPC and FEB connectivity configuration. If an FPC connects to a different FEB as a result of the configuration change, the FPC is rebooted following the commit. As a result of the reboot, interfaces on the FPC are deleted.
- If a FEB connects to a different FPC or set of FPCs after a connectivity configuration change, the FEB is rebooted. The exception is if the FEB is already connected to one or two Type 1 FPCs and the change only results in the FEB being connected either to one additional or one fewer Type 1 FPC.

To configure a connection between an FPC and a FEB, include the **fpc-feb-connectivity** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
fpc-feb-connectivity {
  fpc number feb (slot-number | none);
}
```

For **fpc *number***, enter a value from 0 through 5. For **feb *slot-number***, enter a value from 0 through 5 or none. The **none** option disconnects the FPC from the FEB.

To view the current FPC and FEB mapping and the status of each FPC and FEB, issue the **show chassis fpc-feb-connectivity** operational mode command. For more information, see the CLI Explorer.

NOTE: FPC-to-FEB connectivity is supported only on the M120 router.

In this example, FPC 3 is already mapped to FEB 3 by default. You are also mapping a connection between FPC 2 and FEB 3.

```
[edit chassis]
fpc-feb-connectivity {
  fpc 2 feb 3;
}
```

However, this configuration results in a mismatch between the FPC type and the FEB type. For example, FPC 3 is not a Type 1 FPC. You can map only one FPC that is not a Type 1 FPC to a FEB. Use the **fpc-feb-connectivity** statement to explicitly disconnect FPC 3 from FEB 3. To do so, include the **none** option at the **[edit chassis fpc-feb-connectivity fpc *number* feb]** hierarchy level:


```
[edit chassis]
fpc-feb-connectivity {
  fpc 2 feb 3;
  fpc 3 feb none;
}
```

Related Documentation

- Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 307
- Configuring Port-Mirroring Instances on M120 Routers on page 228

Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers

By default, IQ PICs on T Series and M320 routers are restricted to a maximum of four egress queues per interface. To configure a maximum of eight egress queues on IQ interfaces, include the **max-queues-per-interface** statement at the **[edit chassis fpc *slot-number* pic *pic-number*]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
max-queues-per-interface (8 | 4);
```

On a TX Matrix or TX Matrix Plus router, include the **max-queues-per-interface** statement at the **[edit chassis lcc *number* fpc *slot-number* pic *pic-number*]** hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number]
max-queues-per-interface (8 | 4);
```

NOTE: **The configuration at the [edit class-of-service] hierarchy level must also support eight queues per interface.**

The maximum number of queues per IQ PIC can be 4 or 8. If you include the **max-queues-per-interface** statement, all ports on the IQ PIC use configured mode and all interfaces on the IQ PIC have the same maximum number of queues.

If you include the **max-queues-per-interface 4** statement, you can configure all four ports and configure up to four queues per port.

For 4-port OC3c/STM1 Type I and Type II PICs on M320 and T Series routers, when you include the **max-queues-per-interface 8** statement, you can configure up to eight queues on ports 0 and 2. After you commit the configuration, the PIC goes offline and comes back online with only ports 0 and 2 operational. No interfaces can be configured on ports 1 and 3.

For Quad T3 and Quad E3 PICs, when you include the **max-queues-per-interface 8** statement, you can configure up to eight queues on ports 0 and 2. After you commit the configuration, the PIC goes offline and comes back online with only ports 0 and 2 operational. No interfaces can be configured on ports 1 and 3.

When you include the **max-queues-per-interface** statement and commit the configuration, all physical interfaces on the IQ PIC are deleted and readded. Also, the PIC is taken offline and then brought back online immediately. You do not need to take the PIC offline and online manually. You should change modes between four queues and eight queues only when there is no active traffic going to the IQ PIC.

Related Documentation

- Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 280
- Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 282

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 227
- Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 307
- Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 233

CHAPTER 8

Configuring MX Series Chassis-Level Features

Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers

You can configure port-mirroring instances both at the DPC level and at the PIC level on MX Series routers, as described in the following topics:

- Configuring Port-Mirroring Instances at the DPC Level on page 236
- Configuring Port-Mirroring Instances at the PIC Level on page 236

Configuring Port-Mirroring Instances at the DPC Level

A port-mirroring instance configured at the FPC level for the DPC is bound to all the Packet Forwarding Engines on the DPC.

To associate a port-mirroring instance with a specific DPC and its Packet Forwarding Engines, include the **port-mirror-instance *port-mirroring-instance-name*** statement at the **[edit chassis fpc *slot-number*]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  port-mirror-instance port-mirroring-instance-name;
}
```

The properties of the port-mirroring instance associated with the DPC override any global port-mirroring properties (configured by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level).

Configuring Port-Mirroring Instances at the PIC Level

For MX Series routers, there is a one-to-one mapping of Packet Forwarding Engines and PICs. Therefore, a port-mirroring instance configured at the PIC level is bound to its Packet Forwarding Engines and ports.

To associate a port-mirroring instance with a specific Packet Forwarding Engine, include the **port-mirror-instance *port-mirroring-instance-name*** statement at the **[edit chassis fpc *slot-number* pic *slot-number*]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  port-mirror-instance port-mirroring-instance-name-a;
  pic slot-number {
    port-mirror-instance port-mirroring-instance-name-b;
  }
}
```

The properties of the port-mirroring instance associated with the PIC override the properties of the port-mirroring instance associated with the DPC (configured by including the **port-mirroring *port-mirroring-instance-name*** statement at the **[edit chassis fpc *slot-number*]** hierarchy level).

For more information about configuring port mirroring for Layer 2 VPLS traffic on MX Series routers, see the *Junos MX Series Ethernet Services Routers Layer 2 Configuration Guide*.

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

Symmetrical hashing for load balancing on an 802.3ad Link Aggregation Group (LAG) is useful when two MX Series routers (for example, Router A and Router B) are connected transparently through Deep Packet Inspection (DPI) devices over a LAG bundle. The DPI devices keep track of traffic flows in both the forward and reverse directions.

If symmetrical hashing is configured, the reverse flow of traffic is also directed through the same child link on the LAG and is bound to flow through the same DPI device. This enables proper accounting on the DPI of the traffic in both the forward and reverse flows.

If symmetrical hashing is not configured, a different child link on the LAG might be chosen for the reverse flow of traffic through a different DPI device. This results in incomplete information about the forward and reverse flows of traffic on the DPI device leading to incomplete accounting of the traffic by the DPI device.

Symmetrical hashing is computed based on fields like source address and destination address. You can configure symmetrical hashing both at the chassis level and the PIC level for load balancing based on Layer 2, Layer 3, and Layer 4 data unit fields for family inet (IPv4 protocol family) and multiservice (switch or bridge) traffic. Symmetrical hashing configured at the chassis level is applicable to the entire router, and is inherited by all its PICs and Packet Forwarding Engines. Configuring PIC-level symmetrical hashing provides you more granularity at the Packet Forwarding Engine level.

For the two routers connected through the DPI devices over a LAG bundle, you can configure **symmetric-hash** on one router and **symmetric-hash complement** on the remote-end router or vice-versa.

To configure symmetrical hashing at the chassis level, include the **symmetric-hash** or the **symmetric-hash complement** statements at the **[edit forwarding-options hash-key family]** hierarchy level. For information about configuring symmetrical hashing at the chassis level and configuring the link index, see the *Junos OS Network Interfaces Library for Routing Devices* and the *Junos OS VPNs Library for Routing Devices*.

NOTE: **On MX Series DPCs, configuring symmetrical hashing at the PIC level refers to configuring symmetrical hashing at the Packet Forwarding Engine level.**

To configure symmetrical hashing at the PIC level on the inbound traffic interface (where traffic enters the router), include the **symmetric-hash** or **symmetric-hash complement** statement at the [**edit chassis fpc *slot-number* pic *pic-number* hash-key**] hierarchy level:

```
[edit chassis fpc slot-number pic pic-number hash-key]
family multiservice {
  source-mac;
  destination-mac;
  payload {
    ip {
```

```
            layer-3 (source-ip-only | destination-ip-only);
            layer-4;
        }
    }
    symmetric-hash {
        complement;
    }
}
family inet {
    layer-3;
    layer-4;
    symmetric-hash {
        complement;
    }
}
```

NOTE:

- PIC-level symmetrical hashing overrides the chassis-level symmetrical hashing configured at the [**edit chassis forwarding-options hash-key**] hierarchy level.
- Symmetrical hashing for load balancing on 802.3ad Link Aggregation Groups is currently supported for the VPLS, INET and bridged traffic only.
- Hash key configuration on a PIC or Packet Forwarding Engine can be either in the “symmetric hash” or the “symmetric hash complement” mode, but not both at the same time.

Related Documentation

- Examples: Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs on MX Series Routers on page 421
- family on page 489
- hash-key on page 504
- inet on page 508
- multiservice on page 530
- payload on page 542
- symmetric-hash on page 578

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

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

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

- Contains 16 built-in 10-Gigabit Ethernet ports in groups of four each. It does not contain separate slots for Modular Interface Cards (MICs).
- Supports LAN-PHY mode at 10.3125 Gbps.

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

- Supports small form-factor pluggable transceivers of the SFP+ standard. For a list of supported SFPs, see the *MX Series Interface Module Reference*.
- Supports an effective line rate of twelve 10-Gigabit Ethernet ports. If all sixteen 10-Gigabit Ethernet ports are used, the line card is oversubscribed in the ratio of 4:3.
- Supports intelligent oversubscription services.
- Supports one full-duplex 10-Gigabit Ethernet tunnel interface for each Packet Forwarding Engine. .

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

Related Documentation

- *16x10GE MPC*
- *MX Series Interface Module Reference*.
- Configuring the Number of Active Ports on MX Series Routers on page 239
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 254
- *Configuring Tunnel Interfaces on MX Series Routers*

Configuring the Number of Active Ports on MX Series Routers

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

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

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

SCBs (three SCBs for an MX960 router, two SCBs for an MX480 or MX240 router) actively in the chassis.

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

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

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

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

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

Specify either 8 or 12 ports using this statement. When eight active ports are configured, two ports per Packet Forwarding Engine are disabled, and the LEDs on the MPC are set to **yellow**. When you specify 12 active ports, one port per Packet Forwarding Engine is disabled and the corresponding LED is set to **yellow**. When you do not include this statement in the configuration, all 16 default ports on the MPC are active.

NOTE:

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

For more information about the 16x10GE 3D MPC, see the *MX Series Interface Module Reference*.

Related Documentation

- 16-Port 10-Gigabit Ethernet MPC on MX Series Routers (16x10GE 3D MPC) Overview on page 238
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 254
- *Configuring Tunnel Interfaces on MX Series Routers*
- **number-of-ports on page 535**

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 238
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 254

MPC3E on MX Series Routers Overview

MX960, MX480, MX240, and MX2020 routers support the MPC3E (MX-MPC3E-3D) with two MIC slots. The MPC provides the connection between the customer's Ethernet interfaces and the routing fabric of the MX Series chassis. The MPC is inserted into a MIC slot in an MX Series router. MICs provide the physical interface and are installed into the MPCs.

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

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

The MPC3E also supports these legacy MICs:

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

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

You can also configure the 100-Gigabit Ethernet MIC (MIC3-3D-1X100GE-CFP) to interoperate with routers using the 100-Gigabit Ethernet PIC (Type 4 1X100GE PIC for STFPC4 FPC) by using the **forwarding-mode** statement with the **sa-multicast** option at the **[edit chassis fpc slot pic slot]** hierarchy level. For more information, see "Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs (PD-1CE-CFP-FPC4) (Type 4 1X100GE PIC for STFPC4 FPC) Using SA Multicast Mode" on page 248.

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

The MPC3E supports these key features:

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

  - MIC3-3D-2X40GE-QSFP
  - MIC-3D-20GE-SFP
  - MIC-3D-20GE-SFP-E
  - MIC-3D-2XGE-XFP
  - MIC-3D-8OC3OC12-4OC48
  - MIC-3D-4OC3OC12-1OC48
  - MIC-3D-1OC192-XFP
  - MIC-3D-8DS3-E3
- Up to 100 Gbps per MIC slot
- Up to 200 Gbps aggregate WAN bandwidth connectivity for the two MIC slots; the line card is oversubscribed in the ratio of 1.5:1.
- Up to four full-duplex tunnel interfaces on the line card
- Intelligent oversubscription services
- Configuration of Virtual Chassis ports in an MX Series Virtual Chassis member router

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

For more information about supported Junos OS features on the MPC3E, see *Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC3E* in the *MX Series Interface Module Reference*.

The MPC3E supports feature parity with the following software features:

- Basic Layer 2 features and virtual private LAN service (VPLS) functionality
- Layer 3 routing protocols
- MPLS
- Multicast forwarding
- Firewall filters and policers
- Intelligent hierarchical policers
- Per unit scheduling
- Class-of-service (CoS) support
- Synchronous Ethernet
- Tunnel support
- Interoperability with existing DPCs and MPCs
- Unified in-service software upgrade (ISSU)

For information about the supported and unsupported Junos OS features for this MPC, see *Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC3E* in the *MX Series Interface Module Reference*.

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

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

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

Related Documentation

- *MPC3E MIC Overview*
- *Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC3E*
- Configuring Tunnel Interfaces on MX Series Routers with the MPC3E on page 246
- Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs (PD-1CE-CFP-FPC4) (Type 4 1X100GE PIC for STFPC4 FPC) Using SA Multicast Mode on page 248
- 2-port *10-Gigabit Ethernet MICs with XFP*
- *MX Series Interface Module Reference*.

MPC4E on MX Series Routers Overview

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

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

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

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

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

You can also configure the MPC4E to interoperate with routers that use the 100-Gigabit Ethernet PIC (Type 4 PIC on Type 4 FPC) by using the **forwarding-mode** statement with the **sa-multicast** option at the **[edit chassis fpc *slot* pic *slot*]** hierarchy level. For more information, see "Configuring MPC4E (MPC4E-3D-2CGE-8XGE) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode" on page 251.

MPC4E supports:

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

NOTE: On MX480 routers, only 5 out of the 6 line-card slots can be populated with MPC4Es. On MX960 routers, only 10 out of the 11 line-card slots can be populated with MPC4Es. This is a power restriction. You can insert other line-cards in the remaining slots as long as the power budget is not exceeded. For more information about power requirements, see *Power Requirements for an MX240 Router*, *Power Requirements for an MX480 Router* , and *Power Requirements for an MX960 Router*. Also, on the MX960 router, FPC slot 0 and FPC slot 11 are not NEBS compliant beyond 104ºF (40ºC). This is a cooling restriction.

For more information about the supported and unsupported Junos OS software features for this MPC, see *Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC4Es* in the *MX Series Line Card Guide*.

Related Documentation

- *2x100GE + 8x10GE MPC4E*
- *32x10GE MPC4E*
- *Calculating Power Requirements for MX240 Routers*
- *Calculating Power Requirements for MX480 Routers*
- *Calculating Power Requirements for MX960 Routers*
- *Calculating AC Power Requirements for MX2010 Routers*
- *Calculating DC Power Requirements for MX2010 Routers*
- *Calculating AC Power Requirements for MX2020 Routers*
- *Calculating DC Power Requirements for MX2020 Routers*
- *Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC4Es*

Configuring Tunnel Interfaces on MX Series Routers with the MPC3E

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

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

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

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

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

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

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

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

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

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

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

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

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

Related Documentation

- Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 423
- Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 424
- Example: Configuring Tunnel Interfaces on the MPC3E on page 424
- **bandwidth (Tunnel Services) on page 467**
- **tunnel-services (Chassis) on page 597**
- *[edit chassis] Hierarchy Level*

Configuring Tunnel Interfaces on MX Series Routers with MPC4E

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

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

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

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

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

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

Related Documentation

- bandwidth (Tunnel Services) on page 467
- tunnel-services (Chassis) on page 597
- *[edit chassis] Hierarchy Level*
- *Configuring Tunnel Interfaces on MX Series Routers*

Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs (PD-1CE-CFP-FPC4)Using SA Multicast Mode

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

SA multicast mode uses the multicast bit in the source MAC address for packet steering. By default, the SA multicast bit is set to 0 for all packets sent by the 100-Gigabit Ethernet MIC. The egress packet flow is the traffic flowing from the 100-Gigabit Ethernet MIC to the 100-Gigabit Ethernet PIC. Since no VLAN tags are available, the SA multicast bit is sent on the outgoing packets. At the other end, the 100-Gigabit Ethernet PIC looks at the bit and forwards the packets to either Packet Forwarding Engine 0 or 1. The ingress packet flow is the traffic flowing from a 100-Gigabit Ethernet PIC to a 100-Gigabit Ethernet MIC. When the 100-Gigabit Ethernet PIC is sending out a packet, the multicast bit is set based on the Packet Forwarding Engine packet received. The multicast bit is then transmitted and the MPC3E sees the multicast bit on ingress.

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

Configuring 100-Gigabit Ethernet MICs

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

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

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

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

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

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


Configuring 100-Gigabit Ethernet PIC (PD-1CE-CFP-FPC4)

The default packet steering mode for the 100-Gigabit Ethernet PIC (PD-1CE-CFP-FPC4)is SA multicast bit mode. There is no SA multicast configuration required on the 100-Gigabit Ethernet PIC to enable this mode.

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

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

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

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

Related Documentation

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

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

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

- Configuring SA Multicast Bit Steering Mode on MPC4E on page 251
- Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface on page 252

Configuring SA Multicast Bit Steering Mode on MPC4E

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Verify the configuration at the interface.

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

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

Related Documentation

- *sa-multicast*
- *forwarding-mode*
- Interoperability Between MPC4E (MPC4E-3D-2CGE-8XGE) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 17

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 CLI Explorer.

If the power-on sequence is not configured by including the **fru-poweron-sequence** statement, the Junos OS uses the ascending order of the slot numbers of the DPCs as the sequence to power-on the DPCs.

Related Documentation

- fru-poweron-sequence on page 502

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

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

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

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

Related Documentation

- Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 305

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

The Junos OS enables you to configure session offloading for Multiservices DPCs on MX Series routers. This enables Fast Update Filters (FUF) at the PIC level for a multiservices interface (**ms-*fpc-pic-port***). To configure session offloading, include the **session-offload** statement at the **[edit chassis fpc *slot-number* pic *number* adaptive-services service-package extension-provider]** hierarchy level:

```
[edit chassis fpc slot-number pic number adaptive-services service-package
   extension-provider]
session-offload;
```

Currently, session offloading is supported only for a maximum of one multiservices interface.

NOTE: When session offloading is enabled for a Multiservices PIC, we recommend that you limit dynamic application awareness features for Intrusion Detection and Prevention (IDP) only for that interface.

Related Documentation

- session-offload on page 568

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 167
- *Firewall Filters and Enhanced Network Services Mode Overview*
- Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers on page 170
- 16-Port 10-Gigabit Ethernet MPC on MX Series Routers (16x10GE 3D MPC) Overview on page 238
- network-services on page 532

Accounting of the Layer 2 Overhead Attribute in Interface Statistics

On MX Series and T Series routers, you can configure the logical interface statistics to include the Layer 2 overhead size (header and trailer bytes) for both ingress and egress interfaces. Both the transit and total statistical information are computed and displayed for each logical interface. This functionality is supported on 1-Gigabit, 10-Gigabit, 40-Gigabit, and 100-Gigabit Ethernet interfaces on Dense Port Concentrators (DPCs), Modular Port Concentrators (MPCs), and Type-3, Type-4 and Type-5 Flexible Port Concentrators (FPCs). Also, this feature is supported on 10-Gigabit Ethernet interfaces on MX Series routers with MPC4E. To enable the Layer 2 overhead bytes to be counted in the interface statistics at the PIC level, you must use the **account-layer2-overhead** statement at the **[edit chassis fpc *slot-number* pic *pic-number*]** hierarchy level.

If you configure this capability, all the Layer 2 header details (Layer 2 header and cyclic redundancy check [CRC]) based on the Layer 2 encapsulation configured for an interface are calculated and displayed in the logical interface statistics for ingress and egress interfaces in the output of the **show interfaces *interface-name*** commands. For logical interfaces, the **Input bytes** and **Output bytes** fields under the Traffic statistics section in the output of the **show interfaces *interface-name* <detail | extensive>** command include the Layer 2 overhead of the packets. For logical interfaces, the Input rate and Output rate fields under the Traffic statistics section in the output of the **show interfaces *interface-name* <media | statistics>** command include the Layer 2 overhead of the packets. For logical interfaces, the values for the newly added **Egress account overhead** and **Ingress account overhead** fields display the Layer 2 overhead size for transmitted and received packets respectively.

The input and output octets at the logical interface configured on the PIC includes all the Layer 2 headers. All the logical interfaces on the PIC, including the ae and the non-ae interfaces, are processed for Layer 2 overhead accounting for the arriving and exiting packets. This method of operation impacts the transit statistics that are primarily used for subscriber accounting and billing purposes in customer networks.

Table 20 on page 255 lists the adjustment bytes that are counted based on the encapsulation on the logical interface over the Ethernet interface, when you enable accounting of Layer 2 overhead in interface statistics at the PIC level. The values for the adjustment bytes that are listed for all types of encapsulation are the same for DPCs and MPCs, with the only exception being for the VLAN CCC adjustment value. On DPCs, the VLAN CCC adjustment value is –4 bytes and on MPCs, the VLAN CCC adjustment value is +4 bytes.

Table 20: Adjustment Bytes for Logical Interfaces over Ethernet Interfaces

Encapsulation Type on Logical Interfaces	Number of Adjustment Bytes	Description
Ethernet DIXv2 (IP datagrams over Ethernet)	18	Untagged (includes CRC)
Ethernet DIXv2 (IP datagrams over Ethernet)	22	Single-tagged (includes CRC)

Table 20: Adjustment Bytes for Logical Interfaces over Ethernet Interfaces *(continued)*

Encapsulation Type on Logical Interfaces	Number of Adjustment Bytes	Description
Ethernet DIXv2 (IP datagrams over Ethernet)	26	Double-tagged (includes CRC)
VLAN Bridge	4	CRC
VLAN CCC	4	CRC
VLAN TCC	18	Untagged (includes CRC)
VLAN TCC	22	Single-tagged (includes CRC)
VLAN TCC	26	Double-tagged (includes CRC)
VLAN VPLS	4	CRC

Guidelines for Configuring the Computation of Layer 2 Overhead in Interface Statistics

Keep the following points in mind when you configure the computation of Layer 2 overhead in interface statistics:

- When you configure a native VLAN ID on a logical interface, the Layer 2 header adjustment for input statistics is different for tagged and untagged packets. For such interfaces, if you configure the setting to account for Layer 2 overhead, incorrect statistics might be displayed.
- An untagged packet is considered as a tagged packet and an additional 4 bytes are appended to the counter values displayed in the output of the **show interface** command.
- The computed statistics might not be completely accurate in scenarios where the packets are dropped after they have been included in the interface statistics, but before the packets reach the destination.
- Label-switched interface (LSI) statistics on the ingress direction of interfaces do not include the Layer 2 overhead bytes because this functionality of accounting Layer 2 overhead is not supported for such LSI interfaces.
- Layer 2 overhead accounting is not supported for inline service (si) interfaces.
- The total statistics of interfaces do not indicate the complete Layer 2 adjusted statistics. This behavior occurs because the total statistics count is the sum of transit and local statistics. Only the transit statistics are adjusted for Layer 2 and the local statistics are not adjusted for Layer 2.
- Statistics on ae interfaces are calculated in the same manner as non-ae interfaces.
- Adjustment bytes are applicable only for transit statistics that are displayed for logical interfaces.

- For physical interfaces, the adjustment bytes for transit traffic and the non-adjusted bytes for local or protocol-specific traffic are combined and displayed in the output of the **show interfaces** command. (Segregation is not possible.)
- Layer 2 overhead accounting can be enabled at both PIC level and logical interface level.
- When the **account-layer2-overhead** statement is configured, the Layer 2 overhead size in both input and output statistics is accounted for in Dense Port Concentrator (DPCs) and Modular Port Concentrator (MPCs).
- This **account-layer2-overhead** configuration now supports Layer 2 accounting for the Ethernet bridge encapsulation.
- The Layer 2 overhead bytes in interface statistics are saved across a unified ISSU or a graceful Routing Engine switchover (GRES) operation.

Related Documentation

- Configuring Layer 2 Overhead Accounting in Interface Statistics on page 257
- Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 258
- **account-layer2-overhead on page 460**
- *Ethernet Interfaces Feature Guide for Routing Devices*

Configuring Layer 2 Overhead Accounting in Interface Statistics

This topic contains sections that describe the configuration of Layer 2 overhead accounting for interface statistics at the PIC level and logical interface level.

Layer 2 overhead accounting can be enabled at both PIC level and logical interface level through configuration. By default, the physical interface and logical interface statistics do not account for Layer 2 overhead size (header and trailer) in both input and output statistics.

When the **account-layer2-overhead** statement is configured, the Layer 2 overhead size in both input and output statistics is accounted for in the Dense Port Concentrator (DPCs) and the Modular Port Concentrator (MPCs). This **account-layer2-overhead** configuration now supports Layer 2 accounting for the Ethernet bridge encapsulation.

- Enabling the Accounting of Layer 2 Overhead in Interface Statistics at the PIC Level on page 257

Enabling the Accounting of Layer 2 Overhead in Interface Statistics at the PIC Level

You can configure the **account-layer2-overhead** statement at the **edit chassis fpc *slot-number* pic *pic-number*** hierarchy level to enable accounting of Layer 2 overhead bytes in the ingress and egress interface statistics at the PIC level.

CAUTION: **If you modify the setting for accounting of Layer 2 overhead bytes at the PIC level, the PIC is rebooted, causing all of the physical and logical** interfaces to be deleted and readded on the PIC. Due to this behavior, we recommend that you exercise caution while using this feature.

The computation method of Layer 2 overhead on different interface types is as follows:

- For Ethernet interfaces, all the Layer 2 headers are counted.
- For non-Ethernet interfaces, the Frame Relay, PPP, or Cisco HDLC headers are counted, while the bit or byte stuffing headers are excluded.

To enable accounting of Layer 2 overhead at the PIC level for ingress and egress traffic on interfaces:

1. Access a DPC or an MPC-occupied slot and the PIC where the interface is to be enabled.

   [edit chassis]
   user@host# **edit fpc *slot-number* pic *number***

2. Specify the Layer 2 overhead value in bytes that is the octet adjustment per packet added to the total octet count for ingress and egress traffic on all the interfaces in the PIC.

   [edit chassis fpc *slot-number* pic *number*]
   user@host# **set account-layer2-overhead**

Verifying the Accounting of Layer 2 Overhead in Interface Statistics

Purpose Display information about the Layer 2 overhead bytes that are counted in interface statistics for egress and ingress traffic on Ethernet interfaces.

Action

- To display information about the Layer 2 overhead bytes that are counted in interface statistics:

NOTE: For physical and logical interfaces, the values displayed for the Input rate and Output rate fields under the Traffic statistics section include the Layer 2 overhead of the packets.

user@host> **show interfaces ge-5/2/0 statistics detail**

```
Physical interface: ge-5/2/0, Enabled, Physical link is Up
  Interface index: 146, SNMP ifIndex: 519, Generation: 149
  Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, BPDU Error: None, MAC-REWRITE Error: None,
Loopback: Disabled,
  Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled, Remote fault: Online
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : None
  CoS queues     : 8 supported, 8 maximum usable queues
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:1d:b5:61:d9:74, Hardware address: 00:1d:b5:61:d9:74
  Last flapped   : 2009-11-11 11:24:00 PST (09:23:08 ago)
```

```
  Statistics last cleared: 2009-11-11 17:50:58 PST (02:56:10 ago)
  Traffic statistics:
   Input  bytes  :              271524                    0 bps
   Output bytes  :            37769598                  352 bps
   Input  packets:                3664                    0 pps
   Output packets:              885790                    0 pps
   IPv6 transit statistics:
    Input  bytes  :                  0
    Output bytes  :           16681118
    Input  packets:                  0
    Output packets:             362633
   Multicast statistics:
    IPV4 multicast statistics:
     Input  bytes  :              112048                    0 bps
     Output bytes  :            20779920                    0 bps
     Input  packets:                1801                    0 pps
     Output packets:              519498                    0 pps
    IPV6 multicast statistics:
     Input  bytes  :              156500                    0 bps
     Output bytes  :            16681118                    0 bps
     Input  packets:                1818                    0 pps
     Output packets:              362633                    0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0, L3 incompletes: 0, L2 channel
errors: 0,
    L2 mismatch timeouts: 0, FIFO errors: 0, Resource errors: 0
  Output errors:
    Carrier transitions: 0, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0, FIFO errors: 0, HS link
CRC errors: 0, MTU errors: 0,
    Resource errors: 0
  Egress queues: 8 supported, 4 in use
  Queue counters:       Queued packets  Transmitted packets      Dropped packets
    0 best-effort               882558               882558                    0
    1 expedited-fo                   0                    0                    0
    2 assured-forw                   0                    0                    0
    3 network-cont                3232                 3232                    0
  Active alarms  : None
  Active defects : None

  Logical interface ge-5/2/0.0 (Index 71) (SNMP ifIndex 573) (Generation 135)
    Flags: SNMP-Traps 0x4000 Encapsulation: ENET2
    Egress account overhead: 100
    Ingress account overhead: 90
    Traffic statistics:
     Input  bytes  :              271524
     Output bytes  :            37769598
     Input  packets:                3664
     Output packets:              885790
     IPv6 transit statistics:
      Input  bytes  :                  0
      Output bytes  :           16681118
      Input  packets:                  0
      Output packets:             362633
    Local statistics:
     Input  bytes  :              271524
     Output bytes  :              308560
     Input  packets:                3664
     Output packets:                3659
    Transit statistics:
     Input  bytes  :                   0                    0 bps
     Output bytes  :            37461038                    0 bps
```



```
     Input  packets:                    0                    0 pps
     Output packets:               882131                    0 pps
     IPv6 transit statistics:
      Input  bytes  :                   0
      Output bytes  :            16681118
      Input  packets:                   0
      Output packets:              362633
    Multicast statistics:
     IPV4 multicast statistics:
      Input  bytes  :              112048                    0 bps
      Output bytes  :            20779920                    0 bps
      Input  packets:                1801                    0 pps
      Output packets:              519498                    0 pps
     IPV6 multicast statistics:
      Input  bytes  :              156500                    0 bps
      Output bytes  :            16681118                    0 bps
      Input  packets:                1818                    0 pps
      Output packets:              362633                    0 pps
    Protocol inet, MTU: 1500, Generation: 151, Route table: 0
      Addresses, Flags: Is-Preferred Is-Primary
        Destination: 40.40.40.0/30, Local: 40.40.40.2, Broadcast: 40.40.40.3, Generation: 167
    Protocol inet6, MTU: 1500, Generation: 152, Route table: 0
      Addresses, Flags: Is-Preferred Is-Primary
        Destination: ::40.40.40.0/126, Local: ::40.40.40.2
    Generation: 169
      Addresses, Flags: Is-Preferred
        Destination: fe80::/64, Local: fe80::21d:b5ff:fe61:d974
    Protocol multiservice, MTU: Unlimited, Generation: 171
    Generation: 153, Route table: 0
      Policer: Input: __default_arp_policer__
```

Related Documentation

- Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 255
- Configuring Layer 2 Overhead Accounting in Interface Statistics on page 257
- *show interfaces (Gigabit Ethernet)*
- *show interfaces statistics*
- *Ethernet Interfaces Feature Guide for Routing Devices*

Upgrading non-HQoS MPCs to Support Flexible Queuing

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

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

To configure flexible queuing on non-HQoS MPCs:

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

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

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

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

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

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

Related Documentation

- Disabling Flexible Queuing for non-HQoS MPCs to Optimize Power Utilization on page 261
- Flexible Queuing Mode Overview on page 25
- **flexible-queuing-mode on page 494**

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

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

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

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

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

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

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

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

[edit]
user@router#
```

Related Documentation

- Flexible Queuing Mode Overview on page 25
- Upgrading non-HQoS MPCs to Support Flexible Queuing on page 260

CHAPTER 9

Configuring T Series Chassis-Level Features

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

Starting with Junos OS Release 12.3, you can configure the power-on sequence for the Flexible PIC Concentrators (FPCs) on T640, T1600, and T4000 routers. This configuration enables you to redistribute the available power to the FPCs on the basis of your requirements and the calculated power consumption of the FPCs.

To configure the power-on sequence:

1. At the **[edit chassis]** hierarchy level, configure the **fru-poweron-sequence** statement indicating the order in which the FPCs need to be powered on.

   [edit chassis]
   user@host# **set fru-poweron-sequence** ***fru-poweron-sequence***

   For example:

   [edit chassis]
   user@host# **set fru-poweron-sequence “0 2 1”**

2. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
fru-poweron-sequence "0 2 1";
```

NOTE:

- If the configured sequence contains invalid numbers, Junos OS considers only the valid numbers in the sequence. The invalid numbers are silently discarded.
- If the power-on sequence is not configured by including the **fru-poweron-sequence** statement, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power on the FPCs.

Related Documentation

- Configuring the Six-Input DC Power Supply on page 375
- **fru-poweron-sequence on page 502**

Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis

You can configure the operations support systems (OSS) mapping feature to represent a T4000 chassis as a T1600 chassis or a T640 chassis. This topic includes the following tasks:

- Configuring T4000 Chassis as a T1600 Chassis on page 264
- Configuring T4000 Chassis as a T640 Chassis on page 264
- Disabling the OSS Mapping Feature on page 265

Configuring T4000 Chassis as a T1600 Chassis

To configure a T4000 chassis as a T1600 chassis:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]
user@T4000# edit chassis
```

2. Configure the OSS mapping feature to map the T4000 chassis to a T1600 chassis.

```
[edit chassis]
user@T4000# set oss-map model-name t1600
```

Configuring T4000 Chassis as a T640 Chassis

To configure a T4000 chassis as a T640 chassis:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]
user@T4000# edit chassis
```

2. Configure the OSS mapping feature to map the T4000 chassis to a T640 chassis.

```
[edit chassis]
user@T4000# set oss-map model-name t640
```


NOTE: By default, the OSS mapping feature is disabled.

Disabling the OSS Mapping Feature

To disable the OSS mapping feature:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

   [edit]
   user@T4000# **edit chassis**

2. Disable the OSS mapping feature that maps a T4000 chassis to a T640 chassis.

   [edit chassis]
   user@T4000# **delete oss-map model-name t640**

3. Disable the OSS mapping feature that maps a T4000 chassis to a T1600 chassis.

   [edit chassis]
   user@T4000# **delete oss-map model-name t1600**

NOTE:

- The **set chassis oss-map model-name t640 | t1600** command is applicable only on T4000 routers. You must explicitly set this command when a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis.
- You can execute the **set chassis oss-map model-name t640** command or the **set chassis oss-map model-name t1600** command if the OSS is compatible with either the T640 chassis or the T1600 chassis, respectively.

Configuring Voltage Level Monitoring of FPCs on T Series Routers

You can monitor the voltage on the flexible PIC concentrator (FPC) on T series routers at regular intervals. When the voltage falls below 10%, the FPC is offlined.

The faulty FPC is monitored at 500ms intervals. The output of the **show chassis fpc** command shows **Power Failure** for the faulty FPC. The FPC remains in powered down state until the voltage level is normal again.

- Enabling Voltage Failure Errors on the FPC on page 265
- Disabling Voltage Failure Errors on the FPC on page 266

Enabling Voltage Failure Errors on the FPC

fpc-nmi-volt-fail-knob controls the behavior of the FPC after detecting voltage failure, and to online or offline the FPC based on the voltage level. To enable monitoring the voltage level on the FPC:

1. Navigate to the **[edit chassis]** hierarchy level.

2. Include the **set chassis fpc-nmi-volt-fail-knob enable** statement to enable voltage monitoring on the FPC.

```
[edit chassis]
  {
    fpc-nmi-volt-fail-knob enable;
  }
```

Disabling Voltage Failure Errors on the FPC

To disable monitoring the voltage level on the FPC:

1. Navigate to the **[edit chassis]** hierarchy level.
2. Include the **set chassis fpc-nmi-volt-fail-knob disable** statement to disable voltage monitoring on the FPC.

```
[edit chassis]
  {
    fpc-nmi-volt-fail-knob disable;
  }
```

Related Documentation

- show chassis fpc on page 1212
- fpc-nmi-volt-fail-knob on page 499

CHAPTER 10

Configuring PTX Series Chassis-Level Features

Configuring the Power-On Sequence for FPCs on PTX Series Packet Transport Routers

By default, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power on the FPCs. To configure the power-on sequence, include the **fru-poweron-sequence** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
fru-poweron-sequence;
```

Issue the **show chassis power** command to view power limits and usage details for the FPCs. Issue the **show chassis power sequence** command to view details about the power-on sequence for the FPCs. .

If the power-on sequence is not configured by including the **fru-poweron-sequence** statement, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power-on the FPCs.

Related Documentation

- fru-poweron-sequence on page 502

Configuring FPC Error Levels and Actions on PTX Series Routers

Starting with Junos OS Release 13.3, you can use PTX Series routers to configure Packet Forwarding Engine (PFE)-related error levels on FPCs and the actions to perform when a specified threshold is reached. In Junos OS Release 13.2 and earlier, Packet Forwarding Engine errors would disable the FPC. Using the **error** command, Packet Forwarding Engine errors can be isolated, which reduces the need for a field replacement. This command is available at the **[edit chassis fpc slot-number]** and **[edit chassis]** hierarchies.

To configure Packet Forwarding Engine error levels and actions on PTX Series routers:

- (Optional) Configure the fatal error level threshold and action:

```
[edit chassis fpc error]
user@host# set fatal action action
user@host# set fatal threshold threshold-level
```

- (Optional) Configure the major error level threshold and action:

```
[edit chassis fpc error]
user@host# set major action action
user@host# set major threshold threshold-level
```

- (Optional) Configure the minor error level threshold and action:

```
[edit chassis fpc error]
user@host# set minor action action
user@host# set minor threshold threshold-level
```

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- error on page 486
- action on page 460
- threshold on page 592

CHAPTER 11

Configuring PIC-Specific Features

Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline

By default, a Flexible PIC Concentrator (FPC) is configured to restart after a system reboot. To configure an FPC to stay offline and prevent it from restarting, include the **power off** statement at the **[edit chassis fpc *slot-number*]** hierarchy level:

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

```
power off;
```

NOTE: You can use the **request chassis fpc** operational mode command to take an FPC offline, but the FPC attempts to restart when you enter a **commit** CLI command.

To bring an FPC online that is configured to stay offline and configure it to stay online, include the **power on** statement at the **[edit chassis fpc *slot-number*]** hierarchy level:

```
[edit chassis fpc slot-number]
power on;
```

Related Documentation

- Configuring the Junos OS to Make an SFM Stay Offline on page 230
- Router Chassis Configuration Statements on page 454

Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs

In Junos OS Release 8.4 and later, the family of next-generation SONET Phase I PICs includes Type 1 and Type 2 PICs. Each PIC type has three varieties.

Type1 PICs include:

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

Type 2 PICs include:

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

The PICs are supported on Type 1 and Type 2 FPC interfaces. Hot-pluggable SFPs are used as optical transponders. The PICs provide unprecedented flexibility by allowing the user to configure a variety of modes on them through the configuration of concatenation/nonconcatenation and speed.

The 4-port OC48 PIC with SFP installed, the next-generation SONET/SDH PICs with SFP, and the 4-port OC192 PIC on M Series and T Series routers, support SONET or SDH framing on a per-port basis. This functionality allows you to mix SONET and SDH modes on interfaces on a single PIC.

Port level framing is supported for only the PICs listed below in Table 1. This is expected behavior.

Table 21: PICs supporting port level framing

I2C-ID Name	Model Number	PIC Type
1xCOC12 Q2 PIC	1x CHOC12 IQE SONET	Type 1
4xCOC12 Q2 PIC	4x CHOC12 IQE SONET	Type 2
4xCOC12 Q2 TYPE3 PIC	4x CHOC12 (TYPE3) IQE SONET	Type 3
1x COC48 Q2 PIC	1x CHOC48 IQE SONET	Type 2
1x OC12 Q2 PIC	1x OC12 IQE SONET	Type 1
2xCOC3 Q2 PIC	2x CHOC-3 IQE SONET	Type 1
4xOC3 Q2 PIC	4x OC-3 IQE SONET	Type 1
8OC3OC12 4OC48 MIC	MIC-3D-8OC3OC12-4OC48	–
4OC3OC12 1OC48 MIC	MIC-3D-4OC3OC12-1OC48	–

Table 21: PICs supporting port level framing *(continued)*

I2C-ID Name	Model Number	PIC Type
8CHOC3 4CHOC12 MIC	MIC-3D-8CHOC3-4CHOC12	–
4CHOC3 2CHOC12 MIC	MIC-3D-4CHOC3-2CHOC12	–
1CHOC48 MIC	MIC-3D-1CHOC48 SFP	–
1OC192 HO VCAT MIC	MIC-3D-1OC192-XFP	–
IQECC 4XOC48 TYPE3 PIC	4x OC-48 IQE SONET	Type 3
CE 4xCOC3 SFP PIC	4x CHOC3 SONET CE SFP	–
2XOC12 8XOC3 ATM SFP MIC	2xOC12/8xOC3 CC-CE	–

For information about configuring port speed for concatenate mode on a next-generation PIC, see the *Junos OS Hardware Network Operations Guide*.

By default, SONET/SDH PICs use SONET framing. For a discussion of the differences between the two standards, see the *SONET/SDH Interfaces Feature Guide for Routing Devices*.

To configure a PIC to use SDH framing, include the **framing** statement at the **[edit chassis fpc *slot-number* pic *pic-number*]** hierarchy level, specifying the **sdh** option:

```
[edit chassis]
user@host# set fpc  slot-number pic  pic-number framing sdh
[edit chassis]
user@host# show
fpc slot-number {
   pic pic-number {
      framing sdh;
   }
}
```

On a TX Matrix or TX Matrix Plus router, include the **framing** statement at the **[edit chassis lcc *number* fpc *slot-number* pic *pic-number*]** hierarchy level, specifying the **sdh** option:

```
[edit chassis lcc number]
user@host# set fpc slot-number pic pic-number framing sdh
[edit chassis lcc number]
user@host# show
fpc slot-number {
   pic pic-number {
      framing sdh;
   }
}
```

To explicitly configure a PIC to use SONET framing, include the **framing** statement at the **[edit chassis fpc *slot-number* pic *pic-number*]** hierarchy level, specifying the **sonet** option:

```
[edit chassis]
user@host# set fpc slot-number pic pic-number framing sonet
[edit chassis]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sonet;
  }
}
```

On a TX Matrix or TX Matrix Plus router, include the **framing** statement at the **[edit chassis lcc *number* fpc *slot-number* pic *pic-number*]** hierarchy level, specifying the **sonet** option:

```
user@host# set fpc slot-number pic pic-number framing sonet
[edit chassis lcc number]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sonet;
  }
}
```

Related Documentation

- TX Matrix Router and T640 Router Configuration Overview on page 173
- TX Matrix Plus Router Configuration Overview on page 178
- Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 277

Configuring Junos OS to Enable SONET/SDH Framing for ATM MICs

In Junos OS Release 12.1 and later, the ATM MIC enables support for ATM pseudowire on MX Series routers. ATM MICs are rate-selectable at the following rates: 2-port OC12 or 8-port OC3. The MICs are supported on MPC interfaces. Hot-pluggable SFPs are used as optical transponders. The MICs allow the user to configure both the mode and the speed. The ATM MIC (2-port OC12 and the 8-port OC3) with SFP installed support SONET or SDH framing on a per-port or per-PIC basis. To enable the entire MIC to function in either SONET or SDH mode, you can configure framing at the MIC level. To enable the framing on a port-by-port basis, you can configure framing at the port level.

NOTE: **This topic uses the term PIC for ATM MICs and the term FPC for MPC where the reference is to a CLI or Junos OS entity.**

By default, ATM MICs use SONET framing. For a discussion of the differences between the two standards, see the *SONET/SDH Interfaces Feature Guide for Routing Devices*.

To configure the MIC to use SDH framing on a per-PIC basis:

1. At the **[edit chassis]** hierarchy level in configuration mode, specify the PIC and the framing mode to be configured.

   ```
   [edit chassis]
   ```

user@host# **set fpc** *fpc-slot* **pic** *pic-number* **framing sdh**;

For example:

[edit chassis]
user@host# **set fpc 2 pic 0 framing sdh**;

2. Verify the configuration.

```
[edit chassis]
user@host# show
fpc 2 {
    pic 0 {
        framing sdh;
           }
       }
```

To configure the MIC to use SDH framing on a per-port basis:

1. At the **[edit chassis]** hierarchy level in configuration mode, specify the PIC, port number, and the framing mode to be configured.

   [edit chassis]
   user@host# **set fpc** *fpc-slot* **pic** *pic-number* **port** *port-number* **framing sdh**;

   For example:

   [edit chassis]
   user@host# **set fpc 2 pic 0 port 0 framing sdh**;

2. Verify the configuration.

```
[edit chassis]
user@host# show
fpc 2 {
    pic 0 {

port 0 {
        framing sdh;
           }
       }
}
```

Related Documentation

- Configuring a Port Speed on page 286

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 345
- Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 280
- Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 346
- **atm-cell-relay-accumulation on page 465**

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 277
- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 299
- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 278
- Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 301
- Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 282

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 271
- Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 276

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 22 on page 279 for more information about ranges.)

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

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

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

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

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

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

The theoretical maximum number of channel groups possible per PIC is 10 x 24 = 240. This is within the maximum bandwidth available.

There are 32 time slots on an E1 interface. You can designate any combination of time slots for usage.

To use time slots 1 through 10, designate ***slot-number*** as in this example:

```
[edit chassis fpc 1 pic 2 ce1 e1 6]
channel-group 3 timeslots 1-10;
```

To use time slots 1 through 5, time slot 10, and time slot 24, designate ***slot-number*** as in this example:

```
[edit chassis fpc 3 pic 0 ce1 e1 2]
channel-group 1 timeslots 1-5,10,24;
```

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

Related Documentation

- Ranges for Channelized E1 Interfaces Configuration on page 279

Ranges for Channelized E1 Interfaces Configuration

Table 22 on page 279 shows the ranges for configuring channel groups and time slots for Channelized E1 Interfaces.

Table 22: 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

Table 22: Ranges for Channelized E1 Configuration *(continued)*

Item	Variable	Range
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 the TX Matrix Plus routers with 3D SIBs, the range is from 0 through 63. For M40, M40e, M160, M320, M120, and other T Series routers, the range is from 0 through 7. For M20 routers, the range is from 0 through 3. For M10 and M10i routers, the range is from 0 through 1. For M5 and M7i routers, the only applicable value is 0.

Related Documentation

- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 278

Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC

Integrated Local Management Interface (ILMI) is supported on AAL5 interfaces, regardless of transport mode. To enable ILMI on interfaces with cell-relay encapsulation, you must configure an ATM2 IQ PIC to use Layer 2 circuit trunk transport mode.

To configure ILMI on an interface with cell-relay encapsulation, include the following statements:

```
[edit chassis fpc slot-number pic pic-number]
atm-l2circuit-mode trunk trunk;
[edit interfaces at-fpc/pic/port]
encapsulation atm-ccc-cell-relay;
atm-options {
  ilmi;
  pic-type atm2;
}
unit logical-unit-number {
  trunk-id number;
}
```

Related Documentation

- Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 345

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 281

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 280

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 23 on page 282.)

Related Documentation

- Maximum Delay Buffer with q-pic-large-buffer Statement Enabled on page 282

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

Table 23 on page 282 lists the maximum delay buffer that can be configured for T1, E1, and DS0 interfaces configured on Channelized IQ PICs:

Table 23: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled

Platform, PIC, or Interface Type	Maximum Buffer Size
With Large Buffer Sizes Not Enabled	
T Series and M320 routers	50,000 microseconds

Table 23: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled *(continued)*

Platform, PIC, or Interface Type	Maximum Buffer Size
Other M Series routers	200,000 microseconds
IQ PICs on all routers	100,000 microseconds
Channelized T1/E1 interface on J Series Services Routers	400,000 microseconds
With Large Buffer Sizes Enabled	
Channelized T3 and channelized OC3 DLCIs—Maximum sizes vary by shaping rate:	
With shaping rate from 64,000 through 255,999 bps	4,000,000 microseconds
With shaping rate from 256,000 through 511,999 bps	2,000,000 microseconds
With shaping rate from 512,000 through 1,023,999 bps	1,000,000 microseconds
With shaping rate from 1,024,000 through 2,048,000 bps	500,000 microseconds
With shaping rate from 2,048,001 bps through 10 Mbps	400,000 microseconds
With shaping rate from 10,000,001 bps through 20 Mbps	300,000 microseconds
With shaping rate from 20,000,001 bps through 30 Mbps	200,000 microseconds
With shaping rate from 30,000,001 bps through 40 Mbps	150,000 microseconds
With shaping rate up to 40,000,001 bps or higher	100,000 microseconds
*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

Table 23: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled *(continued)*

Platform, PIC, or Interface Type	Maximum Buffer Size
Other IQ interfaces	500,000 microseconds

Related Documentation

- Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 282

Configuring a Policer Overhead

Configuring a policer overhead allows you to control the rate of traffic sent or received on an interface. When you configure a policer overhead, the configured policer overhead value (bytes) is added to the length of the final Ethernet frame. This calculated length of frame is used to determine the policer or the rate limit action. Therefore, the policer overhead enables you to control the rate of traffic sent or received on an interface. You can configure the policer overhead to rate-limit queues and Layer 2 and MAC policers. The policer overhead and the shaping overhead can be configured simultaneously on an interface.

This feature is supported on M Series and T Series routers with IQ2 PICs or IQ2E PICs, and on MX Series DPCs.

To configure a policer overhead for controlling the rate of traffic sent or received on an interface:

1. In the **[edit chassis]** hierarchy level in configuration mode, create the interface on which to add the policer overhead to input or output traffic.

   [edit chassis]
   user@host# **edit fpc** ***fpc*** **pic** ***pic***

   For example:

   [edit chassis]
   user@host# **edit fpc 0 pic 1**

2. Configure the policer overhead to control the input or output traffic on the interface. You could use either statement or both the statements for this configuration.

   [edit chassis fpc *fpc* pic *pic*]
   user@host# **set ingress-policer-overhead** ***bytes*****;**
   user@host# **set egress-policer-overhead** ***bytes*****;**

   For example:

   [edit chassis fpc 0 pic 1]
   user@host# **set ingress-policer-overhead** 10;
   user@host# **set egress-policer-overhead** 20;

3. Verify the configuration:

```
[edit chassis]
```



```
user@host# show
fpc 0 {
    pic 1 {
        ingress-policer-overhead 10;
        egress-policer-overhead 20;
    }
}
```

NOTE: When the configuration for the policer overhead bytes on a PIC is changed, the PIC goes offline and then comes back online. In addition, the configuration in the CLI is on a per-PIC basis and, therefore, applies to all the ports on the PIC.

Related Documentation

- egress-policer-overhead on page 484
- ingress-policer-overhead on page 509

Configuring Mixed-Rate Mode Operation

To configure mixed-rate mode operation in a the PF-24XGE-SFPP PIC:

1. Navigate to the **[edit chassis]** hierarchy level.
2. On a T4000 router, configure the mixed-rate mode by including the **mixed-rate-mode** statement at the **[edit chassis fpc *slot-number* pic *pic-number*]** hierarchy level.

   [edit chassis]
   user@host# **set fpc *fpc-slot* pic pic-number mixed-rate-mode**

   On an LCC in a routing matrix, configure the mixed-rate mode by including the **mixed-rate-mode** statement at the **[edit chassis lcc *lcc number* fpc *slot-number* pic *pic-number*]** hierarchy level.

   [edit chassis]
   user@host# **set lcc *lcc number* fpc *fpc-slot* pic pic-number mixed-rate-mode**
3. Specify the port and the port speed that need to be configured. You can use one of the following speed attributes for this configuration.

   [edit chassis]
   user@host# **set fpc *fpc-slot* pic *pic-number* port port-number speed 1G;**
   user@host# **set fpc *fpc-slot* pic *pic-number* port port-number speed 10G;**
   user@host# **set lcc *lcc number* fpc *fpc-slot* pic pic-number speed 1G;**
   user@host# **set lcc *lcc number* fpc *fpc-slot* pic pic-number speed 10G;**

   NOTE: On a 12 port 10-Gigabit Ethernet PIC (PF-12XGE-SFPP), you can configure the port speed as 1G by including the **set fpc *fpc-slot* pic *pic-number* port port-number speed 1G** statement at the **[edit chassis]** hierarchy level.

NOTE: To change the port speed from 10 Gbps to 1 Gbps on PF-24XGE-SFPP and PF-12XGE-SFPP PICs, SFP optics is required.

To disable mixed-rate mode operation, include the **delete chassis fpc *x* pic *y* mixed-rate-mode** statement at the **[edit chassis]** hierarchy level.

Related Documentation

- *Modes of Operation of 10-Gigabit Ethernet PICs*
- mixed-rate-mode on page 529

Configuring a Port Speed

Configuring a port speed allows you to enable rate-selectability on a per-port basis. When you configure a speed on a per-port basis, you can use the same MIC hardware as you upgrade your network from OC3 to OC12 or OC48 speeds.

This feature is supported on MX Series routers with SONET/SDH OC3/STM1 (Multi-Rate) MICs (MIC-3D-8OC3OC12-4OC48-SFP and MIC-3D-4OC3OC12-1OC48-SFP), Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP (MIC-3D-8CHOC3-4CHOC12 and MIC-3D-4CHOC3-2CHOC12), and ATM MICs with SFP (MIC-3D-8OC3-2OC12-ATM).

To configure a port speed on the chassis for enabling rate-selectability on a per-port basis:

1. At the **[edit chassis]** hierarchy level in configuration mode, specify the port and the port speed that need to be configured. You can use one of the following speed attributes for this configuration.

   [edit chassis]
   user@host# **set fpc *fpc-slot* pic *pic-number* port *port-number* speed oc12-stm4 ;**
   user@host# **set fpc *fpc-slot* pic *pic-number* port *port-number* speed oc3-stm1 ;**
   user@host# **set fpc *fpc-slot* pic *pic-number* port *port-number* speed oc48-stm16 ;**

   NOTE: You can configure the **oc12-stm4**, **oc3-stm1**, and **oc48-stm16** port speed options for SONET/SDH OC3/STM1 (Multi-Rate) MICs. However, for Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP and ATM MICs, you can configure only the **oc12-stm4** and **oc3-stm1** port speed options.

   Also, for ATM MICs, you can configure the **oc12-stm4** port speed option only for ports 0 and 4. If you configure the **oc12-stm4** port speed option for port 0, then ports 1,2, and 3 are disabled. Similarly, if you configure the **oc12-stm4** port speed for port 4, then ports 5,6, and 7 are disabled.

   For example:

   [edit chassis]
   user@host# **set fpc 3 pic 0 port 0 speed oc12-stm4**

2. Verify the configuration:

```
[edit chassis]
user@host# show
fpc 3 {
    pic 0 {
        port 0 {
              speed oc12-stm4;
            }
        }
}
```

By default, rate-selectability is enabled on MX Series routers with SONET/SDH OC3/STM1 (Multi-Rate) MICs, Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, and ATM MICs. However, rate-selectability can be disabled only on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC.

To disable rate-selectability on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC:

1. At the **[edit chassis]** hierarchy level in configuration mode, disable rate-selectability by using the **no-multi-rate** statement.

   [edit chassis]
   user@host# **set fpc *fpc-slot* pic *pic-number* no-multi-rate**

   For example:

   [edit chassis]
   user@host# **set fpc 3 pic 0 no-multi-rate**

2. Verify the configuration:

```
[edit chassis]
user@host# show
fpc 3 {
    pic 0 {
         no-multi-rate;
           }
        }
```

NOTE: You can disable rate-selectability by using the **no-multi-rate** statement only on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP. The **no-multi-rate** statement has no effect on the 4-port SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP, the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, or the ATM MIC.

Related Documentation

- speed on page 576
- no-multi-rate on page 533

CHAPTER 12

Configuring Resynchronization of FPC Sequence Numbers when a new FPC is Brought Online

Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online

On M320, T320, T640, T1600, T4000, TX Matrix, and TX Matrix Plus routers, when you bring a Flexible PIC Concentrator (FPC) online, the sequence number on the FPC may not be synchronized with the other active FPCs in the router, which may result in the loss of a small amount of initial traffic.

To avoid any traffic loss, include the **fpc-resync** statement at the **[edit chassis]** hierarchy level. This ensures that the sequence numbers of the FPC that is brought online is resynchronized with the other active FPCs in the router.

```
[edit chassis]
fpc-resync;
```

NOTE: In order to prevent traffic blackholing, the **fpc-resync** command will have no effect if a single LMNR based FPC and one or more I-chip FPCs exist in the same chassis.

Related Documentation

- fpc-resync on page 500

CHAPTER 13

Configuring Chassis Settings to Support Aggregated Devices

Configuring Junos OS for Supporting Aggregated Devices

Junos OS supports the aggregation of physical devices into defined virtual links, such as the link aggregation of Ethernet interfaces defined by the IEEE 802.3ad standard.

Tasks for configuring aggregated devices are:

Configuring Virtual Links for Aggregated Devices

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

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

For M Series and T Series routers you can configure a maximum of 128 aggregated interfaces (LAG bundles). On MX Series routers running Junos release 14.2R2 and earlier, you can configure a maximum of 480 aggregated interfaces. For MX Series routers running Junos release 14.2R3 and later you can configure a maximum of 1000 aggregated interfaces. For MX2010 and MX2020 routers you can configure a maximum of 800 aggregated interfaces. In all cases the aggregated interfaces are numbered from **ae0** through **ae4091**.

For SONET/SDH, starting with Junos OS Release 13.2, the maximum number of logical interfaces is 64, numbered from **as0** through **as63**. In releases before Junos OS Release 13.2, the maximum was 16.

Configuring LACP Link Protection at the Chassis Level

Link Aggregation Control Protocol (LACP) is one method of bundling several physical interfaces to form one logical interface. You can configure both VLAN-tagged and untagged aggregated Ethernet with or without LACP enabled. LACP exchanges are made between actors and partners. An actor is the local interface in an LACP exchange. A partner is the remote interface in an LACP exchange.

LACP link protection enables you to force active and standby links within an aggregated Ethernet. You configure LACP link protection by using the **link-protection** and **system-priority** statements at either the chassis or interface level and by configuring port priority at the interface level using the **system-priority** statement. Configuring LACP parameters at the chassis level results in all aggregated Ethernet interfaces using the defined values unless overridden by the LACP configuration on a specific interface.

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

NOTE: LACP link protection also uses port priority. You can configure port priority at the Ethernet interface **[gigether-options]** hierarchy level using the **port-priority** statement. If you choose not to configure port priority, LACP link protection uses the default value for port priority (127).

Enabling LACP Link Protection

To enable LACP link protection for aggregated Ethernet interfaces on the chassis, use the **link-protection** statement at the **[edit chassis aggregated-devices ethernet lacp]** hierarchy level:

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


By default, LACP link protection reverts to a higher-priority (lower-numbered) link when that higher-priority link becomes operational or a link is added to the aggregator that is determined to be higher in priority. However, you can suppress link calculation by adding the **non-revertive** statement to the LACP link protection configuration. In nonrevertive mode, after a link is active and collecting and distributing packets, the subsequent addition of a higher-priority (better) link does not result in a switch, and the current link remains active.

CAUTION: **If both ends of an aggregator have LACP link protection enabled, make sure to configure both ends of the aggregator to use the same mode. Mismatching LACP link protection modes can result in lost traffic.**

Configuring System Priority

To configure LACP system priority for aggregated Ethernet interfaces on the chassis, use the **system-priority** statement at the **[edit chassis aggregated-devices ethernet lacp]** hierarchy level:

```
[edit chassis aggregated-devices ethernet lacp]
system-priority priority;
```

The system priority is a 2-octet binary value that is part of the LACP system ID. The LACP system ID consists of the system priority as the two most-significant octets and the interface MAC address as the six least-significant octets. The system with the numerically lower value for system priority has the higher priority. By default, system priority is 127, with a range of 0 through 65,535.

Configuring the Maximum Links Limit

To configure the maximum links limit, use the **maximum-links** statement at the **[edit chassis aggregated-devices]** hierarchy level:

```
[edit chassis aggregated-devices]
maximum-links maximum-links-limit;
```

Related Documentation

- *Configuring an Aggregated Ethernet Interface*
- *Ethernet Interfaces Feature Guide for Routing Devices*
- *Configuring Aggregated Ethernet Interfaces on PTX Series Packet Transport Routers*
- *Configuring Aggregated SONET/SDH Interfaces*

CHAPTER 14

Configuring Chassis Settings to Support Load Balancing

Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing

The Junos OS supports configurations of 16, 32, or 64 equal-cost multipath (ECMP) next hops for RSVP and LDP LSPs on M10i routers with an Enhanced CFEB, M320, M120, MX Series, and T Series routers, and routing devices. For networks with high-volume traffic, this provides more flexibility to load-balance the traffic over as many as 64 LSPs.

To configure the maximum limit for ECMP next hops, include the **maximum-ecmp *next-hops*** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
maximum-ecmp next-hops;
```

You can configure a maximum ECMP next-hop limit of 16, 32, or 64 using this statement. The default limit is 16.

NOTE: MX Series routers with one or more Modular Port Concentrator (MPC) cards and with Junos OS 11.4 or earlier installed, support the configuration of the **maximum-ecmp** statement with only 16 next hops. You should *not* configure the **maximum-ecmp** statement with 32 or 64 next hops. When you commit the configuration with 32 or 64 next hops, the following warning message appears:

Error: Number of members in Unilist NH exceeds the maximum supported 16 on Trio.

The following types of routes support the ECMP maximum next-hop configuration for as many as 64 ECMP gateways:

- Static IPv4 and IPv6 routes with direct and indirect next-hop ECMPs
- LDP ingress and transit routes learned through associated IGP routes
- RSVP ECMP next hops created for LSPs

- OSPF IPv4 and IPv6 route ECMPs
- ISIS IPv4 and IPv6 route ECMPs
- EBGP IPv4 and IPv6 route ECMPs
- IBGP (resolving over IGP routes) IPv4 and IPv6 route ECMPs

The enhanced ECMP limit of up to 64 ECMP next hops is also applicable for Layer 3 VPNs, Layer 2 VPNs, Layer 2 circuits, and VPLS services that resolve over an MPLS route, because the available ECMP paths in the MPLS route can also be used by such traffic.

NOTE:
The following FPCs on M320, T640, and T1600 routers only support 16 ECMP next hops:

- (M320, T640, and T1600 routers only) Enhanced II FPC1
- (M320, T640, and T1600 routers only) Enhanced II FPC2
- (M320 and T640 routers only) Enhanced II FPC3
- (T640 and T1600 routers only) FPC2
- (T640 and T1600 routers only) FPC3

If a maximum ECMP next-hop limit of 32 or 64 is configured on an M320, T640, or T1600 router with any of these FPCs installed, the Packet Forwarding Engines on these FPCs use only the first 16 ECMP next hops. For Packet Forwarding Engines on FPCs that support only 16 ECMP next hops, the Junos OS generates a system log message if a maximum ECMP next-hop limit of 32 or 64 is configured. However, for Packet Forwarding Engines on other FPCs installed on the router, a maximum configured ECMP limit of 32 or 64 ECMP next hops is applicable.

NOTE: If RSVP LSPs are configured with bandwidth allocation, for ECMP next hops with more than 16 LSPs, traffic is not distributed optimally based on bandwidths configured. Some LSPs with smaller allocated bandwidths receive more traffic than the ones configured with higher bandwidths. Traffic distribution does not strictly comply with the configured bandwidth allocation. This caveat is applicable to the following routers:

- T1600 and T640 routers with Enhanced Scaling FPC1, Enhanced Scaling FPC2, Enhanced Scaling FPC3, Enhanced Scaling FPC 4, and all Type 4 FPCs
- M320 routers with Enhanced III FPC1, Enhanced III FPC2, and Enhanced III FPC3
- MX Series routers with all types of FPCs and DPCs, excluding MPCs. This caveat is **not** applicable to MX Series routers with line cards based on the Junos Trio chipset.
- M120 routers with Type 1, Type 2, and Type 3 FPCs
- M10i routers with Enhanced CFEB

Next-hop cloning and permutations are disabled on T Series routers with Enhanced Scaling FPCs (Enhanced Scaling FPC1, Enhanced Scaling FPC2, Enhanced Scaling FPC3, and Enhanced Scaling FPC 4) that support enhanced load-balancing capability. As a result, memory utilization is reduced for a highly scaled system with a high number of next hops on ECMP or aggregated interfaces. Next-hop cloning and permutations are also disabled on T Series routers with Type-4 FPCs.

To view the details of the ECMP next hops, issue the **show route** command. The **show route summary command** also shows the current configuration for the maximum ECMP limit. To view details of the ECMP LDP paths, issue the **traceroute mpls ldp** command.

Related Documentation

- maximum-ecmp on page 521

CHAPTER 15

Configuring Chassis Settings to Support Channelized Interfaces

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

You can configure 28 T1 channels per T3 interface. Each T1 link can have up to eight channel groups, and each channel group can hold any combination of DS0 time slots. To specify the T1 link and DS0 channel group number in the name, use colons (:) as separators. For example, a Channelized DS3-to-DS0 PIC might have the following physical and virtual interfaces:

ds-0/0/0:*x*:*y*

where ***x*** is a T1 link ranging from 0 through 27 and ***y*** is a DS0 channel group ranging from 0 through 7. (See Table 24 on page 300 for more information about ranges.)

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

- You can configure **t3-options** for **t1** link 0 and channel group 0 only; for example, **ds-0/0/0:0:0**.
- You can configure **t1-options** for any **t1** link value, but only for channel group 0; for example, **ds-0/0/0:x:0.**
- There are no restrictions on changing the default **ds0-options**.
- If you delete a configuration you previously committed for channel group 0, the options return to the default values.

To configure the channel groups and time slots for a channelized DS3 interface, include the **channel-group** and **timeslots** statements at the **[edit chassis fpc slot-number pic *pic-number* ct3 port *port-number* t1 *link-number*]** hierarchy level:

[edit chassis fpc *slot-number* pic *pic-number* ct3 port *port-number* t1 *link-number*]
channel-group *channel-number* timeslots *slot-number*;

NOTE: If you commit the interface name but do not include the [edit chassis] configuration, the Channelized DS3-to-DS0 PIC behaves like a Channelized DS3-to- DS1 PIC: none of the DS0 functionality is accessible.

NOTE: The FPC slot range depends on the platform. The maximum range of 0 through 7 applies to M40 routers; for M20 routers, the range is 0 through 3; for M10 routers the range is 0 through 1; for M5 routers, the only applicable value is 0. The Multichannel DS3 (Channelized DS3-to-DS0) PIC is not supported on M160 routers.

Bandwidth limitations restrict the interface to a maximum of 128 channel groups per T3 port, rather than the theoretical maximum of 8 x 28 = 224.

There are 24 time slots on a T1 interface. You can designate any combination of time slots for usage, but you can use each time slot number on only one channel group within the same T1 link.

To use time slots 1 through 10, designate ***slot-number*** as in this example:

[edit chassis fpc 0 pic 1 ct3 port 5 t1 22]
channel-group 7 timeslots 1-10;

To use time slots 1 through 5, time slot 10, and time slot 24, designate ***slot-number*** as in this example:

[edit chassis fpc 2 pic *pic-number*1 ct3 port 0 t1 8]
channel-group 4 timeslots 1-5,10,24;

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

Related Documentation

- Ranges for Channelized DS3-to-DS0 Configuration on page 300

Ranges for Channelized DS3-to-DS0 Configuration

Table 24 on page 300 shows the ranges for each of the quantities in the preceding configuration.

Table 24: Ranges for Channelized DS3-to-DS0 Configuration

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

Table 24: 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 299

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 276
- *Configuring Virtual Tributary Mapping of Channelized STM1 Interfaces*

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

By default, the DS3/E3 MIC functions in clear-channel mode. To enable the DS3/E3 MIC to function in channelized mode, you need to use the software license S-MIC-3D-8CHDS3. To enable channelization, set the **channelization** statement at the **[edit chassis fpc *MPC-slot-number* pic *MIC-slot-number*]** hierarchy level. You can use the **channelization** option to channelize only individual DS3 interfaces.

NOTE:

- You can configure the **channelization** statement to enable channelization for the DS3/E3 MIC only. Moreover, you can use the **channelization** statement only on MX Series routers with Queuing and Enhanced Queuing MPCs (MX-MPC1-3D-Q, MX-MPC2-3D-Q, and MX-MPC2-3D-EQ) or on MX80 routers. Configuring the **channelization** statement on other MPCs does not have any effect, and the MICs continue to operate in clear-channel mode.
- Only clear-channel E3 mode is supported on the DS3/E3 MIC. Therefore, configuring the **channelization** statement does not impact the E3 functionality.

To configure channelization on the DS3/E3 MIC:

1. At the **[edit chassis]** hierarchy level in configuration mode, navigate to the hierarchy level that indicates the slot on which the DS3/E3 MIC is located.

   [edit chassis]
   user@host# **edit fpc *MPC-slot-number* pic *MIC-slot-number***

   For example, to navigate to the **[edit chassis fpc 1 pic 2]** hierarchy level:

   [edit chassis]
   user@host# **edit fpc 1 pic 2**

2. Configure the **channelization** statement.

   [edit chassis fpc *MPC-slot-number* pic *MIC-slot-number*]
   user@host# **set channelization**

   For example:

   [edit chassis fpc 1 pic 2]
   user@host# **set channelization**

3. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
fpc 1 {
    pic 2 {
        channelization;
    }
}
```

To enable the DS3/E3 MIC to function in clear-channel mode, you need to disable channelization. To do this, delete the **channelization** option at the **[chassis fpc *MPC-slot-number* pic *MIC-slot-number*]** hierarchy level.

To disable channelization on the DS3/E3 MIC:

1. At the **[edit chassis]** hierarchy level in configuration mode, navigate to the hierarchy level that indicates the slot on which the DS3/E3 MIC is located.

[edit chassis]
user@host# **edit fpc *MPC-slot-number* pic *MIC-slot-number***

For example:

[edit chassis]
user@host# **edit fpc 1 pic 2**

2. Delete the **channelization** statement.

[edit chassis fpc *MPC-slot-number* pic *MIC-slot-number*]
user@host# **delete channelization**

For example:

[edit chassis fpc 1 pic 2]
user@host# **delete channelization**

Related Documentation

- channelization on page 469

CHAPTER 16

Configuring Chassis Settings to Support Adaptive Services Interfaces

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

For Adaptive Services (AS) PICs, MultiServices PICs, and the internal Adaptive Services Module (ASM) in the M7i platform, there are two service packages: Layer 2 and Layer 3. Both service packages are supported on all adaptive services interfaces, but you can enable only one service package per PIC, with the exception of the combined package supported on the ASM. On a single router, you can enable both service packages by installing two or more PICs on the platform.

You enable service packages per PIC, not per port. For example, if you configure the Layer 2 service package, the entire PIC uses the configured package. To enable a service package, include the **service-package** statement at the **[edit chassis fpc *slot-number* pic *pic-number* adaptive-services]** hierarchy level, and specify **layer-2** or **layer-3**:

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

To determine which package an AS PIC supports, issue the **show chassis hardware** command: if the PIC supports the Layer 2 package, it is listed as **Link Services II**, and if it supports the Layer 3 package, it is listed as **Adaptive Services II**. To determine which package a MultiServices PIC supports, issue the **show chassis pic fpc-slot *slot-number* pic-slot *slot-number*** command. The **Package** field displays the value **layer-2** or **layer-3**.

NOTE: The ASM has a default option that combines the features available in the Layer 2 and Layer 3 service packages.

After you commit a change in the service package, the PIC is taken offline and then brought back online immediately. You do not need to manually take the PIC offline and online.

NOTE: Changing the service package causes all state information associated with the previous service package to be lost. You should change the service package only when there is no active traffic going to the PIC.

The services supported in each package differ by PIC and platform type.

Related Documentation

- Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 253

CHAPTER 17

Configuring Chassis Settings to Support External Clock Synchronization

Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers

The M40e, M120, M320, T640, and T1600 routers support an external synchronization interface that can be configured to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to that source.

This feature can be configured for external primary and secondary interfaces that use building-integrated timing system (BITS), SDH Equipment Timing Source (SETS) timing sources, or an equivalent quality timing source. When internal timing is set for SONET/SDH, Plesiochronous Digital Hierarchy (PDH), or digital hierarchy (DS-1) interfaces on the Physical Interface Cards (PICs), the transmit clock of the interface is synchronized to BITS/SETS timing and is traceable to timing within the network.

Routers and switches that support an external clock synchronization interface include:

- M40e, M120, and M320 routers
- T640 and T1600 routers

To configure external synchronization on the router, include the **synchronization** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
synchronization {
```

```
    signal-type (t1 | e1);
    switching--mode (revertive | non-revertive);
    y-cable-line-termination;
    transmitter-enable;
    validation-interval seconds;
    primary (external-a | external-b);
    secondary (external-a | external-b);
  }
```

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

- For the M120 and M320 routers, specify a signal type mode for interfaces, either **t1** or **e1**. For the M40e, T640, and T1600 routers, only the **t1** signal type mode is supported. The default setting is **t1**.
- For the T640 and T1600 routers, external clock interfaces are supported on the SONET Clock Generators (SCG-T-EC). The external clock interfaces on the SONET Clock Generators (SCG-T) are not supported.
- Specify the switching mode as **revertive** if a lower-priority synchronization can be switched to a valid, higher-priority synchronization.
- For the M320 router, specify that a single signal should be wired to both Control Boards (CBs) using a Y-cable. For the M40e router, the signal is wired to the CIP and Y-cable functionality is embedded in this system.

  The **y-cable-line-termination** option is not available on the M40e, M120, T640, and T1600 routers.
- Control whether the diagnostic timing signal is transmitted.

  The **transmitter-enable** option is not available on the M120, T640, and T1600 routers.
- Set a validation interval. The **validation-interval** option validates the synchronized deviation of the synchronization source. If revertive switching is enabled and a higher-priority clock is validated, the clock module is directed to the higher-priority clock, and all configured and active synchronizations are validated. The validation timer resumes after the current validation interval expires. The validation interval can be a value from 90 through 86,400 seconds. The default value is 90 seconds. For the M120 router, the range for the **validation-interval** option is 30 through 86,400 and the default value is **30**.
- Specify the primary external timing source by using the **primary (external-a | external-b)** statement.
- Specify the secondary external timing source by using the **secondary (external-a | external-b)** statement.

Related Documentation

- Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Routers on page 318

Configuring Clock Synchronization Interface on MX Series Routers

MX Series routers support external clock synchronization for Synchronous Ethernet, T1 or E1 line timing sources, and external inputs. Configuring external clock synchronization requires making clock selection, quality level, and priority considerations. The clock source selection algorithm is used to pick the two best upstream clock sources from among the various sources on the basis of system configuration and execution criteria such as quality level, priority, and hardware restrictions. For information about the clock synchronization options, see “Understanding Clock Synchronization on MX Series Routers” on page 145.

The following sections explain configuring clock synchronization options for MX Series routers:

NOTE:

Starting with Junos OS Release 13.3, the following scenarios occur when you configure Synchronous Ethernet without the **clock-class-to-quality-level-mapping** statement at the **[edit protocols ptp slave]** hierarchy level:

- Qualified clock source quality level (that is the secondary clock source quality level) is transmitted out of the external interface and the Ethernet interface during clock reference switchover when two clock sources on different MICs of the same FPC exist or when two clock sources on two different FPCs exist.
- Lower quality level is transmitted out the external interface and the Ethernet interface during clock reference switchover when two clock sources on the same MIC of an FPC exist due to hardware limitation.

Before you remove the SCBE from the router, you must delete the configuration under the **[edit chassis synchronization]** configuration command. Similarly, before you remove the SCBE2 from the router, you must delete the configuration under the **[edit chassis synchronization]** configuration command.

On SCBE2, the external-0/0 interface is located on **SCB0** and the external-1/0 interface is located on **SCB1**.

Configuring Clock Synchronization Options

To configure the clock synchronization options.

1. In configuration mode, go to the **[edit chassis synchronization]** hierarchy level.

   [edit]

user@host# **edit chassis synchronization**

2. Configure the Synchronous Ethernet clock selection mode as auto-select or free-run.

   [edit chassis synchronization]
   user@host# **set clock-mode (auto-select | free-run)**

3. Configure the ESMC transmit parameters on all the interfaces or on selected interfaces.

   [edit chassis synchronization]
   user@host# **set esmc-transmit interfaces (all |** ***interface-name)***

4. Configure the hold interval as configuration-change, which is the wait time (from 15 seconds through 60 seconds) after a change in configuration; restart, which is the wait time (from 60 seconds through 180 seconds) after reboot of the router; and switchover, which is the switchover wait time (from 30 seconds through 60 seconds) after clock recovery.

   [edit chassis synchronization]
   user@host# **set hold-interval configuration-change** ***secs***
   user@host# **set hold-interval restart** ***secs***
   user@host# **set hold-interval switchover** ***secs***

5. Configure the options for the external interfaces on the basis of the type of Enhanced Switch Control Board on your MX Series router.

   The SCBE has only one external interface. Configure the following options for SCBE:

   a. Go to the **[edit chassis synchronization interfaces external]** hierarchy level.

      [edit chassis synchronization]
      user@host# **edit interfaces external**

   b. Configure all the E1 interface-specific options—the **framing** statement as g704 or g704-no-crc, the **line-encoding** statement as ami or hdb3, and the **sabit** statement from 4 bits through 8 bits.

      [edit chassis synchronization interfaces external]
      user@host# **set e1-options framing (g704 | g704-no-crc)**
      user@host# **set e1-options line-encoding (ami | hdb3)**
      user@host# **set e1-options sabit** ***bit***

   c. Configure the **pulse-per-second-enable** statement to enable the pulse per second (PPS) signal to be received on the GPS interface.

      [edit chassis synchronization interfaces external]
      user@host# **set pulse-per-second-enable**

   d. Configure the frequency for the provided reference clock as 1 MHz, 5 MHz, 10 MHz, 2048 kHz, e1, or t1.

      [edit chassis synchronization interfaces external]
      user@host# **set signal-type (1hz | 5mhz | 10mhz | 2048khz | e1 | t1)**

   e. Configure the T1 interface-specific options—the **framing** statement as esf or sf and the **line-encoding** statement as ami or b8zs.

      [edit chassis synchronization interfaces external]
      user@host# **set t1-options framing (esf | sf)**


```
user@host# set t1-options line-encoding (ami | b8zs)
```

The SCBE2 has two external interfaces—external-0/0 and external-1/0. Configure the following options for SCBE2:

a. Go to the **[edit chassis synchronization interfaces external-0/0]** or **[edit chassis synchronization interfaces external-1/0]** hierarchy level.

```
[edit chassis synchronization]
user@host# edit interfaces external-0/0
```

OR

```
[edit chassis synchronization]
user@host# edit interfaces external-1/0
```

b. Configure all the E1 interface-specific options—the **framing** statement as g704 or g704-no-crc, the **line-encoding** statement as ami or hdb3, and the **sabit** statement from 4 bits through 8 bits-—on the external-0/0 interface or the external-1/0 interface.

```
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]
user@host# set e1-options framing (g704 | g704-no-crc)
user@host# set e1-options line-encoding (ami | hdb3)
user@host# set e1-options sabit bit
```

c. Configure the **pulse-per-second-enable** statement to enable the pulse per second (PPS) signal to be received on the GPS interface of the router.

```
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]
user@host# set pulse-per-second-enable
```

d. Configure the frequency for the provided reference clock as 1 MHz, 5 MHz, 10 MHz, 2048 kHz, e1, or t1.

```
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]
user@host# set signal-type (1hz | 5mhz | 10mhz | 2048khz | e1 | t1)
```

e. Configure the T1 interface-specific options—the **framing** statement as esf or sf and the **line-encoding** statement as ami or b8zs.

```
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]
user@host# set t1-options framing (esf | sf)
user@host# set t1-options line-encoding (ami | b8zs)
```

6. Configure the maximum transmit quality level as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc.

```
[edit chassis synchronization]
user@host# set max-transmit-quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e |
  stu | tnc)
```

7. Configure the EEC synchronization networking type as option-1 or option-2.

```
[edit chassis synchronization]
user@host# set network-option (option-1 | option-2)
```

8. Configure the options for the external clock interface output on the basis of the type of Enhanced Switch Control Board on your MX Series router.

   For SCBE:

   a. Go to the **[edit chassis synchronization output interfaces external]** hierarchy level.

      ```
      [edit chassis synchronization]
      user@host# edit output interfaces external
      ```

   b. Configure all the external clock interface output options. The options include the **holdover-mode-disable** statement; the **minimum-quality** statement, which can be set as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **source-mode** statement, which can be set as chassis or line; the **tx-dnu-to-line-source-enable** statement; and the **wander-filter-disable** statement.

      ```
      [edit chassis synchronization output interfaces external]
      user@host# set holdover-mode-disable
      user@host# set minimum-quality (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu |
        tnc)
      user@host# set source-mode (chassis | line)
      user@host# set tx-dnu-to-line-source-enable
      user@host# set wander-filter-disable
      ```

   For SCBE2:

   a. Go to the **[edit chassis synchronization output interfaces external-0/0]** hierarchy level or the **[edit chassis synchronization output interfaces external-1/0]** hierarchy level.

      ```
      [edit chassis synchronization]
      user@host# edit output interfaces (external-0/0 | external-1/0)
      ```

   b. Configure all the external clock interface output options on the external-0/0 interface or the external-1/0 interface. The options include the **holdover-mode-disable** statement; the **minimum-quality** statement, which can be set as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **source-mode** option, which can be set as chassis or line; the **tx-dnu-to-line-source-enable** statement; and the **wander-filter-disable** statement.

      ```
      [edit chassis synchronization output interfaces (external-0/0 | external-1/0)]
      user@host# set holdover-mode-disable
      user@host# set minimum-quality (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu |
        tnc)
      user@host# set source-mode (chassis | line)
      user@host# set tx-dnu-to-line-source-enable
      user@host# set wander-filter-disable
      ```

9. Configure the time-of-day message format as ASCII on the auxiliary port that receives the external clock signals.

   ```
   [edit chassis synchronization]
   user@host# set port auxiliary client time-of-day-format ascii string
   ```

10. Configure the **quality-mode-enable** statement to enable Synchronous Ethernet ESMC quality mode.

[edit chassis synchronization]
user@host# **set quality-mode-enable**

11. Configure the selection mode for the incoming ESMC quality as configured-quality or received-quality.

    [edit chassis synchronization]
    user@host# **set selection-mode (configured-quality | received-quality)**

12. Configure the options for the ESMC source related external clock source interface on the basis of the type of Enhanced Switch Control Board on your MX Series router.

    For SCBE:

    a. Go to the **[edit chassis synchronization source interfaces external]** hierarchy level or the **[edit chassis synchronization source interfaces *ethernet-interface-name*]** hierarchy level.

       [edit chassis synchronization]
       user@host# **edit source interfaces external**

       OR

       [edit chassis synchronization]
       user@host# **edit source interfaces *ethernet-interface-name***

    b. Configure the external clock interface and the Ethernet interface with their options. Configure the **priority** statement from 1 through 5; the **quality-level** statement as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **request** statement as force-switch or lockout. You can configure the same options for the Ethernet interfaces as well.

       [edit chassis synchronization source interfaces (external | *ethernet-interface-name*)]
       user@host# **set priority *value***
       user@host# **set quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu | tnc)**
       user@host# **set request (force-switch | lockout)**

    For SCBE2:

    a. Go to the **[edit chassis synchronization source interfaces (external-0/0]** hierarchy level or the **[edit chassis synchronization source interfaces (external-1/0]** hierarchy level.

       [edit chassis synchronization]
       user@host# **edit source interfaces external-0/0**

       OR

       [edit chassis synchronization]
       user@host# **edit source interfaces external-1/0**

    b. Configure the options on the external-0/0 interface or the external-1/0 interface. Set the **priority** statement from 1 through 5; the **quality-level** statement as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **request** statement as force-switch or lockout.

       [edit chassis synchronization source interfaces (external-0/0 |external-1/0)]
       user@host# **set priority *value***
       user@host# **set quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu | tnc)**

user@host# **set request (force-switch | lockout)**

13. Configure the switchover mode as revertive or non-revertive.

    [edit chassis synchronization]
    user@host# **set switchover-mode (non-revertive | revertive)**

Display the External Clock Synchronization Configuration for SCB

Purpose Display the options for external clock synchronization for SCB.

Action Execute the **show** command at **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host# show
synchronization {
    clock-mode (auto-select | free-run);
    esmc-transmit {
        interfaces (all | <interface-name>);
    }
    hold-interval {
        configuration-change <seconds>;
        restart <seconds>;
        switchover <seconds>;
    }
    interfaces <interface-name> {
        priority <number>;
        quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e |
 st4 | stu | tnc);
        request (force-switch | lockout);
        }
}
    max-transmit-quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e |stu
 | tnc);    # Applicable from 13.3 onwards
    network-type (option-1 | option-2);
    quality-mode-enable;
    selection-mode (configured-quality | received-quality);
    source {
        (external-a | external-b) {
        priority <number>;
        quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e |
 st4 | stu | tnc);
        request (force-switch | lockout);
    }
    switchover-mode (revertive | non-revertive);
}
```

Display the External Clock Synchronization Configuration for SCBE

Purpose Display the options for external clock synchronization for SCBE. Note that the SCBE has only one external interface.

Action Execute the show command at **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host# show
synchronization {
    clock-mode (auto-select | free-run);
    esmc-transmit {
```

```
            interfaces (all | <interface-name>);
        }
        hold-interval {
            configuration-change <seconds>;
            restart <seconds>;
            switchover <seconds>;
        }
        interfaces {
            external {
                e1-options {
                    framing (g704 | g704-no-crc4);
                    line-encoding (ami | hdb3);
                    sabit <number>;
                }
                pulse-per-second-enable;
                signal-type (1mhz | 5mhz | 10mhz | 2048khz | t1 | e1);
                t1-options {
                    framing (esf | sf);
                    line-encoding (ami | b8zs);
                }
            }
        }
        max-transmit-quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e |stu
    | tnc);   # Applicable from 13.3 onwards
        network-option (option-1 | option-2);
        output {
            interfaces {
                external {
                    holdover-mode-disable;
                   minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b |st2 | st3
    | st3e | st4 | stu | tnc);
                    source-mode (chassis | line);
                    tx-dnu-to-line-source-enable;
                    wander-filter-disable;
                }
           }
        }
        port {
            auxiliary client {
               time-of-day-format {
                   ascii <string>;
               }
            }
        }
        quality-mode-enable;
        selection-mode (configured-quality | received-quality);
        source {
            interfaces (<interface-name> | external) {
                    priority <number>;
                    quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3
   | st3e | st4 | stu | tnc);
                    request (force-switch | lockout);
             }
        }
        switchover-mode (revertive | non-revertive);
   }
```

Display the External Clock Synchronization Configuration for SCBE2

Purpose Display the options for external clock synchronization for SCBE2. SCBE2 has two external interfaces, external-0/0 and external-1/0.

Action Execute the show command at **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host# show
synchronization {
    clock-mode (auto-select | free-run);
    esmc-transmit {
        interfaces (all | <interface-name>);
    }
    hold-interval {
        configuration-change <seconds>;
        restart <seconds>;
        switchover <seconds>;
    }
    interfaces {
        (external-0/0 | external-1/0) {
            signal-type (1mhz | 5mhz | 10mhz | 2048khz | t1 | e1);
            e1-options {
                framing (g704 | g704-no-crc4);
                line-encoding (ami | hdb3);
                sabit <number>;
            }
            pulse-per-second-enable;
            t1-options {
                framing (esf | sf);
                line-encoding (ami | b8zs);
            }
        }
    }
    max-transmit-quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e |stu
 | tnc);
    network-option (option-1 | option-2);
    output {
        interfaces {
            (external-0/0 | external-1/0) {
                holdover-mode-disable;
               minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b |st2 | st3
 | st3e | st4 | stu | tnc);
                source-mode (chassis | line);
                tx-dnu-to-line-source-enable;
                wander-filter-disable;
            }
        }
    }
    port {
        auxiliary client {
           time-of-day-format {
               ascii <string>;
           }
        }
    }
    quality-mode-enable;
    selection-mode (configured-quality | received-quality);
    source {
        interfaces {
```



```
            (external-0/0 | external-1/0 | <interface-name>) {
                priority <number>;
                quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3
| st3e | st4 | stu | tnc);
                request (force-switch | lockout);
          }
    }
    switchover-mode (revertive | non-revertive);
}
```

Related Documentation

- Centralized Clocking Overview on page 126
- Example: Configuring Synchronous Ethernet on MX Series Routers on page 320
- **request chassis synchronization mode on page 670**
- **show chassis synchronization (MX Series Routers) on page 1550**
- **synchronization on page 581**
- Understanding Clock Synchronization on MX Series Routers on page 145

Clock Sources for PTX Series Packet Transport Routers

System clocking on PTX Series Packet Transport Routers is controlled by a Centralized Clock Generator (CCG). The CCG is capable of deriving a master clock from a valid source and synchronizing all interfaces on the chassis to this master clock. The CCG plugs into the rear of the chassis. A pair of CCGs installed in the chassis provide a redundant fallback option.

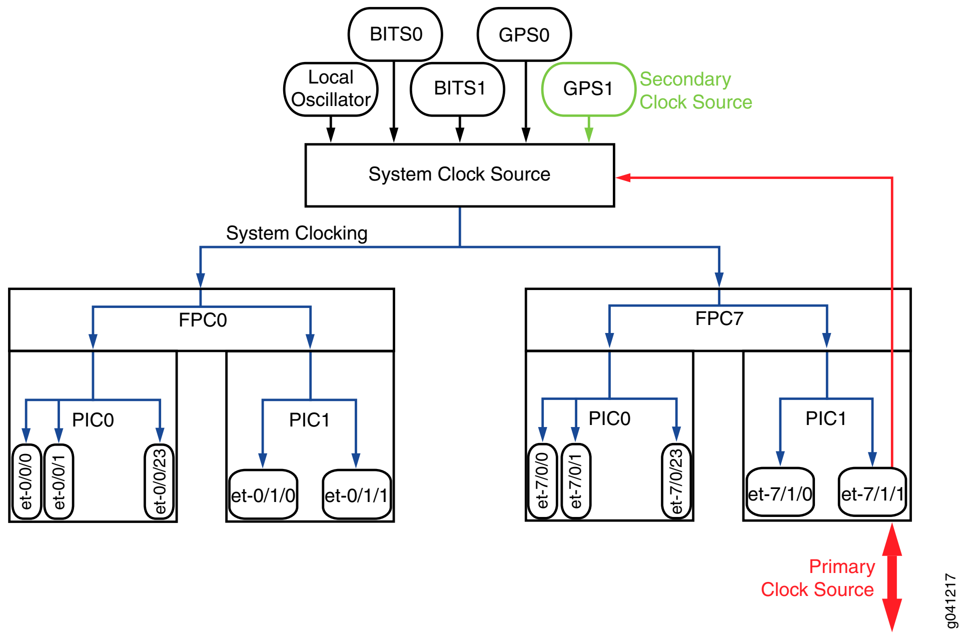
PTX Series Packet Transport Routers can use an internal clock source or it can extract clocking from an external source.

Clock sources and specifications include:

- The PTX Series Packet Transport Router clock is a Stratum 3E-compliant clock with Free Run +/- 4.6 ppm/20 years, Holdover +/- 0.01 ppm/24 hours, and Drift +/- 0.001 ppm/24 hours.
- The internal clock is based on Freerun OCXO with +/- 10 ppb accuracy.
- External clocking includes a choice of GPS-based clock recovery (5 MHz and 10 MHz) or BITS-T1/E1 Line synchronization (1.544 MHz and 2.048 MHz)
- Synchronous Ethernet is supported based on the ITU G.8261 and G.8262 specifications with line timing from the 10-Gigabit Ethernet, 40-Gigabit Ethernet, or 100-Gigabit Ethernet interface.

  Synchronous Ethernet is a key requirement for circuit (emulation) services and mobile radio access technologies. Synchronous Ethernet supports sourcing and transfer of frequency for synchronization purposes for both wireless and wireline services and is primarily used for mobile backhaul and converged transport.

Figure 3: Clocking Example for PTX Series Packet Transport Routers



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

Related Documentation

- Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Routers on page 318
- **recovered-clock on page 559**
- **synchronization on page 579**

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

The PTX Series Packet Transport Routers support an external synchronization interface that can be configured to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to that source.

This feature can be configured for external primary and secondary interfaces that use building-integrated timing system (BITS), SDH Equipment Timing Source (SETS) timing sources, or an equivalent quality timing source. On the Physical Interface Cards (PICs), the transmit clock of the interface is synchronized to BITS/SETS timing and is traceable to timing within the network.

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

- Provides a synchronous Ethernet clock source to the chassis.

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

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

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

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

To configure external synchronization on the router, include the **synchronization** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
synchronization {
  signal-type (t1 | e1);
  switching--mode (revertive | non-revertive);
  transmitter-enable;
  primary (external-a | external-b | fpc-slot-number | gps-0-10mhz | gps-0-5mhz |
    gps-1-10mhz | gps-1-5mhz |bits-a | bits-b);
  secondary (external-a | external-b | fpc-slot-number | gps-0-10mhz | gps-0-5mhz |
    gps-1-10mhz | gps-1-5mhz |bits-a | bits-b);
}
```

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

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

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

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

Related Documentation

- Clock Sources for PTX Series Packet Transport Routers on page 317
- **recovered-clock on page 559**

- synchronization on page 579

Example: Configuring Synchronous Ethernet on MX Series Routers

Requirements

This example uses the following hardware and software components:

- One MX80-T, MX5-T, MX10-T, MX40-T, MX80, MX240, MX480, or MX960 router
- Junos OS Release 10.4 or later for MX80 3D Universal Edge Routers and 11.2R4 or later for MX80-T, MX5, MX10, MX40, MX240, MX480, and MX960 routers.

Overview

You can configure Synchronous Ethernet on MX5-T, MX10-T, MX40-T, MX80, MX80-T, MX240, MX480, and MX960 routers, which enables you to synchronize clocks between nodes in a network through frequency synchronization.

NOTE: You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

Configuration

CLI Quick Configuration

To quickly configure synchronization on the aforementioned routers, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

```
[edit]

set chassis synchronization clock-mode auto-select
set chassis synchronization network-type option-1
set chassis synchronization quality-mode-enable
set chassis synchronization selection-mode configured-quality
set chassis synchronization switchover-mode revertive
set chassis synchronization hold-interval configuration-change 1 restart 1 switchover 1
set chassis synchronization esmc-transmit interfaces ge-2/0/0
set chassis synchronization source external-a priority 2 quality-level prc request
force-switch
set chassis synchronization interfaces ge-2/0/0 priority 1 quality-level prc request
force-switch wait-to-restore 1
```


Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

For step-by-step configuration, see "Configuring Clock Synchronization Interface on MX Series Routers" on page 309.

To configure Synchronous Ethernet, perform the following tasks:

1. Configure the clock mode, network type, quality mode, selection mode, and switchover mode.

   ```
   [edit chassis synchronization]
   user@host# set clock-mode auto-select network-type option-1 quality-mode-enable
     selection-mode configured-quality switchover-mode revertive
   ```

2. Configure the hold interval for configuration change, restart interval, and the switchover interval in seconds.

   ```
   [edit chassis synchronization]
   user@host# set hold-interval configuration-change 1 restart 1 switchover 1
   ```

3. Configure the interfaces for transmitting ESMC.

   ```
   [edit chassis synchronization]
   user@host# set esmc-transmit interfaces ge-2/0/0
   ```

4. Configure the source node with its quality level, priority, and request type.

   ```
   [edit chassis synchronization]
   user@host# set source external-a priority 2 quality-level prc request force-switch
   ```

5. Configure the interfaces with priority, quality level, request type, and time to restore the interface to default.

   ```
   [edit chassis synchronization]
   user@host# set interfaces ge-2/0/0 priority 1 quality-level prc request force-switch
     wait-to-restore 1
   ```

Results

Display the results of the configuration:

```
user@host# show chassis
synchronization {
  clock-mode (auto-select | free-run);
  esmc-transmit {
    interfaces (all | interface-name);
  }
  hold-interval {
    configuration-change seconds;
    restart seconds;
    switchover seconds;
  }
  network-type (option-1 | option-2);
  quality-mode-enable;
  selection-mode (configured-quality|received-quality);
  switchover-mode (revertive | non-revertive);
  source {
    (external-a | external-b) {
```



```
                priority number;
                quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
                request (force-switch | lockout);
            }
            interfaces interface-name {
                priority number;
                quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
                request (force-switch | lockout);
                wait-to-restore minutes;
            }
        }
    }
```

Verification

Confirm that the configuration is working properly.

Verifying the Basic Parameters for Synchronization

Purpose Verify that the basic synchronization parameters such as the current clock status, clock locked to, and configured sources are working as expected.

Action From operational mode, enter the **run show chassis synchronization** command to display the synchronization details.

Meaning The output displays the basic synchronization parameters configured on the interface.

Verifying All the Parameters for Synchronization

Purpose Verify that all the synchronization parameters are working as expected.

Action From operational mode, enter the **run show chassis synchronization extensive** command to display all the synchronization details.

Meaning The output displays all the synchronization parameters configured on the interface.

Verifying the Global Configuration

Purpose Verify that all the global configuration parameters are working as expected.

Action From operational mode, enter the **run show synchronous-ethernet global-information** command to display the set parameters for the global configuration.

Meaning The output displays global information about the configured node.

Verifying the ESMC Transmit Parameters

Purpose Verify that the transmission parameters of ESMC on the interface are working as expected.

Action From operational mode, enter the **run show synchronous-ethernet esmc transmit detail** command to display the set parameters for the ESMC transmission.

Meaning The output displays all the transmission details about the configured ESMC interface.

Verifying the ESMC Statistics Parameters

Purpose Verify the statistics related to ESMC on the interface.

Action From operational mode, enter the **run show synchronous-ethernet esmc statistics** command to display the statistics for the ESMC transmission.

Meaning The output displays information about the ESMC statistics.

Verifying That the ESMC Statistics Are Cleared

Purpose Clear the statistics related to ESMC on the interface.

Action From operational mode, enter the **clear synchronous-ethernet esmc statistics** command to clear the statistics for the ESMC transmission.

Meaning The output displays the message that the ESMC statistics have been cleared.

Related Documentation

- Clock Sources for PTX Series Packet Transport Routers on page 317
- Configuring Clock Synchronization Interface on MX Series Routers on page 309
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 324
- **request chassis synchronization mode on page 670**
- **show chassis synchronization (MX Series Routers) on page 1550**
- **synchronization (MX Series) on page 581**
- Synchronous Ethernet Overview on page 133

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

Requirements

This example uses the following hardware and software components:

- Junos OS Release 11.4 or later for MX80-T, MX240, MX480, or MX960 routers
- One MX80-T, MX240, MX480, and MX960 router with 10-Gigabit Ethernet MIC with XFP

Overview

You can set the framing mode at the PIC level and at the interface level with various configuration combinations. For more information about the various configuration combinations, see "Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview" on page 139.

This example provides information about configuring framing mode at the interface level and the PIC level for Synchronous Ethernet on the 10-Gigabit Ethernet MIC with XFP.

The 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet in LAN-PHY framing mode. This is possible only when all the logical PICs under the given Modular Interface Card (MIC) and its ingress interfaces are configured in LAN framing mode.

You can also alternatively configure a MIC in WAN-PHY framing mode on MX80, MX240, MX480, and MX960 routers by configuring all the constituent logical PICs in the same WAN-PHY framing mode in any one of the following configurations:

- No framing mode configured on all the constituent logical PICs of the MIC.
- Incompatible framing mode configured on constituent logical PICs of the MIC.
- No framing mode configured on some of the constituent logical PICs of the MIC.

NOTE: By default, the PIC-level framing mode is set to WAN framing type, that is **e1 | e3 | sdh | sonet | t1 | t3**. Synchronous Ethernet works on 10-Gigabit Ethernet MIC with XFP in LAN-PHY mode only when the PIC level framing configuration is configured to **lan** framing type explicitly.

By default, the interface-level framing mode is set to **lan-phy**. For WAN-PHY operation, interface framing needs to be set to **wan-phy** framing explicitly.

NOTE: You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

Configuration

CLI Quick Configuration

To quickly configure PIC-level framing and interface-level framing on the 10-Gigabit Ethernet MIC with XFP, copy the following commands and paste it into the CLI.

```
[edit]
```

```
set chassis fpc 2 pic 0 framing lan
set chassis fpc 2 pic 1 framing lan
set interfaces xe-2/1/0 framing-mode lan-phy
```

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

For step-by-step configuration of Synchronous Ethernet, see "Configuring Clock Synchronization Interface on MX Series Routers" on page 309.

Step-by-Step Procedure

To configure PIC-level framing on the 10-Gigabit Ethernet MIC with XFP, perform the following tasks:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

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

2. Configure the FPC slot and the first PIC slot.

   ```
   [edit chassis]
   user@host# edit fpc 2 pic 0
   ```

3. Configure the framing type as LAN on the first PIC slot.

   ```
   [edit chassis fpc2 pic 0]
   user@host# set framing lan
   ```

4. Configure the FPC slot and the second PIC slot.

   ```
   [edit chassis]
   user@host# edit fpc 2 pic 1
   ```

5. Configure the framing type as LAN on the second PIC slot.

   ```
   [edit chassis fpc2 pic 0]
   user@host# set framing lan
   ```

Step-by-Step Procedure

To configure interface-level framing on the 10-Gigabit Ethernet MIC with XFP, perform the following tasks:

1. In configuration mode, go to the **[edit interfaces]** hierarchy level and set the interface as **xe-2/1/0**.

```
[edit]
user@host# edit interfaces xe-2/1/0
```

2. Configure the interface in LAN-PHY framing mode.

```
[edit interfaces xe-2/1/0]
user@host# set framing-mode lan-phy
```

Results

Display the results of the configuration at the PIC level:

```
[edit]
user@host# show
chassis {
  fpc 2 {
    pic 0 {
      framing lan;
    }
  }
  fpc 2 {
    pic 1 {
      framing lan;
    }
  }
}
```

Display the results of the configuration at the interface level:

```
[edit]
user@host# show
interfaces xe-2/1/0 {
  framing-mode lan-phy;
}
```

Related Documentation

- Clock Sources for PTX Series Packet Transport Routers on page 317
- Configuring Clock Synchronization Interface on MX Series Routers on page 309
- **request chassis synchronization mode on page 670**
- **show chassis synchronization (MX Series Routers) on page 1550**
- Synchronous Ethernet Overview on page 133
- Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 139
- **synchronization (MX Series) on page 581**

CHAPTER 18

Configuring Chassis Setting to Support Precision Time Protocol

Configuring Precision Time Protocol

You can configure the master clock and the slave clock for Precision Time Protocol (PTP) to help synchronize clocks in a distributed system. This time synchronization is achieved through packets that are transmitted and received in a session between the master clock and the slave clock.

Configuring Precision Time Protocol and its Options

This topic includes the following tasks:

Configuring PTP Options

To configure PTP options:

1. In configuration mode, go to the **[edit protocols ptp]** hierarchy level:

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

2. Configure the clock mode as either boundary or ordinary. This attribute is mandatory and has no default value.

   The **boundary** option signifies that the clock can be both a master clock and a slave clock. The **ordinary** option signifies that the clock is either a master clock or a slave clock.

   ```
   [edit protocols ptp]
   user@host# set clock-mode (boundary | ordinary)
   ```

3. Configure the PTP domain option with values from 0 through 127. The default value is 0.

   [edit protocols ptp]
   user@host# **set domain *domain-value***

4. Configure the **priority1** option with values from 0 through 254. The default value is 128.

   The **priority1** value determines the best master clock. The *priority1-value* is also advertised in the master clock's announce message to other slaves.

   [edit protocols ptp]
   user@host# **set priority1 *priority1-value***

5. Configure the **priority2** option with values from 0 through 255. The default value is 128.

   The **priority2** value differentiates and prioritizes the master clock to avoid confusion when ***priority1-value*** is the same for different master clocks in a network.

   [edit protocols ptp]
   user@host# **set priority2 *priority2-value***

6. Configure the **unicast-negotiation** option to enable unicast negotiation.

   Unicast negotiation is a method by which the announce, sync, and delay response packet rates are negotiated between the master clock and the slave clock before a PTP session is established.

   [edit protocols ptp]
   user@host# **set unicast-negotiation**

   NOTE: Unicast negotiation, when enabled, does not allow you to commit any packet rate–related configuration.

Configuring Slave Clock Options

Configure the following options after the aforementioned PTP options have been set.

1. Configure the slave clock.

   [edit protocols ptp]
   user@host# **edit slave**

2. Configure the **announce-timeout** option in the slave node with values from 2 through 10. The default value is 3.

   The announce timeout value signifies the number of times an announce interval message has to pass through the slave without receiving the announce message—that is, the timeout period for announce messages.

   [edit protocols ptp slave]
   user@host# **set announce-timeout *announce-timeout-value***

3. Configure the **delay-request** option in the slave node with values from –6 through 6. The default value is –4.

The delay request value is the logarithmic mean interval in seconds between the delay request messages sent by the slave to the master.

[edit protocols ptp slave]
user@host# **set delay-request *delay-request-value***

4. Configure the **frequency-only** option to enable only frequency synchronization in the slave.

   [edit protocols ptp slave]
   user@host# **set frequency-only**

   NOTE: This option is configured only when PTP is used for frequency synchronization and not for phase synchronization. Also, note that this option can only be set for an ordinary clock acting as slave.

5. Configure the interface for the slave.

   [edit protocols ptp slave]
   user@host# **edit interface *interface-name***

6. Configure the **unicast-mode** option for the slave. You can set this option when PTP unicast mode of messaging is needed.

   [edit protocols ptp slave interface *interface-name*]
   user@host# **edit unicast-mode**

7. Configure the **transport** option in unicast mode as IPv4.

   The encapsulation type for PTP packet transport is IPv4.

   [edit protocols ptp slave interface *interface-name* unicast-mode]
   user@host# **set transport ipv4**

8. Configure the IP address of the master.

   [edit protocols ptp slave interface *interface-name* unicast-mode]
   user@host# **edit clock-source *ip-address***

9. Configure the IP address of the interface acting as the local PTP slave port.

   [edit protocols ptp slave interface *interface-name* unicast-mode clock-source *ip-address*]
   user@host# **set local-ip-address *local-ip-address***

   NOTE: You must configure this IP address at the [**edit interfaces *interface-name***] hierarchy level.

Configuring Master Clock Options

Configure the following options after the aforementioned PTP options and slave clock options have been set.

1. Configure the master clock.

   [edit protocols ptp]
   user@host# **edit master**

2. Configure the **announce interval** option for the master with values from 0 through 4. The default value is 1.

   The announce interval is the logarithmic mean interval between announce messages that is sent by the master. By default, one announce message is sent in every two seconds.

   ```
   [edit protocols ptp master]
   user@host# set announce-interval announce-interval-value
   ```

3. Configure the **clock step** option as either one-step or two-step for the master. The default value is one-step.

   The clock step determines whether the timing information is sent along with the sync message only (one-step) or a subsequent follow-up message (two-step) is sent corresponding to the previous sync message.

   ```
   [edit protocols ptp master]
   user@host# set clock-step (one-step | two-step)
   ```

4. Configure the **sync interval** option for the master clock with values from –6 through 6. The default value is –6.

   The sync interval is the logarithmic mean interval between synchronous messages that is sent by the master. By default, 64 synchronous interval messages are sent per second.

   ```
   [edit protocols ptp master]
   user@host# set sync-interval sync-interval-value
   ```

5. Configure the interface for the master.

   ```
   [edit protocols ptp master]
   user@host# edit interface interface-name
   ```

6. Configure the unicast mode option for the master. You can set this option when PTP unicast mode of messaging is needed.

   ```
   [edit protocols ptp master interface interface-name]
   user@host# edit unicast-mode
   ```

7. Configure the **transport** option in unicast mode as IPv4.

   The encapsulation type for PTP packet transport is IPv4.

   ```
   [edit protocols ptp master interface interface-name unicast-mode]
   user@host# set transport ipv4
   ```

8. Configure the IP address for the slave.

   ```
   [edit protocols ptp master interface interface-name unicast-mode]
   user@host# edit clock-client ip-address
   ```

9. Configure the IP address of the interface acting as the local PTP master port.

   ```
   [edit protocols ptp master interface interface-name unicast-mode clock-client
     ip-address]
   user@host# set local-ip-address local-ip-address
   ```


Related Documentation

- [edit protocols ptp] Hierarchy Level on page 458
- Precision Time Protocol Overview on page 143
- Example: Configuring Precision Time Protocol on page 331

Example: Configuring Precision Time Protocol

Requirements for PTP Configuration

This example uses the following hardware and software components:

- One MX80, MX240, MX480, or MX960 router
- Junos OS Release 12.2 or later

Overview

This example shows the configuration of Precision Time Protocol (PTP) on all Ethernet Modular Interface Cards (MICs) on the enhanced Module Port Concentrator (MPCE) MX-MPC2E-3D-P on MX240, MX480, and MX960 routers and on the MX80 3D Universal Edge Routers with precision timing support (MX80-P).

PTP synchronizes clocks between nodes in a network, thereby enabling the distribution of an accurate clock over a packet switched network. This synchronization is achieved through packets that are transmitted and received in a session between the master clock and the slave clock. PTP also supports boundary clock.

NOTE: You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

Configuration

CLI Quick Configuration

To quickly configure PTP on an interface, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

[edit]

set protocols ptp clock-mode boundary priority1 1 priority2 2 domain 0 unicast-negotiation
set protocols ptp slave announce-timeout 2 delay-request –4 frequency-only
set protocols ptp slave interface ge-1/2/3.0 unicast-mode transport ipv4
set protocols ptp slave interface ge-1/2/3.0 unicast-mode clock-source 2.2.2.2 local-ip-address 3.3.3.3

set protocols ptp master announce-interval 0 clock-step one-step sync-interval 0
set protocols ptp master interface ge-1/2/0.3 unicast-mode transport ipv4
set protocols ptp master interface ge-1/2/0.3 unicast-mode clock-client 10.10.1.1 local-ip-address 100.1.1.1

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

For step-by-step configuration, see "Configuring Precision Time Protocol" on page 327.

To configure PTP, perform the following tasks:

1. Configure the clock mode, priorities, domain, and unicast negotiation options for PTP.

   ```
   [edit protocols ptp]
   user@host# set clock-mode boundary priority1 1 priority2 2 domain 0
     unicast-negotiation
   ```

2. Configure the announce timeout, delay request, interface IP address, and encapsulation type for the slave.

   ```
   [edit protocols ptp slave]
   user@host# set announce-timeout 2 delay-request 0 interface ge-1/2/3.0 unicast-mode
     transport ipv4
   ```

3. Configure the **clock master** option and the **local-ip-address** option for the slave node.

   ```
   [edit protocols ptp slave interface ge-1/2/3.0 unicast-mode]
   user@host# set clock-source 2.2.2.2 local-ip-address 3.3.3.3
   ```

4. Configure the announce interval, clock step, synchronous interval, interface IP address, and encapsulation type for the master.

   ```
   [edit protocols ptp master]
   user@host# set announce-interval 0 clock-step one-step sync-interval 0 interface
     ge-1/2/3.0 unicast-mode transport ipv4
   ```

5. Configure the clock client for the master.

   ```
   [edit protocols ptp master interface ge-1/2/3.0 unicast-mode]
   user@host# set clock-client10.10.1.1 local-ip-address 100.1.1.1
   ```

Results Display the results of the configuration:

```
[edit protocols ptp]
user@host# show
{
  clock-mode boundary;
  domain 0;
  priority1 1;
  priority2 2;
  unicast-negotiation;
  slave {
    announce-timeout 2;
    delay-request 0
    frequency-only;
    interface ge-1/2/3.0 {
```



```
            unicast-mode {
                transport ipv4;
                clock-source 2.2.2.2 {
                    local-ip-address 3.3.3.3;
                }
            }
        }
    }
    master {
        announce-interval 0;
        clock-step one-step;
        sync-interval 0;
        interface ge-1/2/3.0 {
            unicast-mode {
                transport ipv4;
                clock-client 3.3.3.3 {
                    local-ip-address 1.0.1.0;
                }
            }
        }
    }
}
```

Verification

Confirm that the configuration is working properly.

Verifying the PTP Clock Details

Purpose Verify that the PTP clock is working as expected.

Action In operational mode, enter the **run show ptp clock** command to display the clock details.

Meaning The output displays the clock details, which include the parameters configured on the node. For more information about the **run show ptp clock** operational command, see show ptp clock.

Verifying the Lock Status of the Slave

Purpose Verify that the slave clock is aligned to the master clock by checking the lock status of the slave.

Action In operational mode, enter the **run show ptp lock-status** command to display the lock status of the slave.

Meaning The output displays information about the lock status of the slave. The output shows whether the slave is aligned to the master clock or not. For more information about the **run show ptp lock-status** operational command, see show ptp lock-status.

Verifying the PTP Options on the Slave

Purpose Verify the PTP options that are set on the slave and its current status.

Action In operational mode, enter the **run show ptp slave** command to display the configured slave.

Meaning The output displays information about the configured slave and the status of the slave. For more information about the **run show ptp slave** operational command, see show ptp slave.

Verifying the PTP Options and the Current Status of the Master

Purpose Verify the PTP options that are set for the master and its current status.

Action In operational mode, enter the **run show ptp master** command to display the configured options for the master.

Meaning The output displays information about the configured master and the current status of the master. For more information about the **run show ptp master** operational command, see show ptp master.

Verifying the Number and Status of the PTP Ports

Purpose Verify the number of PTP ports and their current status.

Action In operational mode, enter the **run show ptp port** command to display the configured ports.

Meaning The output displays information about the number of ports created according to the configuration and their current status. For each unique local IP address, one PTP port is created. For more information about the **run show ptp port** operational command, see show ptp port.

Related Documentation

- [edit protocols ptp] Hierarchy Level on page 458
- Configuring Precision Time Protocol on page 327
- Precision Time Protocol Overview on page 143

CHAPTER 19

Configuring Chassis Setting to Support Hybrid Mode

Configuring Hybrid Mode and ESMC Quality Level Mapping

You can configure hybrid mode (that is, the combined operation of Synchronous Ethernet and Precision Time Protocol (PTP)) on MX240, MX480, and MX960 3D Universal Edge Routers and on MX80 3D Universal Edge Routers with precision timing support (MX80-P) and with timing support (MX80-T). On the MX240, MX480, and MX960 routers, the combined operation is possible only when the PTP client and the Synchronous Ethernet source are on the same enhanced Modular Port Concentrator (MPC) and are traceable to the same master. When acting as a PTP slave, an MX80-P or MX80-T router can accept any external Synchronous Ethernet clock as reference. Note that when the selected Synchronous Ethernet reference fails, the router continues to work in PTP mode.

In hybrid mode, the synchronous Ethernet equipment clock (EEC) on the MPC derives the frequency from Synchronous Ethernet and the phase and time of day from PTP.

The hybrid mode is configured on the slave. On the slave, one or more interfaces are configured as Synchronous Ethernet source interfaces.

The ESMC quality level value is mapped to the clock class value either by mapping the PTP clock class to the ESMC quality level or by configuring a user-defined mapping of PTP clock class to ESMC quality level. For more information , see "Understanding ESMC Quality Level Mapping" on page 160. The following procedures explain configuring hybrid mode with either of the modes in detail.

Configuring the Router in Hybrid Mode

To configure the router in hybrid mode, you must:

1. Configure Synchronous Ethernet options at the **[edit chassis synchronization]** hierarchy level:
   - Configure the **auto-select** mode of operation. You can select the clock source either from a free-run local oscillator or from an external qualified clock.

     When the router is configured with the **auto-select** option, the router chooses up to two best upstream clock sources. It then uses the clock recovered from one of the sources to lock the chassis clock. If an upstream clock with acceptable quality is not available or if the router is configured in free-run mode, the router uses the internal oscillator.
   - Configure the **esmc-transmit** and **network-option** options at the **[edit chassis synchronization** hierarchy level.
   - Configure one or more interfaces at the **[edit chassis synchronization]** hierarchy level as Synchronous Ethernet sources as needed.
2. Configure PTP options at the **[edit protocols ptp]** hierarchy level.
3. Configure hybrid mode options at the **[edit protocols ptp slave]** hierarchy level.

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

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

1. In configuration mode, go to the **[edit protocols ptp slave]** hierarchy level:

   [edit]
   user@host# **edit protocols ptp slave**
2. Configure the **convert-clock-class-to-quality-level** option to set the default mapping between the ESMC SSM quality level and the PTP clock class.

   [edit protocols ptp slave]
   user@host# **set convert-clock-class-to-quality-level**
3. Configure the hybrid mode option on the slave.

   [edit protocols ptp slave]
   user@host# **edit hybrid**
4. Configure the Synchronous Ethernet mapping option in hybrid mode.

   [edit protocols ptp slave hybrid]
   user@host# **edit synchronous-ethernet-mapping**
5. Configure the IP address of the clock source.

   [edit protocols ptp slave hybrid synchronous-ethernet-mapping]
   user@host# **edit clock-source *ip-address***
6. Configure one or more Synchronous Ethernet source interfaces for the slave as needed.

[edit protocols ptp slave hybrid synchronous-ethernet-mapping clock-source *ip-address*]
user@host# **set interface** ***interface1-name***
user@host# **set interface** ***interface2-name***

NOTE: You must first configure these interfaces at the **[edit chassis synchronization]** hierarchy level as Synchronous Ethernet sources. For information about configuring these interfaces, see synchronization (MX Series).

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

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

1. In configuration mode, go to the **[edit protocols ptp slave]** hierarchy level:

   [edit]
   user@host# **edit protocols ptp slave**

2. To override the default mapping option, perform the following steps:

   a. Configure the **clock-class-to-quality-level-mapping** option with one of the quality level values. The quality level values are prc, prs, sec, smc, ssu-a, ssu-b, st2, st3, st3e, st4, stu, and tnc.

      [edit protocols ptp slave]
      user@host# **edit clock-class-to-quality-level-mapping quality-level prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc**

   b. Configure the **clock-class** option for the set quality level. The clock class value ranges from 80 through 109.

      [edit protocols ptp slave clock-class-to-quality-level-mapping quality-level *quality-level-value*]
      user@host# **set clock-class** ***clock-class***

3. Configure the hybrid mode option on the slave.

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

4. Configure the Synchronous Ethernet mapping option in hybrid mode.

   [edit protocols ptp slave hybrid]
   user@host# **edit synchronous-ethernet-mapping**

5. Configure the IP address of the clock source.

   [edit protocols ptp slave hybrid synchronous-ethernet-mapping]
   user@host# **edit clock-source** ***ip-address***

6. Configure one or more Synchronous Ethernet source interfaces for the slave as needed.

   [edit protocols ptp slave hybrid synchronous-ethernet-mapping clock-source *ip-address*]
   user@host# **set interface** ***interface1-name***
   user@host# **set interface** ***interface2-name***

NOTE: You must first configure these interfaces at the **[edit chassis synchronization]** hierarchy level as Synchronous Ethernet sources. For information about configuring these interfaces, see synchronization (MX Series).

For information about verifying the aforementioned procedure, see "Example: Configuring Hybrid Mode and ESMC Quality Level Mapping" on page 338.

Related Documentation

- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 338
- Understanding Hybrid Mode on page 164
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133

Example: Configuring Hybrid Mode and ESMC Quality Level Mapping

This example shows the configuration of hybrid mode by mapping the PTP clock class to the ESMC quality level and also by configuring a user-defined mapping of the PTP clock class to the ESMC quality level on MX240 3D Universal Edge Routers.

Requirements for Hybrid Mode Configuration

This example uses the following hardware and software components:

- One MX240 router.
- Junos OS Release 12.2R2 or later.

Overview

The combined operation of Synchronous Ethernet and Precision Time Protocol (PTP) is also known as hybrid mode. In hybrid mode, the synchronous Ethernet equipment clock (EEC) on the Modular Port Concentrator (MPC) derives the frequency from Synchronous Ethernet and the phase and time of day from PTP.

You can configure hybrid mode on MX240, MX480, and MX960 3D Universal Edge Routers and on MX80 3D Universal Edge Routers with precision timing support (MX80-P) and with timing support (MX80-T). On the MX240, MX480, and MX960 routers, the combined operation is possible only when the PTP slave and the Synchronous Ethernet source are on the same enhanced MPC and are traceable to the same master. When acting as a PTP slave, an MX80-P or MX80-T router can accept any external Synchronous Ethernet clock as reference. Note that when the selected Synchronous Ethernet reference fails, the router continues to work in PTP mode.

Hybrid mode is configured on the slave. On the slave, one or more interfaces are configured as Synchronous Ethernet source interfaces.

NOTE: You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

The ESMC quality level value is mapped to the clock class value either by mapping the PTP clock class to the ESMC quality level or by configuring a user-defined mapping of the PTP clock class to the ESMC quality level. For more information, see "Understanding ESMC Quality Level Mapping" on page 160. The following examples explain configuring hybrid mode with either of the modes in detail.

To configure the router in hybrid mode, you must:

1. Configure Synchronous Ethernet options at the **[edit chassis synchronization]** hierarchy level:
   - Configure the **auto-select** mode of operation. You can select the clock source either from a free-run local oscillator or from an external qualified clock.

     When the router is configured with the **auto-select** option, the router chooses up to two best upstream clock sources. It then uses the clock recovered from one of the sources to lock the chassis clock. If an upstream clock with acceptable quality is not available or if the router is configured in free-run mode, the router uses the internal oscillator.
   - Configure the **esmc-transmit** and **network-option** options at the **[edit chassis synchronization]** hierarchy level.
   - Configure one or more interfaces at the **[edit chassis synchronization]** hierarchy level as Synchronous Ethernet sources as needed.
2. Configure PTP options at the **[edit protocols ptp]** hierarchy level.
3. Configure hybrid mode options at the **[edit protocols ptp slave]** hierarchy level.

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode*. For step-by-step configuration of hybrid mode, see "Configuring Hybrid Mode and ESMC Quality Level Mapping" on page 335.

Configuration

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

CLI Quick Configuration

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

```
[edit]

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

Step-by-Step Procedure

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

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

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

2. Configure hybrid mode on the slave.

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

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

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

Results

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

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

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

CLI Quick Configuration

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

[edit]

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

Step-by-Step Procedure

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

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

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

2. Configure hybrid mode on the slave.

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

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

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

Results

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

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

```
        }
      }
    }
```

Verification

Verifying That the Router Is Operating in Hybrid Mode

Purpose Verify the current mode of operation of the slave.

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

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

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

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

Verifying the Quality Level Change on the Transmit Side

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Understanding Hybrid Mode on page 164
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133

CHAPTER 20

Configuring Chassis Settings to Support ATM Devices

Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode

On ATM2 IQ PICs only, you can configure Layer 2 circuit cell relay, Layer 2 circuit ATM Adaptation Layer 5 (AAL5), or Layer 2 circuit trunk mode.

Layer 2 circuit cell relay and Layer 2 circuit AAL5 are defined in the Internet draft draft-martini-l2circuit-encap-mpls-04.txt, *Encapsulation Methods for Transport of Layer 2 Frames Over IP and MPLS Networks*.

Layer 2 circuit trunk mode allows you to send ATM cells over Multiprotocol Label Switching (MPLS) trunking.

The four transport modes are defined as follows:

- To tunnel IP packets over an ATM backbone, use the default standard AAL5 transport mode.
- To tunnel a stream of AAL5-encoded ATM segmentation-and-reassembly protocol data units (SAR-PDUs) over an MPLS or IP backbone, use Layer 2 circuit AAL5 transport mode.
- To tunnel a stream of ATM cells over an MPLS or IP backbone, use Layer 2 circuit cell-relay transport mode.
- To transport ATM cells over an MPLS core network that is implemented on some other vendor switches, use Layer 2 circuit trunk mode.

NOTE: You can transport AAL5-encoded traffic with Layer 2 circuit cell-relay transport mode, because Layer 2 circuit cell-relay transport mode ignores the encoding of the cell data presented to the ingress interface.

When you configure AAL5 mode Layer 2 circuits, the control word carries cell loss priority (CLP) information by default.

By default, ATM2 IQ PICs are in standard AAL5 transport mode. Standard AAL5 allows multiple applications to tunnel the protocol data units of their Layer 2 protocols over an ATM virtual circuit. To configure the Layer 2 circuit transport modes, include the **atm-l2circuit-mode** statement at the **[edit chassis fpc *slot-number* pic *pic-number*]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
atm-l2circuit-mode (cell | aal5 | trunk trunk);
```

On a TX Matrix or TX Matrix Plus router, include the **atm-l2circuit-mode** statement at the **[edit chassis lcc *number* fpc *slot-number* pic *pic-number*]** hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number]
atm-l2circuit-mode (cell | aal5 | trunk trunk);
```

aal5 tunnels a stream of AAL5-encoded ATM cells over an IP backbone.

cell tunnels a stream of ATM cells over an IP backbone.

trunk transports ATM cells over an MPLS core network that is implemented on some other vendor switches. Trunk mode can be user-to-network interface (UNI) or network-to-network interface (NNI).

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

Related Documentation

- Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 280
- Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 346
- Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 275

Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices

ATM devices send idle cells to enable the receiving ATM interface to recognize the start of each new cell. The receiving ATM device does not act on the contents of idle cells and does not pass them up to the ATM layer in the ATM protocol stack.

By default, the idle cell format for ATM cells is (4 bytes): 0x00000000. For ATM 2 PICs and ATM MICs, you can configure the format of the idle cell header and payload bytes.

To configure the idle cell header to use the International Telecommunications Union (ITU-T) standard of 0x00000001, include the **itu-t** statement at the **[edit chassis fpc *slot-number* pic *number* idle-cell-format]** hierarchy level:

[edit chassis fpc *slot-number* pic *pic-number* idle-cell-format]
itu-t;

On a TX Matrix or TX Matrix Plus router, include the **itu-t** statement at the **[edit chassis lcc *number* fpc *slot-number* pic *pic-number* idle-cell-format]** hierarchy level:

[edit chassis lcc *number* fpc *slot-number* pic *pic-number* idle-cell-format]
itu-t;

By default, the payload pattern is cell payload (48 bytes). To configure the idle cell payload pattern, include the **payload-pattern statement** at the **[edit chassis fpc *slot-number* pic *pic-number* idle-cell-format]** hierarchy level:

[edit chassis fpc *slot-number* pic *pic-number* idle-cell-format]
payload-pattern *payload-pattern-byte*;

On a TX Matrix router, include the **payload-pattern** statement at the **[edit chassis lcc *number* fpc *slot-number* pic *pic-number* idle-cell-format]** hierarchy level:

[edit chassis lcc *number* fpc *slot-number* pic *pic-number* idle-cell-format]
payload-pattern *payload-pattern-byte*;

The payload pattern byte can range from **0x00** through **0xff**.

For information about the TX Matrix router, see “TX Matrix Router and T640 Router Configuration Overview” on page 173. For information about the TX Matrix Plus router, see “TX Matrix Plus Router Configuration Overview” on page 178.

Related Documentation

- Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 275
- Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 345
- Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 280

- *Configuring Layer 2 Circuit Transport Mode on ATM MICs*
- *Example: Configuring Layer 2 Circuit Transport Mode on ATM MICs*

CHAPTER 21

Configuring Chassis Settings for Routing Engines and Packet Forwarding Engines

Configuring the Junos OS to Support Redundancy on Routers Having Multiple Routing Engines or Switching Boards

For routers that have multiple Routing Engines or these multiple switching control boards: Switching and Forwarding Modules (SFMs), System and Switch Boards (SSBs), Forwarding Engine Boards (FEBs), or Compact Forwarding Engine Boards (CFEBs), you can configure redundancy properties.

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

```
redundancy {
  cfeb slot (always | preferred);
  failover {
    on-disk-failure
    on-loss-of-keepalives;
  }
  feb {
    redundancy-group group-name {
      feb slot-number (backup | primary);
      description description;
      no-auto-failover;
      }
    }
  graceful-switchover;
  keepalive-time seconds;
  routing-engine slot-number (master | backup | disabled);
  sfm slot-number (always | preferred);
  ssb slot-number (always | preferred);
}
```

Related Documentation

- *Understanding Routing Engine Redundancy on Juniper Networks Routers*

Signaling Neighboring Routers of Fabric Down on T640 and T1600 Routers

In JUNOS OS Release 10.4 and later, T640 and T1600 routers signal neighboring routers if they are unable to carry traffic due to all fabric planes being taken offline for one of the following reasons:

- CLI or button press initiated offline state.
- Automatically taken offline by the SPMB due to high temperature.
- PIO errors or voltage errors detected by the SPMB CPU to the SIBs.

The following scenarios are not supported:

- All PFEs get destination errors on all planes to all destinations, even with the Switch Interface Boards (SIBs) staying online.
- Complete fabric loss caused by destination timeouts, with the SIBs still online.

When chassisd detects all fabric planes are down, the router reboots all the FPCs in the system. When the FPCs come back up, the interfaces will not be created again, since all the fabric planes are down.

Once the user diagnoses and fixes the cause of all fabric planes going down, the user must then online the SIBs. The SIB online process brings up the interfaces.

Fabric down signaling to neighboring routers offers the following benefits:

- FPCs reboot when the control plane connection to the RE times out.

- Extends a simple approach to reboot FPCs when the dataplane blacks out.

When the router transitions from a state where SIBs are online or spare to a state where there are no SIBs in online state, then all the FPCs in the system are rebooted.

An ERRMSG indicates if all fabric planes are down and the FPCs will be rebooted if any fabric planes do not come up in 2 minutes.

An ERRMSG indicates the reason for FPC reboot on fabric connectivity loss.

The chassisd daemon traces when an FPC comes online, but PIC attach is not done due to no fabric plane present.

A warning is issued in the CLI when the last fabric plane is taken offline, that FPCs will reboot. You will need to online the SIBs after fixing the cause of the SIBs not being online. When the first SIB goes online, and link training with the FPCs completes, the interfaces will be created.

Fabric down signaling to neighboring routers functionality is available by default, and no user configuration required to enable it.

No CLI commands or alarms are required for this feature. Alarms indicate an SIBs offline system state to the user.

Related Documentation

- *Chassis-Level Feature Guide*

Traffic Black Hole Caused by Fabric Degradation

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

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

When the system detects unreachable Packet Forwarding Engine destinations, healing from a traffic black hole is attempted. If the healing fails, the system turns off the interfaces, thereby preventing a traffic black hole.

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

- Packet Forwarding Engine Errors and Recovery on PTX Series Routers on page 352
- Packet Forwarding Engine Errors and Recovery on T640, T1600 or TX Matrix Routers on page 352

Packet Forwarding Engine Errors and Recovery on PTX Series Routers

Packet Forwarding Engine destinations can become unreachable on PTX Series routers for the following reasons:

- The fabric Switch Interface Boards (SIBs) are offline as a result of a CLI command or a pressed physical button.
- The fabric SIBs are turned offline by the control board because of high temperature.
- Voltage or polled I/O errors in the SIBs are detected by the control board.
- Link errors occur on all connected planes.
- Two Packet Forwarding Engines can reach the fabric but not each other.
- Link errors occur where two Packet Forwarding Engines have connectivity with the fabric but not through a common plane.

Starting with Junos OS Release 13.3, you can use PTX Series routers to configure Packet Forwarding Engine (PFE)-related error levels and the actions to perform when a specified threshold is reached.

If error levels are not defined, a PTX Series router begins the following phases in the recovery process:

1. SIB restart phase: The router attempts to resolve the issue by restarting the SIBs one by one. This phase does not start if the SIBs are functioning properly and a single Flexible PIC Concentrator (FPC) is corrupt.
2. SIB and FPC restart phase: The router restarts both the SIBs and the FPCs. If there are corrupt FPCs that are unable to initiate high-speed links to the fabric after reboot, a traffic black hole cannot be created because no interfaces are created for these FPCs.
3. FPC offline phase: Because previous attempts at recovery failed, FPCs and interfaces are turned off and a traffic black hole is prevented.

Packet Forwarding Engine Errors and Recovery on T640, T1600 or TX Matrix Routers

Packet Forwarding Engine destinations can become unreachable on T640, T1600 or TX Matrix routers for the following reasons:

- The fabric Switch Interface Boards (SIBs) are offline as a result of a CLI command or a pressed physical button.
- The fabric SIBs are turned offline by the Switch Processor Mezzanine Board (SPMB) because of high temperature.
- Voltage or polled I/O errors in the SIBs are detected by the SPMB.
- All Packet Forwarding Engines receive destination errors on all planes from remote Packet Forwarding Engines, even when the SIBs are online.
- Complete fabric loss is caused by destination timeouts, even when the SIBs are online.

The recovery process consists of the following phases:

1. Fabric plane restart phase: The router restarts the fabric planes one by one. This phase does not start if the fabric plane is functioning properly and a single Flexible PIC Concentrator (FPC) is corrupt.
2. Fabric plane and FPC restart phase: The router restarts both the fabric planes and the FPCs. If there are corrupt FPCs that are unable to initiate high-speed links to the fabric after reboot, a traffic black hole cannot be created because no interfaces are created for these FPCs.
3. FPC offline phase: Because previous attempts at recovery failed, FPCs and interfaces are turned off and a traffic black hole is prevented.

Related Documentation

- Disabling FPC Restart on page 360
- Router Chassis Configuration Statements on page 454
- **degraded on page 479**
- **error on page 486**

Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers

A traffic black hole occurs when a router is unable to transmit data packets to other neighboring routers, although the interfaces on that router continue to be in the active state. As a result, the other neighboring routers continue to forward traffic to the impacted router, which drops the arriving packets without sending a notification to the other routers.

When a Packet Forwarding Engine in a router is unable to send traffic to other Packet Forwarding Engines over the data plane within the same router, the router is unable to transmit any packets to a neighboring router, although the interfaces are advertised as active on the control plane. Fabric failure can be one of the reasons for traffic black holes.

The following fabric failure scenarios can occur:

- Removal of the control board
- High-speed link 2 (HSL2) training failures
- Single link failure on an Flexible PIC Concentrator (FPC)
- Multiple link failures on the same FPC or the same fabric plane
- Multiple link failures randomly on an FPC or a fabric plane
- Intermittent cyclic redundancy check (CRC) errors
- A total traffic black hole for only one destination and not to other destinations

When an FPC does not forward traffic due to a certain reason to other FPCs within the device, the control protocol on the Routing Engine is unable to detect this condition. The traffic transmission is not diverted to the functional, active FPCs and, instead, the packets are continued to be sent to the affected FPC and are dropped at that point. The following might be the causes for an FPC being unable to forward traffic:

- All the planes in the system are in the**Offline** or **Fault** state.
- All the Packet Forwarding Engines on the DPC might have disabled the fabric streams due to destination errors.

If all the Switch Control Boards (SCBs) lose connectivity to the DPCs, then all the interfaces are brought down. If a Packet Forwarding Engine of a DPC loses complete connectivity to or from the fabric, then that DPC is brought down.

System hardware failures can be of the following types:

- A single occurrence or a rare failure for a brief period (such as environmental spikes). This failure is effectively healed without manual intervention by restarting the fabric plane and restarting the FPCs and the fabric plane, if necessary.
- Repeated failures that occur frequently.
- A permanent failure.

A recovery from any case of reduced throughput, such as multiple Packet Forwarding Engine destination timeouts on multiple planes is not attempted. Recovery from traffic black hole is attempted only when all the planes are in the **Offline** or **Fault** state or when the destinations are unreachable on all active planes.

If a black hole occurs because of a single bad FPC, which is either a common source or common destination of the destination timeout, if you the configured the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level, no recovery action is taken. The **show chassis fabric reachability** command output can be used to verify the status of the fabric and the FPC. An alarm is triggered to indicate that the particular FPC is causing a traffic black hole.

Fabric-Failure Detection Methods on MX Series Routers

The chassis daemon (chassisd) process detects the removal of a control board. The removal of the control board causes all the active planes that reside on that board to be disabled and a switchover is performed. If the active Routing Engine is also unplugged along with the control board, the detection of the control board removal is delayed until the switchover of the Routing Engine occurs and the reconnection in the primary, backup Routing Engine pair occurs. If the control board is turned offline by specifying the **request chassis cb slot *slot-number* offline** or a pressed physical button to cause a graceful shutdown, a fabric failure does not occur, even if the control board is moved to the offline state.

If active fabric planes are removed because of removal of the control board on the master RE, the DPC takes the local action of disabling removed planes. If spare planes are available, DPC initiates switchover to spare planes. If an active control board on a backup RE is removed, the master RE performs the switchover. The software attempts to optimize the duration of traffic black hole by disabling all removed planes. The spare planes are transitioned to the online state one by one.

Fabric self-ping is a mechanism to detect any issues in the fabric data path. Each Packet Forwarding Engine forwards fabric data cells that are destined to itself over all active fabric planes. To transmit the data cell, the Packet Forwarding Engine fabric sends the request cells over an active plane and waits for a grant packet. The destination Packet Forwarding Engine sends a grant packet over the same plane on which the request cell is received. When the grant cell is received, the source Packet Forwarding Engine sends the data cell.

The Packet Forwarding Engine fabric contains the capability to detect grant delays. If grants are not received within a certain period of time, a destination timeout is declared. Destination timeout on a certain plane by a Packet Forwarding Engine on two or more FPCs is considered as an indication for plane failures. Even if one Packet Forwarding Engine on an FPC flashes an error, the FPC is considered to be in error. Destination timeouts are noticed when the Packet Forwarding Engine sends traffic actively because requests are sent only for valid data cells. The software takes an appropriate action based on the destination timeout. For self-ping, a data cell is destined to the source Packet Forwarding Engine only.

Fabric ping failure messages are sent to the fabric manager on the Routing Engine, which collates all of the errors reported by all the Dense Port Concentrators (DPCs) and takes a corrective action. For example, a ping failure for all links of the same DPC might indicate a problem on the DPC. Ping failure for multiple DPCs for the same fabric plane might denote a problem with the fabric.

If the Routing Engine determines that a fabric plane is down, based on the information on errors it receives from the DPCs or the Packet Forwarding Engines, over a period of 5 seconds, it indicates a fabric failure. The duration of 5 seconds is the period for which the Routing Engine collates the errors from all of the DPCs.

Fabric self-ping packets are periodically sent to check the sanity of the fabric links. Self pings are sent at interval of 500 ms. The destination timeout is also checked in intervals of 500 ms. If two timeouts ocur successively, self ping failure is detected. When a destination timeout is received, the Packet Forwarding Engine fabric stops the sending of packets to the fabric. To examine the link condition again, the software resets the credits to ensure that new requests are sent again. When a self-ping failure occurs, the DPC removes the affected plane from sending data to all destinations. This method ensures that self-ping is not attempted to be sent again on the defective plane.

The following guidelines apply to the self-ping capability:

- By default, self pings are not sent on spare fabric planes because spare planes do not carry traffic.
- The size of self-ping packets is large enough to enable the cells to be loaded over all the active fabric planes (maximum of 8 for MX Series routers).
- A detection of received self-ping packets is not performed.
- High priority queue is used to enable self-ping to be sent for oversubscription cases.

Related Documentation

- Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 358

- Corrective Actions for Fabric Failures on MX Series Routers on page 356
- **redundancy-mode on page 561**
- **show chassis fabric redundancy-mode on page 1124**
- Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 361

Corrective Actions for Fabric Failures on MX Series Routers

This topic contains the following sections that describe different fabric failure scenarios, the detection methods used, and the corrective actions for the faults:

Traffic Black Hole Healing

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

- The control boards go offline as a result of a CLI command or a pressed physical button.
- The fabric control boards are turned offline because of high temperature.
- Voltage or polled I/O errors in the SIBs detected by the SPMB.
- All Packet Forwarding Engines receive destination errors on all planes from remote Packet Forwarding Engines, even when the SIBs are online.
- Complete fabric loss caused by destination timeouts, even when the SIBs are online.

When the system detects any unreachable Packet Forwarding Engine destinations, healing from a traffic black hole is attempted. If the healing fails, the system turns off the interfaces, thereby stopping the traffic black hole.

The recovery process consists of the following phases:

1. Fabric plane restart phase: Healing is attempted by restarting the fabric planes one by one. This phase does not start if the fabric plane is functioning properly and a single Flexible PIC Concentrator (FPC) is bad. An error message is generated to specify that a black hole is the reason for the fabric plane being turned offline. This phase is performed for fabric plane errors only.
2. Fabric plane and FPC restart phase: The system waits for the first phase to be completed before examining the system state again. If the black hole condition still persists after the first phase is performed or if the problem occurs again within a duration of 10 minutes, healing is attempted by restarting both the fabric planes and the FPCs. If you the configured the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level to disable restart of the FPCs when a recovery

is attempted, an alarm is triggered to indicate that a traffic black hole has occurred. In this second phase, three steps are taken:

1. All the FPCs that have destination errors on a PFE are turned offline
2. The fabric planes are turned offline and brought back online, one by one, starting with the spare plane.
3. The FPCs that were turned offline are brought back online.

3. FPC offline phase: The system waits for the second phase to be completed before examining the system state again. Traffic black hole is limited by turning the FPCs offline and by turning off interfaces because previous attempts at recovery have failed. If the problem is not resolved by restarting the FPCs or if the problem recurs within 10 minutes after restarting the FPCs, this phase is performed.

The three phases are controlled by timers. During these phases, if an event (such as offlining/onlining FPCs or fabric planes) times out, then the phase skips that event and proceeds to the next event. The timer control has a timeout value of 10 minutes. If the first fabric error occurs in a system with two or more FPCs, the fabric planes are restarted. If another fabric error occurs within the next 10 minutes, the fabric planes and FPCs are restarted. However, if the second fabric error occurs outside of the timeout period of 10 minutes, then the first phase is performed, which is the restart of only the fabric planes.

In cases where all the destination timeouts are traced to a bad FPC, for example, one source FPC or one destination FPC, only that FPC is turned offline and online. The fabric planes are not turned offline and online. If another fabric fault occurs within the period of 10 minutes, the FPC is turned offline.

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

FPCs with Degraded Fabric

You can configure an FPC with degraded fabric to be moved to the offline state. On an MX960, MX480, or MX240 router, you can configure link errors or bad fabric planes. This configuration is particularly useful in partial black hole scenarios where bringing the FPC offline results in faster re-routing. To configure this option on an FPC, use the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc *slot-number*]** hierarchy level. For more information, see "Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers" on page 358.

Complete Black Hole Towards a Single Destination Only

In certain deployments, an FPC indicates a complete black hole towards a single destination only, but it functions properly for other destinations. Such cases are identified and the affected FPC is recovered. Consider a sample scenario in which the active planes are 0,1,2,3 and the spare planes are 4,5,6,7 in the connection between FPC 0 and FPC1. If FPC 0 has single link failures for planes 0 and 1 and if FPC 1 has single link failures for planes 2 and 3, a complete black hole occurs between the two FPCs. Both FPC 0 and FPC 1 undergo a phased mode of recovery and fabric healing takes place.

Redundancy Fabric Mode on Active Control Boards

You can configure the active control board to be in redundancy mode or in increased fabric bandwidth mode. To configure redundancy mode for the active control board, use the **redundancy-mode redundant** statement at the **[edit chassis fabric]** hierarchy level. In redundancy mode, all the FPCs use 4 fabric planes as active planes, regardless of the type of the FPC. You can enable increased fabric bandwidth of active control boards for optimal and efficient performance and traffic handling. On an MX960, MX480, or MX240 router, you can use the **redundancy-mode increased-bandwidth** statement at the **[edit chassis fabric]** hierarchy level to enable increased fabric bandwidth mode for the active control board to cause all the available fabric planes to be used. In this mode, the maximum number of available fabric planes are used for MX routers and the MPC3E. On MX960 routers with active control boards, 6 active planes are used, and on MX240 and MX480 routers with active control boards, 8 active planes are used.

Increased fabric bandwidth mode is enabled by default on MX routers with Switch Control Board (SCB). On MX routers with Enhanced SCB—SCBE—and the MPC3E, redundancy mode is enabled by default. For more information, see "Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers" on page 361.

Related Documentation

- Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 358
- Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 353
- **redundancy-mode on page 561**
- **show chassis fabric redundancy-mode on page 1124**
- Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 361

Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers

You can configure an FPC with degraded fabric to be moved to the offline state on an MX960, MX480, or MX240 router. Configuring this feature does not affect the system. You can configure this feature without restarting the FPC or restarting the system.

The following scenarios can occur when you configure the feature to disable FPCs with degraded fabric:

- If an FPC has degraded fabric bandwidth and if you configure this capability to turn off such an FPC after it has been operating with degraded fabric for some time, the corrective action is still taken.
- If an FPC has been brought offline because of fabric errors and this functionality to move the FPC to offline state is disabled, the FPC is transitioned to the online state automatically.

- If an FPC has been brought offline because of fabric errors and this functionality to move the FPC to offline state is disabled or configured for some other FPC, the FPC that was turned offline is transitioned to the online state automatically.
- All the FPCs that were brought offline because of degraded fabric, when you configured this setting, are brought back online when you commit any configuration under the **[edit chassis]** hierarchy level. Similarly, a restart of the chassis daemon or the Graceful Routing Engine switchover (GRES) operation also causes the FPC that is disabled because of degraded fabric to be moved to the online state.

Degraded fabric indicates that an FPC is operating with less than the required number of active fabric planes. If an FPC is operating with less than four planes, it is considered to be degraded. This rule applies to all types of FPCs and fabric. Degraded condition denotes that good fabric traffic exists at a reduced bandwidth.

The following conditions can result in degradation of fabric:

- The fabric control boards go offline as a result of an unintentional, abrupt power shutdown.
- An application-specific integrated circuit (ASIC) error, which causes a plane of a control board to be automatically turned offline.
- Manually bringing the fabric plane or the control board to the offline state.
- Removal of the control board
- Self-ping failure on any plane.
- HSL2 training failure for active plane.
- If a spare fabric plane has CRC errors, and this spare plane is made online, the link with the CRC error is disabled. This mechanism might cause a degradation in fabric in one direction and might cause a traffic black hole in the other direction.
- When a self-ping or HSL2 training failure occurs, the fabric plane is disabled for a particular FPC and it is online for other FPCs. This condition can also cause a traffic black hole.

If you need to remove the control board or move a fabric plane to the offline state during a system maintenance, you must enable the functionality to turn the FPCs with degraded bandwidth to the offline state (by using the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc *slot-number*]** hierarchy level).

The following corrective actions are performed when a traffic black hole or fabric degradation occurs:

- Regardless of whether a spare control board is available or not, self-ping state for each FPC is monitored at intervals of 5 seconds at the Routing Engine. Fabric manager uses the following rule to determine the presence of a spare control board:
  - MX960 routers with I-chip or I-chip and Trio-chip-based FPCs that contain three control boards
  - MX240 or MX480 routers with I-chip or I-chip and Trio-chip-based FPCs that contain two control boards

  - MX960, MX480, or MX240 routers that contain only Trio-based FPCs are not considered to contain a spare control board

  If during any such interval of 5 seconds, two FPCs indicate a failure for the same plane, a switchover to the spare control board. In this case, the control board that reported errors is turned offline and the spare control board is turned online.

- If a spare control board is available, and if you configure the functionality to disable FPCs with degraded fabric, self-ping state for each FPC is monitored at intervals of 5 seconds at the Routing Engine. The following conditions can occur:
  - During any 5-second interval, if only one FPC indicates a failure for a plane, the fabric Manager waits for the next interval. During the subsequent interval, if no other FPC indicates a failure for the same plane, switchover of the control board is performed.
  - During any 5-second interval, if multiple FPCs show failures for multiple control boards, the fabric manager waits for the next interval. During the subsequent interval, if the same condition remains, all the failing FPCs are turned offline even if the spare control board is present.
  - During any 5-second interval, if any FPC shows a failure for multiple planes on multiple control boards, the fabric manager waits for the next interval. During the subsequent interval, if the same condition persists, the FPC is turned offline even if the spare control board is present.
- If spare planes are not available, the FPC is turned offline when it displays a failure for a single plane or multiple planes. The FPC is brought offline only if you previously configured the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc *slot-number*]** hierarchy level.

Related Documentation

- Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 353
- Corrective Actions for Fabric Failures on MX Series Routers on page 356
- **redundancy-mode on page 561**
- **show chassis fabric redundancy-mode on page 1124**

Disabling FPC Restart

You can disable FPC restart to limit recovery actions from a degraded fabric condition. On T640 and T1600 routers, only the fabric plane is restarted. On PTX Series routers, only the Switch Interface Boards (SIBs) are restarted. To disable the restarting of FPCs, use the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level:

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

Whenever FPC restart is disabled, an alarm is raised when there are unreachable destinations present in the router, and you must restart the FPCs manually.

To ensure that both the fabric planes (T640 and T1600 routers) or the SIBs (PTX Series routers) and the FPCs are restarted during the recovery process, do not configure the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level.

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- Router Chassis Configuration Statements on page 454

Disabling an FPC with Degraded Fabric Bandwidth

You can bring an FPC with degraded fabric bandwidth offline to avoid causing a traffic black hole in the chassis for an extended time. To configure the option to disable an FPC with degraded bandwidth, use the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc *slot-number*]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  offline-on-fabric-bandwidth-reduction;
}
```

The fabric manager checks the number of current active planes periodically. If the number of active planes is lower than the required number of active planes for a particular router, the system waits 10 seconds before it takes any corrective action. If the reduced bandwidth condition persists for an FPC and if this feature has been configured for the FPC, the system brings the FPC offline.

Related Documentation

- **offline-on-fabric-bandwidth-reduction on page 536**
- Traffic Black Hole Caused by Fabric Degradation on page 351
- Router Chassis Configuration Statements on page 454

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

You can configure the active control board to be in redundancy mode or in increased fabric bandwidth mode. You can enable increased fabric bandwidth of active control boards for optimal and efficient performance and traffic handling by configuring the active control boards to be in redundancy mode. To configure redundancy mode for the active control board, use the **redundancy-mode redundant** statement at the **[edit chassis fabric]** hierarchy level:

```
[edit chassis fabric]
redundancy-mode {
  redundant;
}
```

When you configure this option, all the FPCs use 4 fabric planes as active planes, regardless of the type of the FPC. If you do not configure this option, increased fabric bandwidth mode is enabled by default on MX routers.

To configure increased bandwidth mode for the active control board, use the **redundancy-mode increased-bandwidth** statement at the **[edit chassis fabric]** hierarchy level:

```
[edit chassis fabric]
redundancy-mode {
  increased-bandwidth;
}
```

In increased fabric bandwidth mode, MX Series routers will use 6 active planes. MX240 and MX480 routers will also use 2 spare planes in addition to the 6 active planes.

Increased fabric bandwidth mode is enabled by default on MX routers with Switch Control Board (SCB). On MX routers with Enhanced SCB—SCBE—and the MPC3E, redundancy mode is enabled by default.

Configuring this feature does not affect the system. You can configure this feature without restarting the FPC or restarting the system.

Related Documentation

- redundancy-mode on page 561
- show chassis fabric redundancy-mode on page 1124
- Router Chassis Configuration Statements on page 454

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

The jtree memory on all MX Series, all M120, and some M320, M10i, M7i, T640, T1600, TX Matrix, TX Matrix Plus router Packet Forwarding Engines has two segments: one segment primarily stores routing tables and related information, and the other segment primarily stores firewall-filter-related information.

The Junos OS provides the **memory-enhanced** statement to reallocate the jtree memory for routes, firewall filters, and Layer 3 VPNs. The statement has the following options:

- **filter**—Include this statement when you want to support larger firewall filters over routing tables. However, we recommend enabling this option only if you do not have a very large routing table configuration.

  To allocate more memory for firewall filters, include the **filter** statement at the **[edit chassis memory-enhanced]** hierarchy level:

  ```
  [edit chassis memory-enhanced]
  filter;
  ```

- **route**—Include this statement when you want to support larger routing tables (with more routes) over firewall filters. For example, you can enable this option, when you want to support a large number of routes for Layer 3 VPNs implemented using MPLS. However, we recommend enabling this option only if you do not have a very large firewall configuration.

  To allocate more memory for routing tables, include the **route** statement at the **[edit chassis memory-enhanced]** hierarchy level:


```
[edit chassis memory-enhanced]
route;
```

- **vpn-label**—Include this statement when you want to enhance memory to support a larger number of Layer 3 VPN labels.

  Layer 3 VPN composite next hops can be enabled by including the **l3vpn-composite-nexthop** statement at the **[edit routing-options]** and **[edit logical-systems *logical-system-name* routing-options]** hierarchy levels. This statement enables BGP to accept larger numbers of Layer 3 VPN BGP updates with unique inner VPN labels. Including the **l3vpn-composite-nexthop** in the configuration enhances scaling and convergence performance of PE routers participating in a Layer 3 VPN in a multivendor environment. For more information on configuring the **l3vpn-composite-nexthop** statement, see the *Junos OS VPNs Library for Routing Devices*.

  To allocate more memory to support a larger number of Layer 3 VPN labels accepted by the **l3vpn-composite-nexthop** statement, include the **vpn-label** statement at the **[edit chassis memory-enhanced]** hierarchy level:

  ```
  [edit chassis memory-enhanced]
  vpn-label;
  ```

  The **memory-enhanced vpn-label** statement increases the size of the fabric next-hop table, which is held on the egress FPC in the jtree, from the default value of 128,000 entries to 1,000,000 entries. This improves token fabric scaling, at the expense of additional segment 1 usage. This functionality is not applicable to MX Series, or M320 platforms, as these platforms provide for flexibly sized fabric token tables by default. This means that the **memory-enhanced route** statement is applicable to T Series platforms and that you can configure both **memory-enhanced vpn-label** and **memory-enhanced route** on T Series platforms when their combined functionality is desired.

You can configure the **memory-enhanced** statement on the following routers:

- M10i and M7i routers with Enhanced CFEB
- M320 routers with Enhanced III FPC1, Enhanced III FPC2, and Enhanced III FPC3
- M120 routers
- MX Series routers
- T Series (T640, T1600, TX Matrix, and TX Matrix Plus) routers with Enhanced Scaling FPC1, Enhanced Scaling FPC2, Enhanced Scaling FPC3, and Enhanced Scaling FPC4.

NOTE:

- The following hardware is not supported for the TXP-T1600 configuration for Junos OS Release 10.0 and earlier releases, If you plan to run a release prior to Junos OS Release 10.0, you must remove the following FPCs and any PICs that require these FPCs prior to integrating the LCC into the routing matrix:
  - All type 1 FPCs
  - All type 2 FPCs
  - T640 Enhanced Scaling FPC4-1P FPCs
- The following hardware is not supported for the TXP-T1600-3D or TXP-Mixed-LCC-3D configuration:
  - T640-FPC1-E and T640-FPC1-E2
  - T640-FPC2, T640-FPC2-E, and T640-FPC2-E2
  - T640-FPC3, T640-FPC3-E, and T640-FPC3-E2

As the allocation of more memory for routing tables or firewall filters might disrupt the forwarding operations of a Packet Forwarding Engine, the Junos OS CLI displays a warning to restart all affected FPCs when you commit a configuration that includes the **memory-enhanced route** statement. The configuration does not become effective until you restart the FPC or DPC (on MX Series routers).

To restart a single FPC or DPC without rebooting the entire router, issue the **request chassis fpc slot *slot-number* restart** command. On an M120 router, issue the **request chassis feb slot *slot-number* restart** command.

To view if the configuration is active on an FPC or DPC, issue the **show pfe fpc *slot-number*** command.

NOTE:

- For T Series routers only. With Junos OS Release 10.2, enhanced jtree memory allocation is disabled by default. For Junos OS Releases 9.3 through 10.1, the default routing tables (**inet.0** and **inet6.0**) use both memory segments by default.
- In Junos OS Release 11.2 and later, the **memory-enhanced route** statement at the **[edit chassis]** hierarchy level replaces the route-memory-enhanced statement at the **[edit chassis]** hierarchy level.
- The **filter** and **vpn-label** statements are supported only on T Series routers.

Related Documentation

- memory-enhanced on page 526
- filter on page 493

- route (chassis) on page 563
- vpn-label on page 601

- *Overview of a Routing Matrix with a TX Matrix Plus Router*

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

When a hard disk error occurs, a Routing Engine might enter a state in which it responds to local pings and interfaces remain up, but no other processes are responding.

To recover from this situation, you can configure a single Routing Engine to reboot automatically when a hard disk error occurs. To enable this feature, include the **on-disk-failure reboot** statement at the **[edit chassis routing-engine]** hierarchy level.

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

For dual Routing Engine environments, you can configure a backup Routing Engine to assume mastership automatically, if it detects a hard disk error on the master Routing Engine. To enable this feature, include the **on-disk-failure** statement at the **[edit chassis redundancy failover]** hierarchy level. For information about this statement, see the *Junos OS High Availability Library for Routing Devices*.

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

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

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

Related Documentation

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

Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC

The Junos OS enables you to configure sampling instances for active flow monitoring, by specifying a name for the sampling parameters and associating the instance name with a specific FPC, MPC, or DPC.

To configure active sampling instances, include the **instance** statement at the **[edit forwarding-options sampling]** hierarchy level. For more information about configuring sampling instances, see the *Junos OS Services Interfaces Library for Routing Devices*.

To associate a configured active sampling instance with a specific FPC, MPC, or DPC, include the sampling instance name at the **[edit chassis fpc *slot-number*]** hierarchy level:

[edit chassis fpc *slot-number*]
sampling-instance *instance-name*;

On a TX Matrix, TX Matrix Plus router, include the **sampling-instance** statement at the **[edit chassis lcc *number* fpc *slot-number*]** hierarchy level:

[edit chassis lcc *number* fpc *slot-number*]
sampling-instance *instance-name*;

Related Documentation

- *Junos Services Interfaces Configuration Guide*
- *Example: Sampling Instance Configuration*
- **sampling-instance on page 565**

Configuring a Policer Overhead

Configuring a policer overhead allows you to control the rate of traffic sent or received on an interface. When you configure a policer overhead, the configured policer overhead value (bytes) is added to the length of the final Ethernet frame. This calculated length of frame is used to determine the policer or the rate limit action. Therefore, the policer overhead enables you to control the rate of traffic sent or received on an interface. You can configure the policer overhead to rate-limit queues and Layer 2 and MAC policers. The policer overhead and the shaping overhead can be configured simultaneously on an interface.

This feature is supported on M Series and T Series routers with IQ2 PICs or IQ2E PICs, and on MX Series DPCs.

To configure a policer overhead for controlling the rate of traffic sent or received on an interface:

1. In the **[edit chassis]** hierarchy level in configuration mode, create the interface on which to add the policer overhead to input or output traffic.

   [edit chassis]
   user@host# **edit fpc *fpc* pic *pic***

   For example:

   [edit chassis]
   user@host# **edit fpc 0 pic 1**

2. Configure the policer overhead to control the input or output traffic on the interface. You could use either statement or both the statements for this configuration.

   [edit chassis fpc *fpc* pic *pic*]
   user@host# **set ingress-policer-overhead *bytes*;**
   user@host# **set egress-policer-overhead *bytes*;**

   For example:

   [edit chassis fpc 0 pic 1]

user@host# **set ingress-policer-overhead** 10;
user@host# **set egress-policer-overhead** 20;

3. Verify the configuration:

```
[edit chassis]
user@host# show
fpc 0 {
    pic 1 {
        ingress-policer-overhead 10;
        egress-policer-overhead 20;
    }
}
```

NOTE: When the configuration for the policer overhead bytes on a PIC is changed, the PIC goes offline and then comes back online. In addition, the configuration in the CLI is on a per-PIC basis and, therefore, applies to all the ports on the PIC.

Related Documentation

- egress-policer-overhead on page 484
- ingress-policer-overhead on page 509

Configuring Sanity Polling for FPCs on T Series Routers

T Series routers running Junos OS Release 11.4 and later support the sanity polling feature. You can configure the **sanity-poll** statement for a particular FPC to start a periodic sanity check for that FPC. The periodic sanity check includes checking for FPC error conditions such as “register sanity issues,” “high temperature,” “hardware failure,” and so on. If you do not configure the **sanity-poll** statement, then sanity polling is disabled.

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

Sanity polling periodically checks for an error condition in an FPC and performs the appropriate actions in case of an error.

To configure sanity polling for an FPC, include the **sanity-poll** statement and its substatements at the **[edit chassis fpc *slot-number*]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  sanity-poll {
    retry-count number;
    on-error {
      raise-alarm;
      power (cycle | off);
      write-coredump;
    }
```

```
    }
  }
```

NOTE: On a TX Matrix or TX Matrix Plus router, you can configure the **sanity-poll** statement at the **[edit chassis lcc *number* fpc *number*]** hierarchy level.

The **sanity-poll** statement comprises the following substatements:

- The **retry-count** statement specifies the number of rechecks to be performed after the occurrence of a particular error condition. If an error exists in all the periodic checks, then sanity polling reports an error and proceeds to perform the appropriate actions (described as options of the **on-error** statement).

  For example, if the periodic sanity check detects an error in the FPC and if you configure the **retry count** ***number*** to 15, sanity polling does not report the error immediately. Sanity polling checks 15 times for the same error condition. If an error persists in all 15 rechecks, then it reports an error and takes the appropriate actions.

  If you do not configure the **retry-count** statement, then by default, the **sanity-poll** statement rechecks the detected error 10 times before reporting an error condition.

- If sanity polling detects an error condition, the **on-error** statement performs the appropriate actions to eliminate the error.

  The following actions are common to all kinds of error conditions:

  - To generate a chassis alarm, configure the **raise-alarm** statement. The chassis alarm is displayed in the front panel of the chassis.
  - To reboot the FPC after generating a core file, configure the **power cycle** statement. This statement is useful for temporary software errors that are eliminated after reboot.
  - To halt the FPC, configure the **power off** statement. This statement is useful in case of permanent hardware failure.

    CAUTION: The **power off** statement halts the FPC. Ensure that you have backup paths through a different FPC to avoid service outage.

    NOTE: The **power cycle** and **power off** statements are mutually exclusive: You can configure either the **power cycle** or the **power off** action for an error.

  - To trigger the core file, configure the **write-coredump** statement.

You can configure multiple actions for a given FPC. If you do not configure any actions, the **sanity-poll** statement generates only FPC system log messages.

Related Documentation

- sanity-poll on page 566
- retry-count on page 562
- on-error on page 537

Configuring Slow Packet Forwarding Engine Alarm

On an M Series, an MX Series, or a T Series router, the Packet Forwarding Engine might not send a resource acknowledgment message to the Routing Engine within a predetermined time of 360 seconds. This delay in receiving resource acknowledgment could be due to a slow or stuck Packet Forwarding Engine on the M Series, MX Series, or T Series router, or on one of the LCCs connected to a TX Matrix, TX Matrix Plus, or TX Matrix Plus router with 3D SIBs.

Starting with Junos OS Release 13.2R1 (also applicable in Junos OS Releases 12.1R6, 12.2R5, 12.3R3, 13.1R2 and later), to display the issue as an alarm in the **show chassis alarms** command output and to append the alarm to the system log messages file, you must enable the slow Packet Forwarding Engine alarm on the router.

The following sections provide more information about the slow Packet Forwarding Engine alarm:

- Enabling Slow Packet Forwarding Engine Alarm on page 369
- Disabling Slow Packet Forwarding Engine Alarm on page 369
- Verifying That the Alarm Output and System Log Messages Are Updated on page 370

Enabling Slow Packet Forwarding Engine Alarm

To enable the slow Packet Forwarding Engine alarm, perform the following steps:

NOTE: **By default, the slow Packet Forwarding Engine alarm is disabled.**

1. In configuration mode, go to the **[edit chassis]** hierarchy level:

   [edit]
   user@host# **edit chassis**

2. Enable the slow Packet Forwarding Engine alarm by configuring the **slow-pfe-alarm** statement.

   [edit chassis]
   user@host# **set slow-pfe-alarm**

Disabling Slow Packet Forwarding Engine Alarm

To disable the slow Packet Forwarding Engine alarm, perform the following steps:

1. In configuration mode, go to the **[edit chassis]** hierarchy level:

   [edit]

user@host# **edit chassis**

2. Disable the slow Packet Forwarding Engine alarm by deleting the **slow-pfe-alarm** statement.

   [edit chassis]
   user@host# **delete slow-pfe-alarm**

Verifying That the Alarm Output and System Log Messages Are Updated

Purpose To verify that the output of the **show chassis alarms** operational mode command and the system log messages file are updated with the slow Packet Forwarding Engine alarm when:

- The **slow-pfe-alarm** statement is enabled in the **[edit chassis]** hierarchy.
- The Packet Forwarding Engine resource acknowledgment is not received by the Routing Engine within a predetermined time of 360 seconds.

Action To check the output on an M Series, MX Series, or a T Series router:

1. Verify that the alarm is displayed in the output of the **show chassis alarms** operational mode command.

```
user@host> show chassis alarms
1 alarms currently active
Alarm time               Class  Description
2013-02-05 01:12:33 PST  Minor  Potential slow peers are: XDPC2
```

   For field descriptions, see show chassis alarms.

2. Verify that the alarm is appended to the system log messages file.

```
/var/log/messages -
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: XDPC2
... Minor alarm set, Potential slow peers are: XDPC2
```

To check the output on a TX Matrix, TX Matrix Plus, or a TX Matrix Plus with 3D SIBs router:

1. Verify that the alarm is displayed in the output of the **show chassis alarms** operational mode command.

```
user@scc> show chassis alarms
scc-re0:
--------------------------------------------------------------------------
9 alarms currently active
Alarm time               Class  Description
2013-02-06 00:45:46 PST  Minor  Potential slow peers are: LCC1 LCC0
...
lcc0-re0:
--------------------------------------------------------------------------
4 alarms currently active
Alarm time               Class  Description
2013-02-06 00:44:51 PST  Minor  Potential slow peers are: GFPC4 GFPC3
...
lcc1-re0:
--------------------------------------------------------------------------
```



```
4 alarms currently active
Alarm time               Class  Description
2013-02-06 00:45:44 PST  Minor  Potential slow peers are: GFPC10
...
lcc2-re0:
--------------------------------------------------------------------------
No alarms currently active
lcc3-re0:
--------------------------------------------------------------------------
No alarms currently active
```

For field descriptions, see show chassis alarms.

2. Verify that the alarm is appended to the system log messages file.

```
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: LCC0 LCC1
... Minor alarm set, Potential slow peers are: LCC0
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: GFPC4 GFPC3
... Minor alarm set, Potential slow peers are: GFPC4 GFPC3
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: GFPC10
... Minor alarm set, Potential slow peers are: GFPC10
```

Meaning The output of **show chassis alarms** operational mode command and the system log messages file are updated as expected when the slow Packet Forwarding Engine alarm is enabled and when the Packet Forwarding Engine resource acknowledgment is not received by the Routing engine within a predetermined time of 360 seconds.

Related Documentation

- slow-pfe-alarm on page 571

CHAPTER 22

Configuring Chassis Settings for the Craft Interface

Configuring the Junos OS to Disable the Physical Operation of the Craft Interface

You can disable the physical operation of the craft interface front panel on the router. When you disable the operation of the craft interface, the buttons on the front panel, such as the alarm cutoff button, no longer function. To disable the craft interface operation, include the **craft-lockout** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
craft-lockout;
```

Related Documentation

- Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 379
- Silencing External Devices Connected to Alarm Relay Contacts on page 420

CHAPTER 23

Configuring Chassis Settings for PEMs

Configuring the Six-Input DC Power Supply

By default, the six-input DC power supply is configured to have all the six input feeds connected. You can also choose to provide four or five input feeds to the six-input DC power supply. When providing four or five input feeds on standalone routers, you need to configure the **feeds** statement at the **[edit chassis pem]** hierarchy level. When providing four or five input feeds to an LCC router in a routing matrix, you need to configure the **feeds** statement at the **[edit chassis lcc *lcc-number* pem]** hierarchy level.

Starting with Junos OS Release 12.3, the power management feature is enabled on T4000 routers with six-input DC power supply. The power management feature is enabled only when six input feeds with 40 amperes (A) each or four input feeds with 60 A each is configured on the router. To do this, you need to configure the **feeds** and **input-current** statements at the **[edit chassis pem]** hierarchy level.

NOTE:

- Before configuring input feeds for your router, see the *T640 Core Router Hardware Guide*, *T1600 Core Router Hardware Guide*, or *T4000 Core Router Hardware Guide* for special considerations and for the number of input feeds supported by the router.
- The value assigned to the **feeds** statement must be equal to the number of input feeds provided to the power supply. Else, an alarm message is generated to indicate the mismatch.

The following procedures describe how to configure the six-input DC power supply on different routers:

- Configuring the Six-Input DC Power Supply on an LCC Router in a Routing Matrix on page 376
- Configuring the Six-Input DC Power Supply on T640 and T1600 Routers on page 376
- Configuring the Six-Input DC Power Supply on T4000 Routers on page 377

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

To configure the six-input DC power supply on an LCC router in a routing matrix:

1. At the **[edit chassis lcc *lcc-number* pem]** hierarchy level, configure the **feeds** statement with the number of input feeds provided to the power supply.

   [edit chassis lcc *lcc-number* pem]
   user@host# **set feeds *number-of-input-feeds***

   For example:

   [edit chassis lcc 1 pem]
   user@host# **set feeds 5**

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

2. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis lcc 1 pem]
user@host# show
pem {
    feeds 5;
}
```

Configuring the Six-Input DC Power Supply on T640 and T1600 Routers

To configure the six-input DC power supply on a standalone T640 or T1600 router:

1. At the **[edit chassis pem]** hierarchy level, configure the **feeds** statement with the number of input feeds provided to the power supply.

   [edit chassis pem]
   user@host# **set feeds *number-of-input-feeds***

   For example:

   [edit chassis pem]
   user@host# **set feeds 5**

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

2. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
pem {
```



```
    feeds 5;
}
```

Configuring the Six-Input DC Power Supply on T4000 Routers

To configure the six-input DC power supply on a T4000 router:

1. At the **[edit chassis pem]** hierarchy level, configure the **feeds** statement with the number of input feeds provided to the power supply.

   [edit chassis pem]
   user@host# **set feeds** ***number-of-input-feeds***

   For example:

   [edit chassis pem]
   user@host# **set feeds 4**

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

2. Configure the input current received by the router.

   [edit chassis pem]
   user@host# **set input-current** ***amps-in-each-feed***

   For example, if the router receives 60 A of input current:

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

   NOTE: You can connect three 80 A DC power cables to six-input DC power supply by using terminal jumpers. When you do this, ensure that you set the value of the **feeds** statement to 6 and that of the **input current** statement to 40. If these configurations are not set, the power management feature is *not* enabled. For more information about the power management feature, see "T4000 Power Management Overview" on page 22.

3. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
pem {
    feeds 4;
    input-current 60;
}
```

Related Documentation

- T4000 Power Management Overview on page 22
- Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 263

- pem on page 544
- feeds on page 491
- input-current on page 510
- fru-poweron-sequence on page 502

- *Chassis Traps*

CHAPTER 24

Configuring Chassis Settings for Alarms

Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types

For the different types of PICs, you can configure which conditions trigger alarms and whether they trigger a red or yellow alarm. Red alarm conditions light the **RED ALARM** LED and trigger an audible alarm if one is connected. Yellow alarm conditions light the **YELLOW ALARM** LED and trigger an audible alarm if one is connected.

NOTE: By default, any failure condition on the integrated-services interface (Adaptive Services PIC) triggers a red alarm.

To configure conditions that trigger alarms and that can occur on any interface of the specified type, include the **alarm** statement at the **[edit chassis]** hierarchy level.

```
[edit chassis]
alarm {
  interface-type {
    alarm-name (red | yellow | ignore);
  }
}
```

alarm-name is the name of an alarm.

Related Documentation

- System-Wide Alarms and Alarms for Each Interface Type on page 380
- Chassis Conditions That Trigger Alarms on page 381
- Silencing External Devices Connected to Alarm Relay Contacts on page 420

System-Wide Alarms and Alarms for Each Interface Type

Table 25 on page 380 lists the system-wide alarms and the alarms for each interface type.

Table 25: 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 25: 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 379

Chassis Conditions That Trigger Alarms

Various conditions related to the chassis components trigger yellow and red alarms. You cannot configure these conditions.

- Backup Routing Engine Alarms on page 418
- For J Series Services Routers chassis component alarm conditions, see the *J Series Services Routers Hardware Guide*
- Chassis Component Alarm Conditions on M5 and M10 Routers on page 382
- Chassis Component Alarm Conditions on M7i and M10i Routers on page 385
- Chassis Component Alarm Conditions on M20 Routers on page 390

- Chassis Component Alarm Conditions on M40 Routers on page 393
- Chassis Component Alarm Conditions on M40e and M160 Routers on page 398
- Chassis Component Alarm Conditions on M120 Routers on page 403
- Chassis Component Alarm Conditions on M320 Routers on page 408
- Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers on page 413

- For PTX5000 Packet Transport Router chassis component alarm conditions, see the *PTX5000 Packet Transport Router Hardware Guide*
- For T320 Core Router chassis component alarm conditions, see the *T320 Core Router Hardware Guide*
- For T640 Core Router chassis component alarm conditions, see the *T640 Core Router Hardware Guide*
- For T1600 Core Router chassis component alarm conditions,sSee the *T1600 Core Router Hardware Guide*
- For T4000 Core Router chassis component alarm conditions, see the *T4000 Core Router Hardware Guide*
- For TX Matrix chassis component alarm conditions, see the *TX Matrix Router Hardware Guide*
- For TX Matrix Plus chassis component alarm conditions, see the *TX Matrix Plus Router Hardware Guide*

Chassis Component Alarm Conditions on M5 and M10 Routers

Table 26 on page 382 lists the alarms that the chassis components can generate on M5 and M10 routers.

Table 26: Chassis Component Alarm Conditions on M5 and M10 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at **www.juniper.net/** or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red

Table 26: Chassis Component Alarm Conditions on M5 and M10 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace failed fan tray.	Red
Forwarding Engine Board (FEB)	The control board has failed. If this occurs, the board attempts to reboot.	Replace failed FEB.	Red
Flexible PIC Concentrator (FPC)	An FPC has failed. If this occurs, the FPC attempts to reboot. If the FEB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red

Table 26: Chassis Component Alarm Conditions on M5 and M10 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	The Ethernet management interface (**fxp0** or **em0**) on the Routing Engine is down.	• Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	Red
Power supplies	A power supply has been removed from the chassis.	Install missing power supply.	Yellow
	A power supply has failed.	Replace failed power supply.	Red

Table 26: Chassis Component Alarm Conditions on M5 and M10 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at **www.juniper.net/** or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M7i and M10i Routers

Table 27 on page 386 lists the alarms that the chassis components can generate on M7i and M10i routers.

Table 27: Chassis Component Alarm Conditions on M7i and M10i Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Compact FEB (CFEB)	For an M7i router, CFEB has failed. If this occurs, the board attempts to reboot.	Replace failed CFEB.	Red
	For an M10i router, both control boards have been removed or have failed.	Replace failed or missing CFEB.	Red
	Too many hard errors in CFEB memory.	Replace failed CFEB.	Red
	Too many soft errors in CFEB memory.	Replace failed CFEB.	Red
	A CFEB microcode download has failed.	Replace failed CFEB.	Red
Fan trays	A fan has failed.	Replace failed fan tray.	Red
	For an M7i router, a fan tray has been removed from the chassis.	Install missing fan tray.	Red
	For an M10i router, both fan trays are absent from the chassis.	Install missing fan tray.	Red
	For a TX Matrix Plus router, fan tray is not matching the ST-SIB-Ls SIB.	Install a Rev.3 fan tray.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's midplane from the front is broken.	Replace failed component.	Red

Table 27: Chassis Component Alarm Conditions on M7i and M10i Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Power supplies	A power supply has been removed.	Insert missing power supply.	Yellow
	A power supply has failed.	Replace failed power supply.	Red
	For an M10i router, only one power supply is operating.	Insert or replace secondary power supply.	Red

Table 27: Chassis Component Alarm Conditions on M7i and M10i Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	Yellow
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk. This alarm only applies, if you have an optional CompactFlash card.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface (**fxp0** or **em0**) on the Routing Engine is down.		Red

Table 27: Chassis Component Alarm Conditions on M7i and M10i Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M20 Routers

Table 28 on page 390 lists the alarms that the chassis components can generate on M20 routers.

Table 28: 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 28: Chassis Component Alarm Conditions on M20 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	Yellow
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	The Ethernet management interface (**fxp0** or **em0**) on the Routing Engine is down.		Red

Table 28: Chassis Component Alarm Conditions on M20 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has failed.	Replace failed power supply.	Red
SSB	The control board has failed. If this occurs, the board attempts to reboot.	Replace failed control board.	Red

Table 28: Chassis Component Alarm Conditions on M20 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M40 Routers

Table 29 on page 393 lists the alarms that the chassis components can generate on M40 routers.

Table 29: Chassis Component Alarm Conditions on M40 Routers

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

Table 29: Chassis Component Alarm Conditions on M40 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace fan tray.	Red
FPC	An FPC has an out of range or invalid temperature reading.	Replace failed FPC.	Yellow
	An FPC microcode download has failed.	Replace failed FPC.	Red
	An FPC has failed. If this occurs, the FPC attempts to reboot. If the SCB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
	Too many hard errors in FPC memory.	Replace failed FPC.	Red
	Too many soft errors in FPC memory.	Replace failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red

Table 29: 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 29: Chassis Component Alarm Conditions on M40 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	Yellow
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface (**fxp0** or **em0**) on the Routing Engine is down.		Red

Table 29: Chassis Component Alarm Conditions on M40 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	
SCB	The System Control Board (SCB) has failed. If this occurs, the board attempts to reboot.	Replace failed SCB.	Red

Table 29: Chassis Component Alarm Conditions on M40 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M40e and M160 Routers

Table 30 on page 399 lists the alarms that the chassis components can generate on M40e and M160 routers.

Table 30: 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 30: 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 30: Chassis Component Alarm Conditions on M40e and M160 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	Yellow
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface (**fxp0** or **em0**) on the Routing Engine is down.		Red

Table 30: Chassis Component Alarm Conditions on M40e and M160 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has failed.	Replace failed power supply.	Red
Switching and Forwarding Module (SFM)	An SFM has an out of range or invalid temperature reading on SPP.	Replace failed SFM.	Yellow
	An SFM has an out of range or invalid temperature reading on SPR.	Replace failed SFM.	Yellow
	An SFM is offline.	Set SFM online.	Yellow
	An SFM has failed.	Replace failed SFM.	Red
	An SFM has been removed from the chassis.	Insert SFM into empty slot.	Red
	All SFMs are offline or missing from the chassis.	Insert SFMs into empty slots or set all SFMs online.	Red

Table 30: Chassis Component Alarm Conditions on M40e and M160 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M120 Routers

Table 31 on page 403 lists the alarms that the chassis components can generate on M120 routers.

Table 31: Chassis Component Alarm Conditions on M120 Routers

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

Table 31: 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 31: 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 31: Chassis Component Alarm Conditions on M120 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	Yellow
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface (**fxp0** or **em0**) on the Routing Engine is down.		Red

Table 31: Chassis Component Alarm Conditions on M120 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	

Table 31: Chassis Component Alarm Conditions on M120 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	Chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at **http://www.juniper.net/support/** or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M320 Routers

Table 32 on page 409 lists the alarms that the chassis components can generate on M320 routers.

Table 32: 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 32: 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 32: Chassis Component Alarm Conditions on M320 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	Yellow
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	A spare SIB is missing.	Insert spare SIB in to empty slot.	Yellow
	The Ethernet management interface (**fxp0** or **em0**) on the Routing Engine is down.		Red

Table 32: Chassis Component Alarm Conditions on M320 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	
Switch Interface Board (SIB)	A SIB has failed.	Replace failed SIB.	Yellow
	A spare SIB has failed.	Replace failed SIB.	Yellow
	A SIB has an out of range or invalid temperature reading.	Replace failed SIB.	Yellow
	A SIB is missing.	Insert SIB into empty slot.	Red
	A SIB has failed.	Replace failed SIB.	Red
	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow

Table 32: Chassis Component Alarm Conditions on M320 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	Chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers

Table 33 on page 413 lists the alarms that the chassis components can generate on MX Series 3D Universal Edge routers.

Table 33: 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 33: 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 33: 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 33: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	Yellow
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface (**fxp0** or **em0**) on the Routing Engine is down.		Red

Table 33: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	
System Control Board (SCB)	An SCB has been removed.	Insert SCB into empty slot.	Yellow
	An SCB temperature sensor alarm has failed.	Replace failed SCB.	Yellow
	An SCB has failed.	Replace failed SCB.	Red

Table 33: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	Chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at **http://www.juniper.net/support/** or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Backup Routing Engine Alarms

For routers with master and backup Routing Engines, a master Routing Engine can generate alarms for events that occur on a backup Routing Engine. Table 34 on page 419 lists chassis alarms generated for a backup Routing Engine.

NOTE: Because the failure occurs on the backup Routing Engine, alarm severity for some events (such as Ethernet interface failures) is yellow instead of red.

NOTE: For information about configuring redundant Routing Engines, see the *Junos OS High Availability Library for Routing Devices*.

Table 34: Backup Routing Engine Alarms

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The backup Routing Engine boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Boot Device	The boot device (CompactFlash or hard disk) is missing in boot list on the backup Routing Engine.	Replace failed backup Routing Engine.	Red
Ethernet	The Ethernet management interface (**fxp0** or **em0**) on the backup Routing Engine is down.	• Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	Yellow
FRU Offline	The backup Routing Engine has stopped communicating with the master Routing Engine.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Hard Disk	Error in reading or writing hard disk on the backup Routing Engine.	Reformat hard disk and install bootable image. If this fails, replace failed backup Routing Engine.	Yellow

Table 34: Backup Routing Engine Alarms *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Multibit Memory ECC	The backup Routing Engine reports a multibit ECC error.	• Reboot the system with the board reset button on the backup Routing Engine. • If the alarm recurs, open a support case using the Case Manager link at **www.juniper.net/support/** or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	Yellow

Related Documentation

- Silencing External Devices Connected to Alarm Relay Contacts on page 420

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 379
- Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 373

CHAPTER 25

Examples

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

The following examples show how to configure symmetrical hashing at the PIC level for load balancing on MX Series routers:

Configuring Symmetrical Hashing for family multiservice on Both Routers

On the inbound traffic interface where traffic enters Router A, include the **symmetric-hash** statement at the **[edit chassis fpc *slot-number* pic *pic-number* hash-key family multiservice]** hierarchy level:

```
[edit chassis fpc 2 pic 2 hash-key]
family multiservice {
  source-mac;
  destination-mac;
  payload {
    ip {
      layer-3;
      layer-4;
```

```
    }
  }
  symmetric-hash;
}
```

On the inbound traffic interface where traffic enters Router B, include the **symmetric-hash complement** statement at the **[edit chassis fpc *slot-number* pic *pic-number* hash-key family multiservice]** hierarchy level:

```
[edit chassis fpc 0 pic 3 hash-key]
family multiservice {
  source-mac;
  destination-mac;
  payload {
    ip {
      layer-3;
      layer-4;
    }
  }
  symmetric-hash {
    complement;
  }
}
```

Configuring Symmetrical Hashing for family inet on Both Routers

On the inbound traffic interface where traffic enters Router A, include the **symmetric-hash** statement at the **[edit chassis fpc *slot-number* pic *pic-number* hash-key family inet]** hierarchy level:

```
[edit chassis fpc 0 pic 1 hash-key]
family inet {
  layer-3;
  layer-4;
  symmetric-hash;
}
```

On the inbound traffic interface where traffic enters Router B, include the **symmetric-hash complement** statement at the **[edit chassis fpc *slot-number* pic *pic-number* hash-key family inet]** hierarchy level:

```
[edit chassis fpc 1 pic 2 hash-key]
family inet {
  layer-3;
  layer-4;
  symmetric-hash {
    complement;
  }
}
```

Configuring Symmetrical Hashing for family inet and family multiservice on the Two Routers

On the inbound traffic interface where traffic enters Router A, include the **symmetric-hash** statement at the **[edit chassis fpc *slot-number* pic *pic-number* hash-key family multiservice]** hierarchy level:

```
[edit chassis fpc 1 pic 0 hash-key]
family multiservice {
  payload {
    ip {
      layer-3;
      layer-4;
    }
  }
  symmetric-hash;
}
```

On the inbound traffic interface where traffic enters Router B, include the **symmetric-hash complement** statement at the **[edit chassis fpc *slot-number* pic *pic-number* hash-key family inet]** hierarchy level:

```
[edit chassis fpc 0 pic 3 hash-key]
family inet {
  layer-3;
  layer-4;
  symmetric-hash {
    complement;
  }
}
```

Related Documentation

- Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 237

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.

The bandwidth that you specify determines the port number of the tunnel interfaces that are created. When you specify a bandwidth of **1g**, the port number is always 10. When you specify any other bandwidth, the port number is always 0.

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

Related Documentation

- Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 280
- Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 424
- Example: Configuring Tunnel Interfaces on the MPC3E on page 424
- **bandwidth (Tunnel Services) on page 467**
- **tunnel-services (Chassis) on page 597**

- *[edit chassis] Hierarchy Level*

Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC

In this example, you create tunnel interfaces on Packet Forwarding Engine 0 of DPC 4 with 10 Gbps of bandwidth reserved for tunnel traffic. Ethernet and tunnel interfaces cannot coexist on the same Packet Forwarding Engine of a 10-Gigabit Ethernet 4-port DPC. With this configuration, the tunnel interfaces created are **gr-4/0/0**, **pe-4/0/0**, **pd-4/0/0**, **vt-4/0/0** and so on.

The bandwidth that you specify determines the port number of the tunnel interfaces that are created. When you specify a bandwidth of **1g**, the port number is always 10. When you specify any other bandwidth, the port number is always 0.

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

Related Documentation

- Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 423
- Example: Configuring Tunnel Interfaces on the MPC3E on page 424
- **bandwidth (Tunnel Services) on page 467**
- **tunnel-services (Chassis) on page 597**

- *[edit chassis] Hierarchy Level*

Example: Configuring Tunnel Interfaces on the MPC3E

Requirements for Configuration of Tunnel Interfaces on the MPC3E

This example requires MX Series routers with the MPC3E.

Ethernet Tunnel Configuration Overview

MX Series routers do not support Tunnel Services PICs. However, you can create one set of tunnel interfaces per pic slot up to a maximum of 4 slots from 0-3 on MX Series routers with the MPC3E.

To configure the tunnels, include the **tunnel-services** statement and an optional bandwidth of (**1g | 10g | 20g | 30g | 40g**) at the **[edit chassis]** hierarchy level.

The bandwidth that you specify determines the port number of the tunnel interfaces that are created. When you specify a bandwidth of **1g**, the port number is always 10. When you specify any other bandwidth, the port number is always 0.

NOTE: When no tunnel bandwidth is specified, the tunnel interface can have a maximum bandwidth of up to 60Gbps.

NOTE: A MIC need not be plugged in to the MPC3E to configure a tunnel interface.

Configuring a 20-Gigabit Ethernet Tunnel

Step-by-Step Procedure

In the following example, you create tunnel interfaces on PIC-slot 1 of MPC 0 with 20 gigabit per second of bandwidth reserved for tunnel traffic. With this configuration, the tunnel interfaces created are **gr-0/1/0**, **pe-0/1/0**, **pd-0/1/0**, **vt-0/1/0**, and so on.

1. To create a 20 gigabit per second tunnel interface, use the following configuration:

```
[edit chassis]
fpc 0 pic 1 {
  tunnel-services {
    bandwidth 20g;
  }
}
```

Configuring a Tunnel With Unspecified Bandwidth

Step-by-Step Procedure

In the following example, you create a tunnel interface on PIC-slot 3 of MPC 0 with no bandwidth specified. The tunnel traffic can carry up to a maximum of 60Gbps depending on other traffic through the packet forwarding engine. With this configuration, the tunnel interfaces created are **gr-0/3/0**, **pe-0/3/0**, **pd-0/3/0**, **vt-0/3/0**, and so on.

1. To create a tunnel interface with no bandwidth specification, use the following configuration:

```
[edit chassis]
fpc 0 pic 3 {
  tunnel-services;
}
```

Related Documentation

- Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 423
- Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 424
- **bandwidth (Tunnel Services) on page 467**
- **tunnel-services (Chassis) on page 597**

- *[edit chassis] Hierarchy Level*
- *Configuring Tunnel Interfaces on MX Series Routers*

Example: Configuring Fabric Redundancy Mode on MPC4E

Requirements for Configuration of the Fabric Redundancy Mode on MPC4E

This example uses the following hardware and software components:

- Junos OS Release 12.3 R2 or later for MX Series routers
- A single MX480 router with MPC4E

Overview

This example provides information about configuring the fabric redundancy mode on an MX480 router with MPC4E. You can configure the MPC4E to function in redundant fabric mode or increased bandwidth mode. If you do not configure the mode, the MPC4E, by default, functions in redundant fabric mode. In redundant fabric mode, the number of active fabric planes is 4. If you configure the MPC4E to function in increased bandwidth mode, the number of active fabric planes increases to 6.

Configuring Increased Bandwidth Mode

Step-by-Step Procedure

In this example, you configure increased bandwidth mode on an MX480 router with MPC4E. The existing fabric mode on the MX480 router is redundant fabric mode. To configure the fabric mode, perform the following tasks:

1. Verify the existing fabric mode of the router by using the **show chassis fabric mode** command.

```
user@host > show chassis fabric mode
Fabric Operating Mode :
           Redundant Fabric
```

2. View the number of active fabric planes by using the **show chassis fabric summary** command.

```
user@host > show chassis fabric summary
Plane   State    Uptime
 0      Online   2 hours, 58 minutes, 22 seconds
 1      Online   6 seconds
 2      Online   32 seconds
 3      Online   2 hours, 58 minutes, 23 seconds
 4      Spare    31 seconds
 5      Spare    21 seconds
 6      Spare    18 seconds
 7      Spare    9 seconds
 Note:
 For FPC slots with MPC Type 4 or MCC:
   Fabric planes 1 and 5, 3 and 7 use shared physical links.
   Those slots may run in a reduced bandwidth in case both
   plane 1 and 5, or both 3 and 7 are active.
```


3. In configuration mode, go to the **[edit chassis]** hierarchy level and set the fabric mode to **increased-bandwidth** as follows:

   [edit chassis]
   user@ host #**set fabric redundancy-mode increased-bandwidth**

Results In **redundant fabric** mode, the number of active fabric planes is 4 while the number of spare planes is also 4. In **increased-bandwidth** mode, the number of active planes is 6 while the number of spare planes is 2.

NOTE: **Fabric planes 1 and 5 and fabric planes 3 and 7 use shared physical links. So, among fabric planes 1 and 5, only one plane can be active. Similarly, among fabric planes 3 and 7, only one plane can be active.**

Verification

To verify that the fabric mode of the MX480 router with MPC4E, perform the following tasks:

- Verifying the Fabric Redundancy Mode of the Router on page 427
- Verifying the Number of Active Fabric Planes on page 427

Verifying the Fabric Redundancy Mode of the Router

Purpose To verify that the fabric redundancy mode of the MX480 router with MPC4E has been modified to **increased-bandwidth**.

Action To view the fabric mode of the router, use the **show chassis fabric mode** command.

```
user@host > show chassis fabric mode
Fabric redundancy mode: Increased Bandwidth
```

Meaning The MX480 router with MPC4E is functioning in increased bandwidth mode.

Verifying the Number of Active Fabric Planes

Purpose To verify that the number of active fabric planes is 6.

Action To view the number of active fabric planes, use the **show chassis fabric summary** command.

```
user@host > show chassis fabric summary
Plane   State    Uptime
 0      Online   2 hours, 55 minutes, 49 seconds
 1      Online   2 hours, 55 minutes, 25 seconds
 2      Online   2 hours, 58 minutes, 48 seconds
 3      Online   2 hours, 55 minutes, 50 seconds
 4      Online   2 hours, 55 minutes, 48 seconds
 5      Spare    2 hours, 55 minutes, 40 seconds
 6      Online   2 hours, 55 minutes, 37 seconds
 7      Spare    2 hours, 55 minutes, 29 seconds
 Note:
 For FPC slots with MPC Type 4 or MCC:
   Fabric planes 1 and 5, 3 and 7 use shared physical links.
   Those slots may run in a reduced bandwidth in case both
   plane 1 and 5, or both 3 and 7 are active.
```

Meaning Number of active planes on the MX480 router with MPC4E is 6 (0, 1, 2, 3, 4, and 6) while the number of spare planes is 2.

Related Documentation

- Fabric Management on MPC4E Overview on page 21
- **show chassis fabric destinations on page 1005**
- **show chassis fabric fpcs on page 1021**
- **show chassis fabric plane on page 1077**
- **show chassis fabric summary on page 1143**

Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board

These examples show how to configure the following clock sources and features on an Enhanced MX Switch Control Board (SCBE): Synchronous Ethernet, ordinary Precision Time Protocol (PTP) slave, hybrid PTP slave, and retiming through the building-integrated timing supply (BITS) external interface.

Requirements

These examples use the following hardware and software components:

- One MX240, MX480, or MX960 router with MPC 16x10GE or MPC2Es (see *MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 Routers*) for Synchronous Ethernet clock sources, or MPC2E-P for PTP clock sources
- One Synchronous Ethernet clock source device (may be an MX240, MX480, or MX960 router)
- One PTP grandmaster device
- One BITS device (may be the same as the PTP grandmaster device)
- Junos OS Release 12.2 or later for MX240, MX480, or MX960 routers
- Junos OS Release 12.3 or later to configure a BITS interface as an input, output, or I/O clock source for MX240, MX480, or MX960 routers

Before you begin configuring centralized clocking on an interface that uses Synchronous Ethernet, ensure that you have configured the MX Series interface as a chassis synchronization source to the device that provides a Synchronous Ethernet clock source.

- Configure the MX Series interface as a chassis synchronization source to the device that provides a Synchronous Ethernet clock source.

Overview

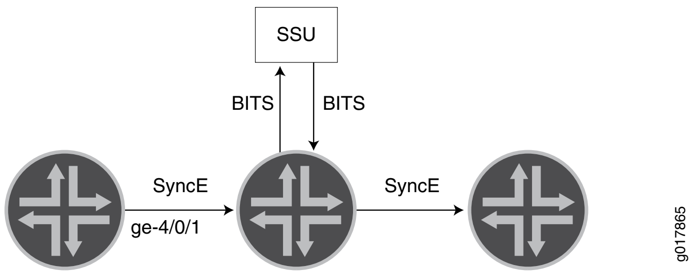
With the addition of a Stratum 3 clock module to the SCBE, an MX240, MX480, or MX960 chassis can perform clock monitoring, filtering, and holdover in a centralized chassis location. Chassis line cards can be configured to recover network timing clocks at the physical layer via Synchronous Ethernet or by a packet-based PTP implementation. These recovered clocks are routed to the SCBE Stratum 3 clock module via the chassis backplane. A clock selection algorithm is run that selects the best quality recovered clock from the list of configured clock sources. The Stratum 3 clock module locks to the selected clock source and fans it out to the chassis line cards. 16x10GE 3D and MPC2Es (see *MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 Routers*) can distribute this clock to downstream network elements via Synchronous Ethernet.

The Stratum 3 clock module acquires holdover data while locked to the selected clock source. If the clock fails, the Stratum 3 clock module enters holdover mode and replays collected holdover data to maintain its output clock. The Stratum 3 holdover performance depends on the drift of the SCBE OCXO device.

In Junos 12.3, support was added for synchronizing an MX240, MX480, or MX960 chassis with an SCBE to a BITS timing source through an RJ-48 port on the SCBE. The BITS external clock interface supports the sending and receiving of Synchronization Status Message (SSM) quality levels. The quality level is used by the chassis clock-selection algorithm. When BITS output is configured, the source-mode default is the selected line clock source.

The BITS external interface can be connected to a retiming device, which cleans up the clock and sends it back in the external BITS interface. The conditioned input BITS clock is selected as the chassis clock and distributed downstream via Synchronous Ethernet interfaces. The **tx-dnu-to-line-source-enable** option is used to prevent a timing loop. Figure 4 on page 430 shows the BITS retiming functionality using a Synchronization Supply Unit (SSU). For instructions on how to configure retiming through the BITS external interface, see "Configuring Retiming through the BITS External Interface" on page 432.

Figure 4: BITS Retiming with Synchronization Supply Unit (SSU)



Prior to the SCBE, clock monitoring, filtering, and holdover functions were distributed throughout the chassis and performed on MPC2E line cards. This distributed clocking mode limits the distribution of timing to downstream network elements on MPC2E interfaces only. Centralized clocking mode removes this limitation by supporting the distribution of timing on MPC 16x 10GE line interfaces as well.

Configuration

To configure centralized clocking, perform one or more of these tasks:

- Configuring Centralized Clocking from a Synchronous Ethernet Clock Source on page 430
- Configuring Centralized Clocking from an Ordinary PTP Clock Source on page 431
- Configuring Centralized Clocking from a Hybrid PTP Clock Source on page 431
- Configuring Retiming through the BITS External Interface on page 432

Configuring Centralized Clocking from a Synchronous Ethernet Clock Source

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set chassis synchronization network-option option-2
set chassis synchronization source interfaces ge-4/1/0 priority 1
set chassis synchronization source interfaces ge-4/1/0 quality-level st3
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a Synchronous Ethernet clock source:

1. Configure the network option:

[edit chassis synchronization]
user@host# **set network-option option-2**

2. Configure the priority and quality level of the clock source on this interface:

   [edit chassis synchronization source interfaces ge-4/1/0]
   user@host# **set priority 1**
   user@host# **set quality-level st3**

Results

From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
source {
     interfaces ge-4/1/0 {
          priority 1;
          quality-level st3;
     }
}
```

After you configure the device, enter **commit** from configuration mode.

Configuring Centralized Clocking from an Ordinary PTP Clock Source

Step-by-Step Procedure

To configure a PTP clock source:

1. Configure ordinary mode PTP on the ge-4/1/9 interface to the PTP grandmaster device. See “Example: Configuring Precision Time Protocol” on page 331.

Configuring Centralized Clocking from a Hybrid PTP Clock Source

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

set chassis synchronization network-option option-2
set chassis synchronization source interfaces ge-4/1/0 priority 1
set chassis synchronization source interfaces ge-4/1/0 quality-level st3

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a hybrid PTP clock source:

1. Configure the network option:

   [edit chassis synchronization]
   user@host# **set network-option option-2**

2. Configure the priority and quality level of the clock source on this interface:

[edit chassis synchronization source interfaces ge-4/1/0]
user@host# **set priority 1**
user@host# **set quality-level st3**

3. Configure hybrid mode PTP on the ge-4/1/9 interface to the PTP grandmaster device. For the **synchronous-ethernet-mapping** interface, specify the Synchronous Ethernet interface used in Step 2.

Results From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
source {
     interfaces ge-4/1/0 {
          priority 1;
          quality-level st3;
     }
}
```

After you configure the device, enter **commit** from configuration mode.

Configuring Retiming through the BITS External Interface

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

set chassis synchronization network-option option-2
set chassis synchronization interfaces external signal-type t1
set chassis synchronization interfaces external t1-options line-encoding b8zs
set chassis synchronization interfaces external t1-options framing sf
set chassis synchronization output interfaces external wander-filter-disable
set chassis synchronization output interfaces external holdover-mode-disable
set chassis synchronization output interfaces external source-mode line
set chassis synchronization output interfaces external tx-dnu-to-line-source-enable
set chassis synchronization output interfaces external minimum-quality st3
set chassis synchronization source interfaces ge-4/0/1 quality-level st3
set chassis synchronization source interfaces external quality-level prs

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure retiming through the BITS external interface using an SSU:

1. Configure the network option (G.812 type IV clock):

   [edit chassis synchronization]
   user@host# **set network-option option-2**

2. Configure the external BITS signal type (T1-coded 1.544-MHz signal on 100-ohm balanced line):

[edit chassis synchronization interfaces external]
set signal-type t1

3. Configure the external BITS signal line-encoding (B8ZS) and framing (superframe) options:

   [edit chassis synchronization interfaces external]
   user@host# **set t1-options line-encoding b8zs**
   user@host# **set t1-options framing sf**

4. Configure the output external BITS signal properties:

   - Disable wander filtering:

     [edit chassis synchronization output interfaces external]
     user@host# **set wander-filter-disable**

   - Disable holdover:

     [edit chassis synchronization output interfaces external]
     user@host# **set holdover-mode-disable**

   - Select the best line clock source for output:

     [edit chassis synchronization output interfaces external]
     user@host# **set source-mode line**

   - Set Tx QL to DNU/DUS on the line source interface to prevent a timing loop:

     [edit chassis synchronization output interfaces external]
     user@host# **set tx-dnu-to-line-source-enable**

   - Set minimum quality level:

     [edit chassis synchronization output interfaces external]
     user@host# **set minimum-quality st3**

5. Configure the incoming clock source and quality level:

   [edit chassis synchronization source interfaces ge-4/0/1]
   user@host# **set quality-level st3**

6. Configure the external clock source and quality level:

   [edit chassis synchronization source interfaces external]
   user@host# **set quality-level prs**

Results From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
interfaces external {
    signal-type t1;
    t1-options {
        line-encoding b8zs;
        framing sf;
    }
}
output {
    interfaces external {
```

```
        wander-filter-disable;
        holdover-mode-disable;
        source-mode line;
        tx-dnu-to-line-source-enable;
        minimum-quality st3;
    }
}
source {
    interfaces ge-4/0/1 {
        quality-level st3;
    }
    interfaces external {
        quality-level prs;
    }
}
```

After you configure the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying the Synchronous Ethernet Clock Source

Purpose Verify that the MX Series router recovers, selects, qualifies, and locks to the configured Synchronous Ethernet clock source.

Action From operational mode, enter the **show chassis synchronization clock-module** command.

user@host> **show chassis synchronization clock-module**

```
Clock module on SCB0
  Current role      : master
  Current state     : locked to ge-4/1/0
    State for       : 0 days, 00 hrs, 00 mins, 15 secs
    State since     : Mon Jun  6 07:28:47 2011
  Monitored clock sources
    Interface       Type         Status
    ge-4/1/0        syncE        qualified-selected
```

Meaning The Monitored clock sources field shows that the ge-4/1/0 interface has the Synchronous Ethernet type and is the qualified and selected centralized clock source.

Verifying the Ordinary PTP Clock Source

Purpose Verify that the MX Series router recovers, selects, qualifies, and locks to the configured PTP clock source.

Action From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role     : master
  Current state    : locked to ge-4/1/9
    State for      : 0 days, 00 hrs, 00 mins, 45 secs
    State since    : Wed Jun 29 10:52:05 2011
  Monitored clock sources
    Interface      Type         Status
    ge-4/1/9       ptp          qualified-selected
```

Meaning The Monitored clock sources field shows that the ge-4/1/9 interface has the ptp type and is the qualified and selected centralized clock source.

Verifying the Hybrid PTP Clock Source

Purpose Verify that the MX Series router recovers, selects, qualifies, and locks to the configured hybrid PTP clock source.

Action From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role     : master
  Current state    : locked to ge-4/1/9
    State for      : 0 days, 00 hrs, 00 mins, 15 secs
    State since    : Wed Jun 29 11:19:25 2011
  Monitored clock sources
    Interface      Type         Status
    ge-4/1/9       ptp-hybrid   qualified-selected

Configured sources:

Interface           : ge-4/1/0
Status              : Primary       Index       : 218
Clock source state  : Clk qualified Priority    : 1
Configured QL       : ST3           ESMC QL     : DUS
Clock source type   : ifd           Clock Event : Clock locked
Kernel flags        : Up,sec,
```

Meaning The Monitored clock sources field shows that the ge-4/1/9 interface has the ptp-hybrid type and is the qualified and selected centralized clock source. The Configured sources field shows that the ge-4/1/0 interface has the Clock locked Clock Event .

Verifying the Retiming through the BITS External Interface

Purpose Verify that the MX Series router recovers, selects, qualifies, and locks to the configured clock source, and that the external clock is locked to the configured clock source.

Action From operational mode, enter the **show chassis synchronization extensive** command.

```
user@host> show chassis synchronization extensive
```

```
Current clock status  : Locked
Clock locked to       : Primary

Configured interfaces:

Name         : external
Signal type  : t1 (sf b8zs)
Rx status    : active
Tx status    : active
LED color    : green

Configured outputs:

Interface      : external
Tx status      : active
Minimum QL     : ST3            Tx QL         : ST3
Holdover mode  : disabled       Wander filter : disabled
Source mode    : line           Source Tx DNU : enabled
Holdover data  : valid
Current state  : locked to ge-4/0/1
  State for    : 0 days, 00 hrs, 24 mins, 47 secs
  State since  : Thu Sep  6 13:01:07 2012

Configured sources:

Interface           : external
Status              : Primary       Index       : 0
Clock source state  : Clk qualified Priority    : Default(6)
Configured QL       : PRS           ESMC QL     : PRS
Clock source type   : extern        Clock Event : Clock locked
Interface State     : Up,pri,

Interface           : ge-4/0/1
Status              : Secondary     Index       : 152
Clock source state  : Clk qualified Priority    : Default(8)
Configured QL       : ST3           ESMC QL     : DUS
Clock source type   : ifd           Clock Event : Clock qualified
Interface State     : Up,sec,ESMC TX(QL DUS/SSM 0xf),
```

Meaning The Configured interfaces field shows that the external interface receive and transmit statuses are active. The Configured outputs field shows that the current state is locked to ge-4/0/1. The Configured sources field shows that the external interface is the qualified and selected centralized clock source, and has the Clock locked Clock Event. The Configured sources field shows that the ge-4/0/1 interface is the secondary clock source, and has the Clock qualified Clock Event.

Related Documentation

- synchronization on page 581
- show chassis synchronization (MX Series Routers) on page 1550
- Example: Configuring Precision Time Protocol on page 331
- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Precision Time Protocol Overview on page 143

Example: Configuring Centralized Clocking on an MX2020

These examples show how to configure the following clock sources and features on an MX2020 router: Synchronous Ethernet, Precision Time Protocol (PTP) slave, hybrid PTP slave, and retiming through the building-integrated timing supply (BITS) external interface.

Requirements

These examples use the following hardware and software components:

- One MX2020, with MPC 16x10GE or MPC2Es (see *MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 Routers*) for Synchronous Ethernet clock sources, or MPC2E-P for PTP clock sources
- One Synchronous Ethernet clock source device
- One PTP grandmaster device
- One BITS device (may be the same as the PTP grandmaster device)
- Junos OS Release 13.3 for MX2020 routers
- Junos OS Release 13.3 or later to configure a BITS interface as an input, output, or I/O clock source for MX2020 router
- Configure the MX Series interface as a chassis synchronization source to the device that provides a Synchronous Ethernet clock source.

Overview

With the addition of a Stratum 3 (ST3) clock module the MX2020 chassis can perform clock monitoring, filtering, and holdover in a centralized chassis location. Chassis line cards can be configured to recover network timing clocks at the physical layer via Synchronous Ethernet or by a packet-based PTP implementation. These recovered clocks are routed to MX2020 SCB ST3 clock module via the chassis backplane. A clock selection algorithm is run that selects the best quality recovered clock from the list of configured clock sources. The ST3 clock module locks to the selected clock source and fans it out to the chassis line cards. 16x10GE 3D and MPC2Es (see *MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 Routers*) can distribute this clock to downstream network elements via Synchronous Ethernet.

The ST3 clock module acquires holdover data while locked to the selected clock source. If the clock fails, the ST3 clock module enters holdover mode and replays collected holdover data to maintain its output clock. The ST3 holdover performance depends on the drift of the MX SCB OCXO device.

In Junos 13.3, support was added for synchronizing an MX2020 chassis to a BITS timing source using any of the two BITS interfaces. The quality level is used by the chassis clock-selection algorithm. When BITS output is configured, the source-mode can be configured as either **chassis** or **line**.

The BITS external interface can be connected to a retiming device, which cleans up the clock and sends it back in the external BITS interface. The conditioned input BITS clock is selected as the chassis clock and distributed downstream via Synchronous Ethernet interfaces. The **tx-dnu-to-line-source-enable** option is used to prevent a timing loop. For instructions on how to configure retiming through the BITS external interface, see "Configuring Retiming through the BITS External Interface" on page 432.

Prior to 13.3, clock monitoring, filtering, and holdover functions were distributed throughout the chassis and performed on MPC2E line cards. This distributed clocking mode limits the distribution of timing to downstream network elements on MPC2E interfaces only. Centralized clocking mode removes this limitation by supporting the distribution of timing on MPC 16x 10GE line interfaces as well.

Configuration

To configure centralized clocking, perform one or more of these tasks:

Configuring Centralized Clocking from a Synchronous Ethernet Clock Source

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set chassis synchronization network-option option-2
set chassis synchronization source interfaces ge-4/1/0 priority 1
set chassis synchronization source interfaces ge-4/1/0 quality-level st3
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a Synchronous Ethernet clock source:

1. Configure the network option:

   ```
   [edit chassis synchronization]
   user@host# set network-option option-2
   ```

2. Configure the priority and quality level of the clock source on this interface:

   ```
   [edit chassis synchronization source interfaces ge-4/1/0]
   ```

```
user@host# set priority 1
user@host# set quality-level st3
```

Results

From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
source {
     interfaces ge-4/1/0 {
          priority 1;
          quality-level st3;
     }
}
```

After you configure the device, enter **commit** from configuration mode.

Configuring an ordinary PTP Clock Source

Step-by-Step Procedure

To configure a PTP clock source:

1. Configure ordinary mode PTP on the ge-4/1/9 interface to the PTP grandmaster device. See "Example: Configuring Precision Time Protocol" on page 331.

Configuring Centralized Clocking from a Hybrid Mode PTP Clock Source

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set chassis synchronization network-option option-2
set chassis synchronization source interfaces ge-4/1/0 priority 1
set chassis synchronization source interfaces ge-4/1/0 quality-level st3
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a hybrid mode PTP clock source:

1. Configure the network option:

   ```
   [edit chassis synchronization]
   user@host# set network-option option-2
   ```

2. Configure the priority and quality level of the clock source on this interface:

   ```
   [edit chassis synchronization source interfaces ge-4/1/0]
   user@host# set priority 1
   user@host# set quality-level st3
   ```

3. To configure hybrid mode PTP on the ge-4/1/9 interface to the PTP grandmaster device, see "Configuring Hybrid Mode PTP" on page 440.

Results

From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
source {
     interfaces ge-4/1/0 {
          priority 1;
          quality-level st3;
     }
}
```

After you configure the device, enter **commit** from configuration mode.

Configuring Hybrid Mode PTP

CLI Quick Configuration

To quickly configure hybrid mode on the ge-4/1/0 interface with the clock source IP address as 2.2.2.2, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

[edit]

set protocols ptp slave hybrid
set protocols ptp slave hybrid synchronous-ethernet-mapping
set protocols ptp slave hybrid synchronous-ethernet-mapping clock-source 2.2.2.2 interface ge-4/1/0
set protocols ptp slave convert-clock-class-to-quality-level

Step-by-Step Procedure

To configure hybrid mode on an MX240 router with mapping of the PTP clock class perform the following steps:

1. Configure the **convert-clock-class-to-quality-level** option on the slave at the **[edit protocols ptp slave]** hierarchy level.

   ```
   [edit protocols ptp slave]
   user@host# set convert-clock-class-to-quality-level
   ```

2. Configure hybrid mode on the slave.

   ```
   [edit protocols ptp slave]
   user@host# edit hybrid
   ```

3. Configure the Synchronous Ethernet mapping option, IP address of the master clock as 2.2.2.2, and the interface ge-4/1/0 for hybrid mode on the slave.

   ```
   [edit protocols ptp slave hybrid]
   user@host# set synchronous-ethernet-mapping clock-source 2.2.2.2 interface
     ge-4/1/0
   ```

Results

Display the results of the configuration of hybrid mode with the mapping of the PTP clock class to the ESMC quality level:

```
[edit protocols ptp slave]
user@host# show
```



```
convert-clock-class-to-quality-level
hybrid {
  synchronous-ethernet-mapping {
    clock-source 2.2.2.2 {
    interface ge-4/1/0;
    }
  }
}
```

Configuring Retiming through the BITS External Interface

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set chassis synchronization network-option option-2
set chassis synchronization interfaces external signal-type t1
set chassis synchronization interfaces external t1-options line-encoding b8zs
set chassis synchronization interfaces external t1-options framing sf
set chassis synchronization output interfaces external wander-filter-disable
set chassis synchronization output interfaces external holdover-mode-disable
set chassis synchronization output interfaces external source-mode line
set chassis synchronization output interfaces external tx-dnu-to-line-source-enable
set chassis synchronization output interfaces external minimum-quality st3
set chassis synchronization source interfaces ge-4/0/1 quality-level st3
set chassis synchronization source interfaces external quality-level prs
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure retiming through the BITS external interface using an SSU:

1. Configure the network option (G.812 type IV clock):

   ```
   [edit chassis synchronization]
   user@host# set network-option option-2
   ```

2. Configure the external BITS signal type (T1-coded 1.544-MHz signal on 100-ohm balanced line):

   ```
   [edit chassis synchronization interfaces external]
   set signal-type t1
   ```

3. Configure the external BITS signal line-encoding (B8ZS) and framing (superframe) options:

   ```
   [edit chassis synchronization interfaces external]
   user@host# set t1-options line-encoding b8zs
   user@host# set t1-options framing sf
   ```

4. Configure the output external BITS signal properties:

   - Disable wander filtering:

     ```
     [edit chassis synchronization output interfaces external]
     ```


user@host# **set wander-filter-disable**

- Disable holdover:

  [edit chassis synchronization output interfaces external]
  user@host# **set holdover-mode-disable**

- Select the best line clock source for output:

  [edit chassis synchronization output interfaces external]
  user@host# **set source-mode line**

- Set Tx QL to DNU/DUS on the line source interface to prevent a timing loop:

  [edit chassis synchronization output interfaces external]
  user@host# **set tx-dnu-to-line-source-enable**

- Set minimum quality level:

  [edit chassis synchronization output interfaces external]
  user@host# **set minimum-quality st3**

5. Configure the incoming clock source and quality level:

   [edit chassis synchronization source interfaces ge-4/0/1]
   user@host# **set quality-level st3**

6. Configure the external clock source and quality level:

   [edit chassis synchronization source interfaces external]
   user@host# **set quality-level prs**

Results From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
interfaces external {
    signal-type t1;
    t1-options {
        line-encoding b8zs;
        framing sf;
    }
}
output {
    interfaces external {
        wander-filter-disable;
        holdover-mode-disable;
        source-mode line;
        tx-dnu-to-line-source-enable;
        minimum-quality st3;
    }
}
source {
    interfaces ge-4/0/1 {
        quality-level st3;
    }
    interfaces external {
        quality-level prs;
```



```
    }
}
```

After you configure the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying the Synchronous Ethernet Clock Source on page 443
- Verifying the Ordinary PTP Clock Source on page 443
- Verifying the Hybrid PTP Clock Source on page 444
- Verifying the Retiming through the BITS External Interface on page 444

Verifying the Synchronous Ethernet Clock Source

Purpose Verify that the MX Series router recovers, selects, qualifies, and locks to the configured Synchronous Ethernet clock source.

Action From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role     : master
  Current state    : locked to ge-4/1/0
    State for      : 0 days, 00 hrs, 00 mins, 15 secs
    State since    : Mon Jun  6 07:28:47 2011
  Monitored clock sources
    Interface      Type         Status
    ge-4/1/0       syncE        qualified-selected
```

Meaning The Monitored clock sources field shows that the ge-4/1/0 interface has the Synchronous Ethernet type and is the qualified and selected centralized clock source.

Verifying the Ordinary PTP Clock Source

Purpose Verify that the MX Series router recovers, selects, qualifies, and locks to the configured PTP clock source.

Action From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role     : master
  Current state    : locked to ge-4/1/9
    State for      : 0 days, 00 hrs, 00 mins, 45 secs
    State since    : Wed Jun 29 10:52:05 2011
  Monitored clock sources
    Interface      Type         Status
    ge-4/1/9       ptp          qualified-selected
```

Meaning The Monitored clock sources field shows that the ge-4/1/9 interface has the ptp type and is the qualified and selected centralized clock source.

Verifying the Hybrid PTP Clock Source

Purpose Verify that the MX Series router recovers, selects, qualifies, and locks to the configured hybrid PTP clock source.

Action From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role      : master
  Current state     : locked to ge-4/1/9
    State for       : 0 days, 00 hrs, 00 mins, 15 secs
    State since     : Wed Jun 29 11:19:25 2011
  Monitored clock sources
    Interface       Type         Status
    ge-4/1/9        ptp-hybrid   qualified-selected

Configured sources:

Interface          : ge-4/1/0
Status             : Primary       Index       : 218
Clock source state : Clk qualified Priority    : 1
Configured QL      : ST3           ESMC QL     : DUS
Clock source type  : ifd           Clock Event : Clock locked
Kernel flags       : Up,sec,
```

Meaning The Monitored clock sources field shows that the ge-4/1/9 interface has the ptp-hybrid type and is the qualified and selected centralized clock source. The Configured sources field shows that the ge-4/1/0 interface has the Clock locked Clock Event .

Verifying the Retiming through the BITS External Interface

Purpose Verify that the MX Series router recovers, selects, qualifies, and locks to the configured clock source, and that the external clock is locked to the configured clock source.

Action From operational mode, enter the **show chassis synchronization extensive** command.

```
user@host> show chassis synchronization extensive

Current clock status  : Locked
Clock locked to       : Primary

Configured interfaces:

Name          : external
Signal type   : t1 (sf b8zs)
Rx status     : active
Tx status     : active
LED color     : green

Configured outputs:
```



```
Interface      : external
Tx status      : active
Minimum QL     : ST3              Tx QL         : ST3
Holdover mode  : disabled         Wander filter : disabled
Source mode    : line             Source Tx DNU : enabled
Holdover data  : valid
Current state  : locked to ge-4/0/1
  State for    : 0 days, 00 hrs, 24 mins, 47 secs
  State since  : Thu Sep  6 13:01:07 2012

Configured sources:

Interface           : external
Status              : Primary       Index       : 0
Clock source state  : Clk qualified Priority    : Default(6)
Configured QL       : PRS           ESMC QL     : PRS
Clock source type   : extern        Clock Event : Clock locked
Interface State     : Up,pri,

Interface           : ge-4/0/1
Status              : Secondary     Index       : 152
Clock source state  : Clk qualified Priority    : Default(8)
Configured QL       : ST3           ESMC QL     : DUS
Clock source type   : ifd           Clock Event : Clock qualified
Interface State     : Up,sec,ESMC TX(QL DUS/SSM 0xf),
```

Meaning The Configured interfaces field shows that the external interface receive and transmit statuses are active. The Configured outputs field shows that the current state is locked to ge-4/0/1. The Configured sources field shows that the external interface is the qualified and selected centralized clock source, and has the Clock locked Clock Event. The Configured sources field shows that the ge-4/0/1 interface is the secondary clock source, and has the Clock qualified Clock Event.

Related Documentation

- **synchronization on page 581**
- **show chassis synchronization (MX Series Routers) on page 1550**
- Example: Configuring Precision Time Protocol on page 331
- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Precision Time Protocol Overview on page 143

Example: Configuring a T4000 Chassis to Represent a T640 Chassis

This example shows how to configure OSS mapping feature to represent a T4000 chassis as a T640 chassis. You can extend this concept to configure a T4000 chassis to represent as a T1600 chassis as well.

- Requirements on page 446
- Overview on page 446
- Configuring the T4000 Chassis to Represent a T640 Chassis on page 446
- Verification on page 447

Requirements

This example uses the following hardware and software components:

- One T4000 router
- Junos OS Release 12.3R3, 13.1R2, 13.2R1, or later

Overview

Operations support systems (OSS) is used by service providers to maintain their networks. When a new router is added or removed from the network, the OSS must be updated to reflect the changes. This process is tedious and time-consuming.

When a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis, the OSS identifies the new chassis as a new networking element and follows a tedious process of qualifying it for the customer's network. The *OSS mapping feature* helps avoid this scenario.

Using the OSS mapping feature, you can map a T4000 chassis to a T1600 chassis or to a T640 chassis with the **set chassis oss-map model-name t640|t1600** configuration command. This configuration command overrides the chassis model name, so that the OSS recognizes the chassis as a known chassis and proceeds without any requalification.

NOTE:

- The **set chassis oss-map model-name t640 | t1600** command is applicable only on T4000 routers. You must explicitly set this command when a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis.
- You can execute the **set chassis oss-map model-name t640** command or the **set chassis oss-map model-name t1600** command, if the OSS is compatible with either the T640 chassis or the T1600 chassis, respectively.

Configuring the T4000 Chassis to Represent a T640 Chassis

Step-by-Step Procedure

To configure the T4000 chassis to represent a T640 chassis by using the OSS mapping feature:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

   ```
   [edit]
   user@T4000# edit chassis
   ```

2. Configure the OSS mapping feature to map the T4000 chassis to a T640 chassis.

   ```
   [edit chassis]
   user@T4000# set oss-map model-name t640
   ```

Verification

Verifying the OSS Mapping Feature

Purpose To verify that the OSS mapping feature is working on a T4000 router.

Action Run the show chassis operational command and verify that the configured known chassis name is displayed when the T4000 chassis is mapped to a T640 chassis.

- Run the **show chassis hardware** operational command:

```
user@T4000> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN11B3892AHA      T640
Midplane          REV 01   710-027486   RC9848            T-series Backplane
FPM GBUS          REV 13   710-002901   BBAG5143          T640 FPM Board
FPM Display       REV 04   710-021387   BBAL2705          T1600 FPM Display
CIP               REV 06   710-002895   BBAL3705          T-series CIP
PEM 1             REV 03   740-036442   VJ00054           Power Entry Module
6x60
SCG 0            REV 18   710-003423   BBAJ0727          T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAE3887          T640 Sonet Clock Gen.
Routing Engine 0 REV 06   740-026941   P737F-002705      RE-DUO-1800
Routing Engine 1 REV 06   740-026941   P737F-002675      RE-DUO-1800
CB 0              REV 09   710-022597   EF7371            LCC Control Board
....
```

- Run the **show chassis hardware detail** operational command:

```
user@T4000> show chassis hardware detail
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN11B3892AHA      T640
Midplane          REV 01   710-027486   RC9848            T-series Backplane
FPM GBUS          REV 13   710-002901   BBAG5143          T640 FPM Board
FPM Display       REV 04   710-021387   BBAL2705          T1600 FPM Display
CIP               REV 06   710-002895   BBAL3705          T-series CIP
PEM 1             REV 03   740-036442   VJ00054           Power Entry Module
6x60
SCG 0            REV 18   710-003423   BBAJ0727          T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAE3887          T640 Sonet Clock Gen.
Routing Engine 0 REV 06   740-026941   P737F-002705      RE-DUO-1800
  ad0     3823 MB  SMART CF             201101050335CCFACCFA Compact Flash
  ad1    62720 MB  SMART Lite SATA Drive 2011021700D8789F789F Disk 1
Routing Engine 1 REV 06   740-026941   P737F-002675      RE-DUO-1800
  ad0     3823 MB  SMART CF             201011150208AF59AF59 Compact Flash
  ad1    62720 MB  SMART Lite SATA Drive 2010122700A160026002 Disk 1
CB 0              REV 09   710-022597   EF7371            LCC Control Board
....
```

- Run the **show chassis hardware extensive** operational command:

```
user@T4000> show chassis hardware extensive
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN11B3892AHA      T640
Jedec Code:    0x7fb0             EEPROM Version:    0x02
                                   S/N:               JN11B3892AHA
Assembly ID:   0x0507             Assembly Version:  00.00
```

```
Date:          00-00-0000        Assembly Flags:    0x00
....
```

Verifying the OSS Mapping Feature on SNMP MIBs

Purpose To verify that the SNMP MIBs are updated with the configured known chassis name.

Action Run the **show snmp mib** operational commands and verify that the configured known chassis name is displayed in SNMP MIBs when the T4000 chassis is mapped to a T640 chassis:

- Run the **show snmp mib walk system** operational command:

```
user@T4000> show snmp mib walk system
sysDescr.0    = Juniper Networks, Inc. t640 internet router, kernel JUNOS
12.3-...Juniper Networks, Inc.
sysObjectID.0 = jnxProductNameT640
...
```

- Run the **show snmp mib walk jnxBoxAnatomy** operational command:

```
user@T4000> show snmp mib walk jnxBoxAnatomy
jnxBoxClass.0 = jnxProductLineT640.0
jnxBoxDescr.0 = Juniper t640 Internet Backbone Router
jnxBoxSerialNo.0 = JN11B3892AHA
jnxBoxRevision.0
....
```

Meaning On configuring the OSS mapping feature, the OSS maps the T4000 chassis to a T640 chassis, thereby preventing requalification of the new chassis.

Related Documentation

- Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 264
- oss-map on page 539
- show chassis oss-map on page 1447
- Understanding Operations Support Systems Mapping on page 26

CHAPTER 26

Configuration Statements

- vtmapping on page 603
- wander-filter-disable on page 603

Router Chassis Configuration Statements

You can configure properties of the router chassis, including conditions that activate the red and yellow alarm LEDs and SONET/SDH framing and concatenation properties for individual Physical Interface Cards (PICs).

To configure router chassis properties, include the following statements at the **[edit chassis]** hierarchy level:

NOTE: Statements at the **[edit chassis redundancy]** hierarchy level are described in the *Junos OS High Availability Library for Routing Devices*.

```
chassis {
  aggregated-devices {
    ethernet {
      device-count number;
      lacp {
        system-priority;
        link-protection;
      }
    }
    sonet {
      device-count number;
    }
  }
  alarm {
    interface-type {
      alarm-name (red | yellow | ignore);
    }
  }
  config-button {
    no-clear;
    no-rescue;
    craft-lockout;
  }
  fabric {
    degraded {
      action-fpc-restart-disable;
      degraded-fabric-detection-enable
      degraded-fpc-bad-plane-threshold number-bad-planes;
      }
    redundancy-mode (increased-bandwidth | redundant);
  }
  feb
    slot number
      ucode-imem-remap
    {
  }
  fpc slot-number {
```



```
allow-sram-parity-errors;
offline-on-fabric-bandwidth-reduction
port-mirror-instance port-mirroring-instance-name;
sampling-instance;
route-localization {
  fib-local;
  fib-remote;
}
power (off | on);
pic pic-number {
  port-mirror-instance port-mirroring-instance-name;
  framing (t1 | e1);
  port port-number {
    forwarding-mode {
      sa-multicast;
    }
    speed (oc3-stm1 | oc12-stm4 | oc48-stm16);
  }
  adaptive-services {
    service-package (layer-2 | layer-3);
  }
  aggregate-ports;
  atm-cell-relay-accumulation;
  atm-l2circuit-mode (cell | aal5 | trunk trunk);
  vtmapping number;
  ce1 {
    e1 port-number {
      channel-group channel-number timeslots slot-number;
    }
  }
  channelization;
  ct3 {
    port port-number {
      t1 link-number {
        channel-group channel-number timeslots slot-number;
      }
    }
  }
  egress-policer-overhead bytes;
  forwarding-mode {
    sa-multicast;
    vlan-steering {
    vlan-rule (high-low | odd-even);
    }
  }
  framing (sdh | sonet);
  fru-poweron-sequence;
  idle-cell-format {
    itu-t;
    payload-pattern payload-pattern-byte;
  }
  ingress-policer-overhead bytes;
  linerate-mode;
  max-queues-per-interface (8 | 4);
  mlfr-uni-nni-bundles number;
  number-of-ports;
```

```
      no-concatenate;
      no-multi-rate;
      q-pic-large-buffer {
        large-scale;
        small-scale;
      }
      red-buffer-occupancy {
        weighted-averaged [ instant-usage-weight-exponent weight-value ];
      }
    sparse-dlcis;
    traffic-manager {
      egress-shaping-overhead number;
      ingress-shaping-overhead number;
      mode {
        egress-only;
        ingress-and-egress;
        session-shaping;
      }
    }
    tunnel-services {
    bandwidth (1g | 10g);
    vtmapping (itu-t | klm);
    }
  }
  fpc-resync;
  fpc-feb-connectivity {
    fpc slot-number feb (slot-number | none);
  }
  lcc number {
    fpc number {
      pic number {
        atm-cell-relay-accumulation;
        atm-l2circuit-mode (cell | aal5 | trunk trunk);
        framing (sdh | sonet);
        idle-cell-format {
          itu-t;
          payload-pattern payload-pattern-byte;
        }
        linerate-mode;
        max-queues-per-interface (8 | 4);
        no-concatenate;
        no-mcast-replication;
        hash-key {
          family {
            inet {
              layer-3;
              layer-4;
              symmetric-hash {
                complement;
              }
            }
            multiservice {
              source-mac;
              destination-mac;
              payload {
                ip {
```

```
                    layer-3;
                    layer-4;
                  }
                }
                symmetric-hash {
                  complement;
                }
              }
            }
          }
        }
      }
      pem {
        feeds number-of-input-feeds;
      }
      maximum-ecmp;
      offline;
      online-expected;
      sampling-instance;
    }
    lcc-mode {
      lcc number {
        mode mode;
      }
    }
    memory-enhanced{
      filter;
      route;
      vpn-label;
    }
    (packet-scheduling | no-packet-scheduling);
    pem {
      minimum number;
      feeds number-of-input-feeds;
      input-current amps-in-each-feed;
    }
    no-concatenate;
    redundancy {
      cfeb slot (always | preferred);
      failover {
        on-disk-failure
        on-loss-of-keepalives;
      }
      feb {
        redundancy-group group-name {
          feb slot-number (backup | primary);
          description description;
          no-auto-failover;
          }
        }
      port-mirror-instance port-mirroring-instance-name;
      graceful-switchover;
      keepalive-time seconds;
      routing-engine slot-number (master | backup | disabled);
      sfm slot-number (always | preferred);
      ssb slot-number (always | preferred);
```

```
    }
    network-services (ethernet |enhanced-ethernet | ip | enhanced-ip);
    route-localization {
      inet;
      inet6;
    }
    routing-engine {
      on-disk-failure {
        disk-failure-action (halt | reboot);
      }
    }
    sfm slot-number {
      power off;
    }
    sib {
      minimum number;
    }
    vrf-mtu-check;
    vtmapping (itu-t | klm);
    synchronization {
      signal-type (e1 | t1);
      switching-mode (revertive | non-revertive);
      y-cable-line-termination;
      transmitter-enable;
      validation-interval seconds;
      primary (external-a | external-b);
      secondary (external-a | external-b);
    }
  }
```

NOTE: The configuration statements at the **[edit chassis lcc]** hierarchy level apply only to a routing matrix based on a TX Matrix router or a TX Matrix Plus router. For information about a routing matrix composed of a TX Matrix router and T640 routers, see "TX Matrix Router and T640 Router Configuration Overview" on page 173 and the *TX Matrix Router Hardware Guide*. For information about a routing matrix composed of a TX Matrix Plus router and T1600 routers, see "TX Matrix Plus Router Configuration Overview" on page 178 and the *TX Matrix Plus Router Hardware Guide*.

[edit protocols ptp] Hierarchy Level

```
protocols {
  ptp {
    clock-mode (boundary | ordinary);
    domain domain-value;
    master {
      announce-interval announce-interval-value;
      clock-step (one-step | two-step);
      interface interface-name {
        unicast-mode {
          clock-client ip-address {
            local-ip-address local-ip-address;
```



```
                }
                transport ipv4;
              }
            }
            sync-interval sync-interval-value;
          }
          priority1 priority1-value;
          priority2 priority2-value;
          slave {
            announce-timeout announce-timeout-value;
            delay-request delay-request-value;
            frequency-only;
            interface interface-name {
              unicast-mode {
                clock-source ip-address {
                  local-ip-address local-ip-address;
                }
                transport ipv4;
              }
            }
          }
          unicast-negotiation;
        }
      }
```

Related Documentation

- *[edit protocols] Hierarchy Level*
- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- *Notational Conventions Used in Junos OS Configuration Hierarchies*
- Precision Time Protocol Overview on page 143
- *IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers*

account-layer2-overhead (PIC Level)

Syntax account-layer2-overhead;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced in Junos OS Release 13.2.

Description Enable the automatic adjustment of Layer 2 overhead in bytes, which is the octet adjustment per packet, based on the encapsulation on the logical interface for the total octet count for ingress and egress traffic on all the interfaces in the PIC.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 255
- Configuring Layer 2 Overhead Accounting in Interface Statistics on page 257
- Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 258
- *[edit chassis] Hierarchy Level*

action

Syntax

```
action {
  alarm;
  disable-pfe;
  log;
}
```

Hierarchy Level [edit chassis **fpc** *slot-number* **error fatal**], [edit chassis **fpc** *slot-number* **error major**], [edit chassis **fpc** *slot-number* **error minor**]

Release Information Statement introduced for PTX Series routers in Junos OS Release 13.3.

Description Configure the action for this level.

Options **alarm**—Raise an FPC alarm.

disable-pfe—Disable Packet Forwarding Engine interfaces on an FPC.

log—Log occurrences to the system log file.

Required Privilege Level interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- Configuring FPC Error Levels and Actions on PTX Series Routers on page 267

action-fpc-restart-disable

Syntax action-fpc-restart-disable;

Hierarchy Level [edit chassis fabric degraded]

Release Information Statement added in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for MX240, MX480, and MX960 routers.
Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.

Description Allow the user to disable restarting of the FPCs during healing from a degraded fabric condition. The device can automatically recover from degraded fabric conditions by restarting both the fabric planes and the FPCs. If the **action-fpc-restart-disable** statement is configured, the healing attempt is limited to restarting the fabric planes only.

Default The system will detect a blackholing condition and try to heal the system.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Disabling FPC Restart on page 360
- Traffic Black Hole Caused by Fabric Degradation on page 351

adaptive-services

Syntax

```
adaptive-services {
  (layer-2 | layer-3);
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Enable a service package on adaptive services interfaces.

Options The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 305
- Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 253
- *Junos Services Interfaces Configuration Guide*
- *Junos OS, Release 14.1*

aggregate-ports

Syntax aggregate-ports;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced in Junos OS Release 8.1.

Description For T Series routers only, specify OC768-over-OC192 mode on the 4-port OC192C PIC. Four OC192 links are aggregated into one OC768 link with one logical interface.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring 4-Port OC192 PIC to Operate in OC768-over-OC192 Mode*

aggregated-devices

Syntax

```
aggregated-devices {
  ethernet {
    device-count number;
    lacp {
      link-protection {
        non-revertive;
      }
      system-priority;
    }
  }
  sonet {
    device-count number;
    }
  maximum-links maximum-links-limit;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 7.4.
Support for LACP link protection and system priority introduced in Junos OS Release 9.3.

Description Configure properties for aggregated devices on the router.

Options The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 291

alarm (chassis)

Syntax

```
alarm {
  interface-type {
    alarm-name (ignore |red | yellow);
  }
}
```

Hierarchy Level

[edit chassis],
[edit chassis interconnect-device *name*],
[edit chassis node-group *name*]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 12.2 for the ACX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Configure the chassis alarms and whether they trigger a red or yellow alarm, or whether they are ignored. Red alarm conditions light the **RED ALARM** LED on either the router's craft interface or the switch's LCD screen and trigger an audible alarm if one is connected to the contact on the craft interface or LCD screen. Yellow alarm conditions light the **YELLOW ALARM** LED on either the router's craft interface or the switch's LCD screen and trigger an audible alarm if one is connected to the craft interface or LCD screen.

To configure more than one alarm, include multiple ***alarm-name*** lines.

Options

alarm-name—Alarm condition. For a list of conditions, see Table 25 on page 380.

ignore—The specified alarm condition does not set off any alarm.

interface-type—Type of interface on which you are configuring the alarm: **atm**, **ethernet**, **sonet**, or **t3**.

red—The specified alarm condition sets off a red alarm.

yellow—The specified alarm condition sets off a yellow alarm.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Understanding Alarms*
- Chassis Conditions That Trigger Alarms on page 381
- *Chassis Alarm Messages on a QFX3500 Device*
- *Interface Alarm Messages*

allow-sram-parity-errors

Syntax allow-sram-parity-errors;

Hierarchy Level [edit chassis fpc *slot-number*]

Release Information Statement introduced in Junos OS Release 8.0.

Description (T Series routers only) Allow SRAM parity errors to occur without restarting the FPC.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

announce-timeout

Syntax announce-timeout *announce-timeout-value*;

Hierarchy Level [edit protocols ptp slave]

Release Information Statement introduced in Junos OS Release 12.2.

Description Specify the number of announce messages a slave—configured on an ACX Series router—must miss before an announce-timeout is declared. Announce messages are sent by the master to the slave.

Options *announce-timeout-value*—The announce timeout value for announce interval messages.

Range: 2 through 10

Default: 3

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

announce-interval

Syntax announce-interval *announce-interval-value*;

Hierarchy Level [edit protocols ptp master]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the logarithmic mean interval for the announce messages to be sent by the master. By default, one announce message is sent in every two seconds.

Options *announce-interval-value*—The announce interval value for the announce messages.

Range: 0 through 4

Default: 1

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

atm-cell-relay-accumulation

Syntax atm-cell-relay-accumulation;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number*] (Routing Matrix)

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure an Asynchronous Transfer Mode (ATM) Physical Interface Card (PIC) in cell-relay accumulation mode.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 275

atm-l2circuit-mode

Syntax atm-l2circuit-mode (cell | aal5 | trunk *trunk*);

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number*] (Routing Matrix)

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the ATM2 intelligent queuing (IQ) Layer 2 circuit transport mode.

Default aal5

Options **aal5**—Tunnel a stream of ATM cells encoded with ATM Adaptation Layer (AAL5) over an IP Multiprotocol Label Switching (MPLS) backbone.

cell—Tunnel a stream of ATM cells over an IP MPLS backbone.

trunk ***trunk***—Transport ATM cells over an MPLS core network that is implemented on some other vendor switches. Trunk mode can be **UNI** or **NNI**.

NOTE: To determine which vendors support Layer 2 circuit trunk mode, contact Juniper Networks Customer Support.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 345

bandwidth (Tunnel Services)

Syntax bandwidth *bandwidth-value*;

Hierarchy Level [edit chassis fpc *slot-number* pic *number* tunnel-services]

Release Information Statement introduced in Junos OS Release 8.2.

Description (MX Series 3D Universal Edge Routers and T4000 Core Routers only) Specify the amount of bandwidth in gigabits per second to reserve for tunnel services.

Options *bandwidth-value*—Define the amount of bandwidth in gigabits per second to reserve for tunnel services. On MX Series routers, the bandwidth values can be **1g**, **10g**, **20g**, or **40g**. On T4000 routers, the bandwidth values are multiples of **10g** up to **100g**.

NOTE: The bandwidth that you specify determines the port number of the tunnel interfaces that are created. When you specify a bandwidth of 1g, the port number is always 10. When you specify any other bandwidth, the port number is always 0.

NOTE: If you specify a bandwidth that is not compatible with the type of DPCs or MPCs and their respective Packet Forwarding Engine, tunnel services are not activated. For example, you cannot specify 1 gigabit per second bandwidth for a Packet Forwarding Engine on a 10-Gigabit Ethernet 4-port DPC.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 423
- *Configuring Tunnel Interfaces on MX Series Routers*
- *Configuring Tunnel Interfaces on T4000 Routers*
- Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 424
- Example: Configuring Tunnel Interfaces on the MPC3E on page 424
- *Configuring Layer 3 Tunnel Services Interfaces on an MX Series Router with a DPC*
- **tunnel-services (Chassis) on page 597**
- *[edit chassis] Hierarchy Level*

ce1

Syntax

```
ce1 {
  e1 port-number {
    channel-group channel-number timeslots slot-number;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure channelized E1 port and channel specifications.

Options **e1** ***port-number***—Any valid E1 port number on the host system.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 278

channel-group

Syntax channel-group *channel-number* timeslots *slot-number*;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* ce1 e1 *link-number*],
[edit chassis fpc *slot-number* pic *pic-number* ct3 port *port-number* t1 *link-number*],
[edit chassis lcc *lcc-index* fpc *slot-number* pic *pic-number* ce1 e1 *link-number*],
[edit chassis lcc *lcc-index* fpc *slot-number* pic *pic-number* ct3 port *port-number* t1 *link-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the DS0 channel number.

Options *channel-number*—DS0 channel group.

Range: 0 through 7 for DS0 naming, and 0 through 23 for E1 naming.

timeslots ***slot-number***—One or more actual time slot numbers allocated.

Range: 1 through 24 for T1 and 1 through 32 for E1

Default: All time slots for T1 and all time slots for E1

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 299
- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 278

channelization

Syntax channelization;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced in Junos OS Release 11.4.

Description Enable the DS3/E3 MIC on MX Series routers with Queuing and Enhanced Queuing MPCs (MX-MPC1-3D-Q, MX-MPC2-3D-Q, and MX-MPC2-3D-EQ) or on MX80 routers to function in channelized mode.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable Channelization on DS3/E3 MIC on page 301

chassis

Syntax chassis { ... }

Hierarchy Level [edit]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure router chassis properties.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Router Chassis Configuration Statements on page 454

clock-class

Syntax clock-class *clock-class-value*;

Hierarchy Level [edit protocols ptp slave clock-class-to-quality-level-mapping]

Release Information Statement introduced in Junos OS Release 12.2R2.

Description Configure the clock class to the set ESMC quality level.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 338
- Understanding Hybrid Mode on page 164
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133

clock-class-to-quality-level-mapping

Syntax

```
clock-class-to-quality-level-mapping {
  clock-class clock-class-value;
  {
    quality-level ql-value;
  }
}
```

Hierarchy Level [edit protocols ptp slave]

Release Information Statement introduced in Junos OS Release 12.2R2.

Description Configure the slave to override the default Precision Time Protocol (PTP) clock class to Ethernet Synchronization Message Channel (ESMC) mapping.

The remaining statements are explained separately.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 338
- Understanding Hybrid Mode on page 164
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133

clock-source (slave)

Syntax

```
clock-source ip-address {
  local-ip-address local-ip-address;
}
```

Hierarchy Level [edit protocols ptp slave interface *interface-name* unicast-mode transport]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the IP address of the master.

Options *ip-address*—IP address for the master.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

clock-source (hybrid)

Syntax

```
clock-source ip-address {
  interface interface1-name;
  interface interface2-name;
}
```

Hierarchy Level [edit protocols ptp slave hybrid synchronous-ethernet-mapping]

Release Information Statement introduced in Junos OS Release 12.2R2.

Description Configure the IP address of the PTP master and its possible Synchronous Ethernet source interfaces.

Options **interface *interface1-name***—Synchronous Ethernet interface traceable to the same PTP master clock.

interface *interface2-name*—Synchronous Ethernet interface traceable to the same PTP master clock.

NOTE: You must first configure these interfaces at the **[edit chassis synchronization]** hierarchy level as Synchronous Ethernet sources. For information about configuring the interfaces, see synchronization (MX Series).

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 338
- Understanding Hybrid Mode on page 164
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133

clock-mode

Syntax clock-mode (boundary | ordinary);

Hierarchy Level [edit protocols ptp]

Release Information Statement introduced in Junos OS Release 12.2.
Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.

Description Configure the clock mode as either boundary clock or ordinary clock. The clock mode determines whether the node is going to act as a slave, master, or both. This attribute is mandatory and has no default value.

Options **boundary**—The clock mode of the node is a boundary clock where the clock acts as both master and slave.

NOTE: A boundary clock is not supported on the ACX Series routers for 12.2.

ordinary—The clock mode of the node is a system clock where the clock acts either as a master or as a slave.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

- *IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers*

clock-mode (Clock Synchronization)

Syntax clock-mode (auto-select | free-run);

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in Junos OS Release 11.2 R4 for MX Series routers.

Description Configure the mode of operation to select the clock source from a free-run local oscillator or from an external qualified clock. On MX240, MX480, and MX960 routers with enhanced MPCs, the free-run clock is provided by a local oscillator. On other MX Series routers, the free-run clock is provided by the SCB.

Default auto-select

Options **auto-select**—Select the best external clock source as a clock source.

free-run—Select the free-run local oscillator as a clock source.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

clock-client

Syntax clock-client *ip-address*;

Hierarchy Level [edit protocols ptp master interface *interface-name* unicast-mode transport ipv4]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the IP address of the slave.

Options *ip-address*—The IP address for the slave.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

clock-step

Syntax clock-step (one-step | two-step);

Hierarchy Level [edit protocols ptp master]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the clock step that determines whether the timing information is sent along with the synchronous message (one-step) only or a subsequent follow-up message (two-step) is received for the sent synchronous message.

Options **one-step**—One clock step to send timing information along with the synchronous message.

two-step—Two clock steps to send timing information and receive a subsequent follow-up message.

Default: one-step

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

convert-clock-class-to-quality-level

Syntax convert-clock-class-to-quality-level;

Hierarchy Level [edit protocols ptp slave]

Release Information Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers. Statement introduced in Junos OS Release 12.2R2 for MX Series 3D Universal Edge Routers.

Description Configure the slave to enable it to retrieve Ethernet Synchronization Message Channel (ESMC) information from the Precision Time Protocol (PTP) clock class.

When this option is set, the outgoing quality level depends on the PTP clock class mapping, irrespective of the clock being configured in hybrid mode or pure PTP mode. This is the default mapping mode of the ESMC quality level value to the clock class.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 338
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133
- Understanding ESMC Quality Level Mapping on page 160
- Understanding Hybrid Mode on page 164

craft-lockout

Syntax craft-lockout;

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 8.1.

Description Disable the physical operation of the craft interface front panel.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 373

ct3

Syntax

```
ct3 {
  port port-number {
    t1 link-number {
      channel-group channel-number timeslots slot-number;
    }
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure channelized T3 port and channel specifications.

Options **port *port-number***—Any valid T3 port number on the host system.

t1 *link-number*—T1 link.

Range: 0 through 27

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 299

degraded

Syntax

```
degraded {
  action-fpc-restart-disable;
  degraded-fabric-detection-enable;
  degraded-fpc-bad-plane-threshold number-bad-planes;
}
```

Hierarchy Level [edit chassis fabric degraded]

Release Information Statement introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.

Description Configure options that apply to degraded chassis fabric conditions.

Options The statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- Disabling FPC Restart on page 360

degraded-fabric-detection-enable

Syntax degraded-fabric-detection-enable;

Hierarchy Level [edit chassis fabric degraded]

Release Information Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.

Description Enable detection of an FPC with degraded fabric.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- Disabling FPC Restart on page 360

degraded-fpc-bad-plane-threshold

Syntax degraded-fpc-bad-plane-threshold *number-bad-planes*;

Hierarchy Level [edit chassis fabric degraded]

Release Information Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.

Description Configure the number of bad planes that indicate an FPC is degraded.

Options **number-bad-planes**—Number of bad planes.

Range: 4 through 18

Default: 4

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- Disabling FPC Restart on page 360

delay-request

Syntax delay-request *delay-request-value*;

Hierarchy Level [edit protocols ptp slave]
[edit protocols ptp slave (ACX Series)]

Release Information Statement introduced in Junos OS Release 12.2.
Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.

Description Configure the logarithmic mean interval in seconds between the delay request messages sent by the slave to the master.

Options ***delay-request-value***—The delay request value for the delay request messages.

Range: –6 through +6

Default: 0

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

device-count

Syntax device-count *number*;

Hierarchy Level [edit chassis aggregated-devices ethernet]
[edit chassis aggregated-devices sonet]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the number of aggregated logical devices available to the router.

Options **number**—Number of aggregated logical devices available to the router.

NOTE: Starting with Junos OS Release 13.2, a maximum of 64 aggregated interfaces are supported for link aggregation of SONET/SDH interfaces. In releases before Junos OS Release 13.2, a maximum of 16 aggregated interfaces are supported for link aggregation of SONET/SDH interfaces.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 291
- *Configuring Aggregated SONET/SDH Interfaces*

disk-failure-action

Syntax disk-failure-action (halt | reboot);

Hierarchy Level [edit chassis routing-engine on-disk-failure]

Release Information Statement introduced in Junos OS Release 9.0.

Description Configure the Routing Engine to halt or reboot when the Routing Engine hard disk fails.

Options **halt**—Specify the Routing Engine to halt.

reboot—Specify the Routing Engine to reboot.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 365

domain

Syntax domain *domain-value*;

Hierarchy Level [edit protocols ptp]

Release Information Statement introduced in Junos OS Release 12.2.
Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.

Description Configure multiple independent Precision Time Protocol (PTP) domains.

NOTE: Only one PTP domain is supported at any given point in time.

Options ***domain-value***—The PTP domain value.

Range: 0 through 127

Default: 0

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

dynamic-profile-options

Syntax

```
dynamic-profile-options {
   versioning;
}
```

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.4.

Description Configure global dynamic profile options.

The remaining statement is explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Enabling Dynamic Profiles to Use Multiple Versions*

e1

Syntax

```
e1 port-number {
  channel-group channel-number timeslots slot-number;
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* ce1]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the channelized E1 port number on the PIC. The range is from **0** through **9**.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 278

e1-options (Clock Synchronization)

Syntax

```
e1-options {
  framing (g704 | g704-no-crc4);
  line-encoding (ami | hdb3);
  sabit bit;
}
```

Hierarchy Level [edit chassis synchronization interfaces external]
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the E1 interface options.

Options The statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

egress-policer-overhead

Syntax egress-policer-overhead *bytes*;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 11.1.

Description Add the specified number of bytes to the actual length of an Ethernet frame when determining the actions of Layer 2 policers, MAC policers, or queue rate limits applied to output traffic on the line card. You can configure egress policer overhead to account for egress *shaping* overhead bytes added to output traffic on the line card.

On M Series and T Series routers, this statement is supported on Gigabit Ethernet Intelligent Queuing 2 (IQ2) PICs and Enhanced IQ2 (IQ2E) PICs. On MX Series routers, this statement is supported for interfaces configured on Dense Port Concentrators (DPCs).

NOTE: This statement is not supported on Modular Interface Cards (MICs) or Modular Port Concentrators (MPCs) in MX Series routers.

Options *bytes*—Number of bytes added to a packet exiting an interface.

Range: 0–255 bytes

Default: 0

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *egress-shaping-overhead*
- *Policer Overhead to Account for Rate Shaping Overview*
- *Example: Configuring Policer Overhead to Account for Rate Shaping*
- Configuring a Policer Overhead on page 284
- *CoS on Enhanced IQ2 PICs Overview*

enhanced-mode (network-services)

Syntax enhanced-mode;

Hierarchy Level [edit chassis network-services]

Release Information Statement introduced in Junos OS Release 12.3 for T4000 Core Routers with Type 5 FPCs.

Description Enable improved virtual private LAN service (VPLS) MAC address learning by supporting up to 262,143 MAC addresses per VPLS routing instance.

NOTE:

- The **enhanced-mode** statement supports up to 262,143 MAC addresses per VPLS routing instance. However, the MAC address learning limit for each interface remains the same (that is, 65,535 MAC addresses).
- After you configure the **enhanced-mode** statement and commit your configuration, a warning message prompts you to reboot the router. You must reboot the router and then modify the size of the VPLS MAC address table, otherwise the improved VPLS MAC address learning does not take effect.
- When the T4000 router reboots after the **enhanced-mode** statement is configured, only the T4000 Type 5 FPCs are online while the remaining FPCs are offline.

Default By default, the improved VPLS MAC address learning feature is disabled.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Network Services Mode Overview on page 167
- **show chassis fpc on page 1212**

- *mac-table-size*

error

Syntax

```
error {
  [fatal | major | minor] {
    threshold threshold-value;
    action {
      alarm;
      disable-pfe;
      log;
    }
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number*]

Release Information Statement introduced for PTX Series routers in Junos OS Release 13.3.

Description Configure FPC error levels.

The statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- Configuring FPC Error Levels and Actions on PTX Series Routers on page 267

esmc-transmit

Syntax

```
esmc-transmit {
  interfaces (all | interface-name);
}
```

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in Junos OS Release 11.2 R4 for MX Series routers.

Description Enable Ethernet Synchronization Message Channel (ESMC) packet transmission on all the interfaces or on a specific interface.

Options ***interface-name***—Enable ESMC packet transmission on this interface.

all—Enable ESMC packet transmission on all interfaces.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

ethernet (Chassis)

Syntax

```
ethernet {
  device-count number;
  lacp {
    link-protection {
      non-revertive;
    }
    system-priority;
  }
}
```

Hierarchy Level [edit chassis aggregated-devices]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 11.4 for EX Series switches.

Description Configure properties for Ethernet aggregated devices on the router.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 291
- *Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)*

fabric upgrade-mode

Syntax

```
fabric {
  upgrade-mode;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 7.5.

Description Configure upgrade mode for SIBs and forces them to operate in the same mode until the upgrade is complete.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- TX Matrix Router and T640 Router Configuration Overview on page 173

fabric upgrade-mode 3d-fabric

Syntax (TX Matrix Plus Router)

```
fabric upgrade-mode 3d-fabric;
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 13.2.

Description

- Enable the TX Matrix Plus router to upgrade to a TX Matrix Plus router with 3D SIBs. On the SFC, enable setting proper support for mixed SIBs (TXP-F13 SIB and TXP-F13-3D SIB).
- Enable the T640 or T1600 or T4000 routers in a routing matrix to support mixed SIBs (TXP-T1600 SIB and TXP-3D-LCC SIBs on the T1600 router and SIB-I-T4000 and TXP-3D-LCC SIBs on the T4000 router).

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 218
- Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 212
- *Upgrading an Operational Standalone Router and Integrating It into a TX Matrix Plus Routing Matrix with 3D SIBs*

family

Syntax

```
family {
  inet {
    layer-3;
    layer-4;
    symmetric-hash {
      complement;
    }
  }
  multiservice {
    source-mac;
    destination-mac;
    payload {
      ip {
        layer-3;
        layer-4;
      }
    }
    symmetric-hash {
      complement;
    }
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* hash-key]

Release Information Statement introduced in Junos OS Release 9.6.

Description (MX Series 3D Universal Edge Routers only) Configure data used in a hash key for a specific protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.

Options

inet—Configure data used in a hash key for the **inet** protocol family.

multiservice—Configure data used in a hash key for the **multiservice** protocol family.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 237

fatal

Syntax

```
fatal {
  threshold threshold-value;
  action {
    alarm;
    disable-pfe;
    log;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* error]

Release Information Statement introduced for PTX Series routers in Junos OS Release 13.3.

Description Configure fatal FPC error levels.

The statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- Configuring FPC Error Levels and Actions on PTX Series Routers on page 267

feeds (T640, T1600, and T4000 Routers with Six-Input DC Power Supply)

Syntax feeds *number-of-input-feeds*;

Hierarchy Level [edit chassis pem]
[edit chassis lcc *lcc-number* pem] (Routing Matrix)

Release Information Statement introduced in Junos OS Release 12.1.

Description Configure the number of input feeds connected to the six-input DC power supply on T640, T1600, or T4000 routers. The value assigned to the **feeds** statement must be equal to the number of input feeds provided to the power supply.

When providing four or five input feeds on standalone routers, you must configure the **feeds** statement at the **[edit chassis pem]** hierarchy level. When providing four or five input feeds to an LCC router in a routing matrix, you must configure the **feeds** statement at the **[edit chassis lcc *lcc-number* pem]** hierarchy level.

NOTE:

- Before configuring input feeds for your router, see the *T640 Core Router Hardware Guide*, *T1600 Core Router Hardware Guide*, or *T4000 Core Router Hardware Guide* for special considerations and for the number of input feeds supported by the router.
- All power supplies in the router must use the same number of inputs feeds.

Options **Range:** 4 through 6
Default: 6

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Configuring the Six-Input DC Power Supply on page 375

fib-local

Syntax fib-local;

Hierarchy Level [edit chassis fpc *fpc-number* route-localization]

Release Information Statement introduced in Junos OS Release 11.4.

Description Configure the Packet Forwarding Engine on an FPC as FIB-local.

NOTE: At least, one Packet Forwarding Engine must be configured as fib-local for the commit operation to be successful. If you do not configure fib-local for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Packet Forwarding Engine FIB Localization on page 194

fib-remote

Syntax fib-remote;

Hierarchy Level [edit chassis fpc *fpc-number* route-localization]

Release Information Statement introduced in Junos OS Release 11.4.

Description Configure the Packet Forwarding Engine on an FPC as FIB-remote.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Packet Forwarding Engine FIB Localization on page 194

filter

Syntax filter;

Hierarchy Level [edit chassis memory-enhanced]

Release Information Statement added in Junos OS Release 11.1.

Description Enables storing of firewall filters across multiple static RAM (SRAM) segments, resulting in proper utilization of SRAM segments. This feature is useful in routers with small routing tables and large firewall filters. This statement is supported on T Series routers.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 362

flexible-queuing-mode

Syntax flexible-queuing-mode;

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 14.1 for MPC5E.

Description Enable flexible queuing on a non-HQoS MPCE that is installed in an MPC slot. A maximum of up to 32,000 queues are supported per port and per card, including queues on both ingress and egress interfaces.

When flexible queuing is enabled, the non-HQoS MPC is restarted for the changes to take effect and is brought online only if the power required for the queuing component is available in the power entry module (PEM). The MPC remains offline if the PEM cannot meet the power requirement for the queuing component.

You can configure flexible queuing even when a non-HQoS MPC is not present in the chassis. The configuration takes effect when a non-HQoS MPC is installed.

NOTE: This feature is supported only on non-HQoS variants of MPC5E.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Disabling Flexible Queuing for non-HQoS MPCs to Optimize Power Utilization on page 261
- Flexible Queuing Mode Overview on page 25
- *Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC5Es*
- Upgrading non-HQoS MPCs to Support Flexible Queuing on page 260

fpc (M320, T320, T640 and PTX Series Routers)

Syntax

```
fpc slot-number {
  error {
    [fatal | major | minor] {
      threshold threshold-value;
      action {
        alarm;
        disable-pfe;
        log;
      }
    }
  }
  picpic pic-number {
    ce1 {
      e1 port-number {
        channel-group group-number timeslots slot-number;
      }
    }
    ct3 {
      port port-number {
        t1 link-number {
          channel-group group-number timeslots slot-number;
        }
      }
    }
    framing (sdh | sonet);
    idle-cell-format {
      itu-t;
      payload-pattern payload-pattern-byte;
    }
    max-queues-per-interface (8 | 4);
    no-concatenate;
    q-pic-large-buffer (large-scale | small-scale);
  }
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 7.4.
Error statement introduced for PTX Series routers in Junos OS Release 13.3.

Description Configure properties for the PICs in individual Flexible PIC Concentrators (FPCs).

Options *slot-number*—Slot number in which the FPC is installed.

Range: M320, T640, T1600, T4000, and PTX5000 routers: 0 through 7

Range: PTX3000 routers: 0, 2, 4, 6, 8, 10, 12, 14

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 271
- Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 277
- Configuring FPC Error Levels and Actions on PTX Series Routers on page 267

fpc (MX Series 3D Universal Edge Routers)

Syntax

```
fpc slot-number {
  inline-services {
    flow-table-size {
      ipv4-flow-table-size units;
      ipv4-flow-table-size  units;
    }
  }
  pic number {
    inline-services {
      bandwidth (1g | 10g);
    }
    port-mirror-instance port-mirroring-instance-name-pic-level;
    tunnel-services {
      bandwidth (1g | 10g)
    }
  }
  port-mirror-instance port-mirroring-instance-name-fpc-level;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 8.2.
Option **port-mirror-instance** introduced in Junos OS Release 9.3.

Description Configure properties for the DPC or MPC and corresponding Packet Forwarding Engines to create tunnel interfaces.

(MX Series Virtual Chassis only) To configure properties for MPCs in a member router in an MX Series Virtual Chassis configuration, you must specify the router's Virtual Chassis member number *before* the **fpc** statement. Specify the member number in the form **member** ***member-id***, where ***member-id*** is 0 or 1. If you do not specify the member number before the **fpc** statement, the commit operation fails and the software displays an error message indicating that the **fpc** statement must include the member number for routers in Virtual Chassis mode.

Options **fpc** ***slot-number***—Specify the slot number of the DPC.

Range: 0 through 11

pic ***number***—Specify the number of the Packet Forwarding Engine. Each DPC includes four Packet Forwarding Engines.

Range: 0 through 4

port-mirror-instance ***port-mirroring-instance-name-fpc-level***—Associate a port-mirroring instance with the DPC and its corresponding PICs. The port-mirroring instance is configured under the **[edit forwarding-options port-mirroring]** hierarchy level.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers on page 236
- *Enabling Inline Service Interfaces*

fpc (TX Matrix and TX Matrix Plus Routers)

Syntax

```
fpc slot-number {
  pic pic-number {
    atm-cell-relay-accumulation;
    atm-l2circuit-mode (cell | aal5 | trunk trunk);
    framing (sdh | sonet);
    idle-cell-format {
      itu-t;
      payload-pattern payload-pattern-byte;
    }
    max-queues-per-interface (8 | 4);
    no-concatenate;
    no-mcast-replication;
    q-pic-large-buffer (large-scale | small-scale);
  }
}
```

Hierarchy Level

[edit chassis lcc *number*]

Release Information

Statement introduced before Junos OS Release 7.4.

Description

On a TX Matrix or TX Matrix Plus router, configure properties for the PICs in individual FPCs.

Options

slot-number—Slot number in which the FPC is installed.

Range: 0 through 7

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- TX Matrix Router and T640 Router Configuration Overview on page 173
- TX Matrix Plus Router Configuration Overview on page 178
- Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 271
- TX Matrix Router Chassis and Interface Names on page 176
- TX Matrix Plus Router Chassis and Interface Names on page 182

fpc-feb-connectivity

Syntax

```
fpc-feb-connectivity {
  fpc number feb (slot-number | none);
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 8.0.

Description On the M120 router only, configure a connection between any Flexible PIC Concentrator (FPC) and any Forwarding Engine Board (FEB).

Options **fpc *number***—Specify the FPC slot number.

Range: 0 through 5

feb *slot-number*—Specify the FEB slot number.

Range: : 0 through 5

none—Disconnect the FPC from the FEB.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers on page 231

fpc-nmi-volt-fail-knob

Syntax fpc-nmi-volt-fail-knob (enable | disable)

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 10.4R15, 11.4R8-S2, 11.4R9, 12.1R8, 12.2R6, 12.3R3-S1, 12.3R4, 13.1R3, and 13.2R1

Description Enable or disable the non maskable interrupt (NMI) for the voltage failure errors on the flexible pic concentrator (FPC).

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration

Related Documentation

- **show chassis fpc on page 1212**
- Configuring Voltage Level Monitoring of FPCs on T Series Routers on page 265

fpc-resync

Syntax fpc-resync;

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 10.2.

Description (On M320, T320, T640, T1600, T4000, TX Matrix, and TX Matrix Plus routers only) When a Flexible PIC Concentrator (FPC) is brought online, resynchronize the sequence numbers of the FPC with the other active FPCs.

NOTE: **In order to prevent traffic blackholing, the fpc-resync command will have no effect if a single LMNR based FPC and one or more I-chip FPCs exist in the same chassis.**

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 289
- *TX Matrix Router Hardware Guide*

framing

Syntax framing (sdh | sonet);

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number*] (Routing Matrix)

Release Information Statement introduced before Junos OS Release 7.4.

Description On SONET/SDH PICs only, configure the framing type.

Default **sonet**

Options **sdh**—SDH framing.

sonet—SONET framing.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 271

framing (E1 Options)

Syntax framing (g704 | g704-no-crc4);

Hierarchy Level [edit chassis synchronization interfaces external e1-options]
[edit chassis synchronization interfaces (external-0/0 | external-1/0) e1-options]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the framing format for the E1 interface.

Options **g704**—Set the G.704 framing format for E1 interfaces.

g704-no-crc4—Set the G.704 framing without CRC4 for E1 interfaces.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

framing (T1 Options)

Syntax framing (esf | sf);

Hierarchy Level [edit chassis synchronization interfaces external t1-options]
[edit chassis synchronization interfaces (external-0/0 | external-1/0) t1-options]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the framing format for the T1 interface.

Options **esf**—Set the framing format as extended super frame.

sf—Set the framing format as super frame.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

fru-poweron-sequence

Syntax fru-poweron-sequence *fru-poweron-sequence*;

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 10.0.
Statement introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Statement introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Statement introduced in Junos OS Release 12.3 for T640, T1600, and T4000 routers.

Description (MX Series 3D Universal Edge Routers only) Configure the power-on sequence for the DPCs in the chassis for routers with the enhanced AC Power Entry Module (PEM).

(T640 routers, T1600 routers, T4000 routers, MX2020 routers, and PTX Series packet transport routers) Configure the power-on sequence for Flexible PIC Concentrators (FPCs) installed in the chassis.

Options (MX Series 3D Universal Edge Routers only) ***fru-poweron-sequence***—Power-on sequence for the DPCs in the chassis. The numbers indicate the slot number of the DPCs.

NOTE: If the power-on sequence is not configured by including the **fru-poweron-sequence** statement, Junos OS uses the **/var/log/poweron_seq.log** file to determine the power-on sequence for the last power-on operation for the DPCs and the same sequence is used. If the **/var/log/boot_seq.log** file, is not available, Junos OS uses the ascending order of the slot numbers of the DPCs as the sequence to power on the DPCs.

(T640 routers, T1600 routers, T4000 routers, MX2020 routers, and PTX Series packet transport routers) ***fru-poweron-sequence***—Power-on sequence for the FPCs in the chassis. The numbers indicate the slot number of the FPCs.

NOTE:

- If the configured sequence contains invalid numbers, Junos OS considers only the valid numbers in the sequence. The invalid numbers are silently discarded.
- If the power-on sequence is not configured by including the **fru-poweron-sequence** statement, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power on the FPCs.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Power-On Sequence for DPCs on MX Series Routers with the Enhanced AC PEM on page 253
- Configuring the Power-On Sequence for FPCs on PTX Series Packet Transport Routers on page 267
- Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 263

frequency-only

Syntax frequency-only;

Hierarchy Level [edit protocols ptp **slave**]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure frequency synchronization.

NOTE: This option is configured only when PTP is used for frequency synchronization and not for phase synchronization.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

hash-key (Chassis LAG)

Syntax

```
hash-key {
  family {
    inet {
      layer-3;
      layer-4;
      symmetric-hash {
        complement;
      }
    }
    multiservice {
      source-mac;
      destination-mac;
      payload {
        ip {
          layer-3 (source-ip-only | destination-ip-only);
          layer-4;
        }
      }
    }
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced in Junos OS Release 9.6.

Description (MX Series 3D Universal Edge Routers only) Configure data used in a hash key for a PIC for symmetrical load balancing on an 802.3ad Link Aggregation Group.

Options **family**—Configure data used in a hash key for a protocol family. This statement has the following suboptions:

- **inet**—Configure data used in a hash key for the **inet** protocol family.
- **multiservice**—Configure data used in a hash key for the **multiservice** protocol family.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 237

hold-interval (Clock Synchronization)

Syntax

```
hold-interval {
  configuration-change seconds;
  restart seconds;
  switchover seconds;
}
```

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in Junos OS Release 11.2R4 for MX Series routers.

Description Configure the wait time for clock selection after a change in configuration and after a reboot of the router, and configure the switchover wait time after clock recovery.

Options **configuration-change**—Set the wait time for clock selection after a change in configuration.

Range: 15 seconds through 60 seconds

restart—Set the wait time for clock selection after reboot of the router.

Range: 60 seconds through 180 seconds

Default: 120 seconds

switchover—Set the switchover wait time after clock recovery.

Range: 30 seconds through 60 seconds.

Default: 30 seconds

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

holdover-mode-disable

Syntax holdover-mode-disable;

Hierarchy Level [edit chassis synchronization output interfaces external]
[edit chassis synchronization output interfaces (external-0/0 | external-1/0)]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Disable the holdover mode on the external output interface—external—on SCBE or on the external output interfaces—external-0/0 and external-1/0—on SCBE2.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

hybrid

Syntax

```
hybrid {
  synchronous-ethernet-mapping {
    clock-source ip-address {
      interface interface1-name;
      interface interface2-name;
    }
  }
}
```

Hierarchy Level [edit protocols ptp slave]

Release Information Statement introduced in Junos OS Release 12.2R2.

Description Configure hybrid mode.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 338
- Understanding Hybrid Mode on page 164
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133

idle-cell-format

Syntax

```
idle-cell-format {
  itu-t;
  payload-pattern payload-pattern-byte;
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* idle-cell-format],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number* idle-cell-format] (Routing Matrix)

Release Information Statement introduced before Junos OS Release 7.4.

Description For ATM2 PICs only, configure the format of the idle cell header and payload bytes.

Options **itu-t**—Configure the idle cell header to use the International Telecommunications Union (ITU-T) standard of 0x00000001.

Default: (4 bytes): 0x00000000

payload-pattern-byte—Configure the idle cell payload pattern. The payload pattern byte can range from 0x00 through 0xff.

Default: cell payload (48 bytes)

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 346

inet (chassis)

Syntax

```
inet {
  layer-3;
  layer-4;
  symmetric-hash {
    complement;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* hash-key family]

Release Information Statement introduced in Junos OS Release 9.6.

Description (MX Series 3D Universal Edge Routers only) Configure data used in a hash key for the **inet** protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.

Options **layer-3**—Include Layer 3 IP data in the hash key.

layer-4—Include Layer 4 IP data in the hash key.

symmetric-hash—Configure symmetric hash key with source and destination ports.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 237

ingress-policer-overhead

Syntax ingress-policer-overhead *bytes*;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 11.1

Description Add the configured number of bytes to the length of a packet entering the interface.

Options ***bytes***—Number of bytes added to a packet entering an interface.

Range: 0–255 bytes

Default: 0

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *ingress-shaping-overhead*
- *Policer Overhead to Account for Rate Shaping Overview*
- *Example: Configuring Policer Overhead to Account for Rate Shaping*
- Configuring a Policer Overhead on page 284
- *CoS on Enhanced IQ2 PICs Overview*

input-current (T4000 Routers)

Syntax input-current *amps-in-each-feed*;

Hierarchy Level [edit chassis pem]

Release Information Statement introduced in Junos OS Release 12.3.

Description Configure the amount of input current received in each feed. The value assigned to the **input-current** statement must be equal to the input current capability of each feed.

NOTE: Before configuring input current for your router, see the *T4000 Core Router Hardware Guide* for special considerations.

Options **Values:**

- 40—Indicates 40 A of input current is received in each feed.
- 60—Indicates 60 A of input current is received in each feed.

Default: 60 A

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Six-Input DC Power Supply on page 375

interfaces external

Syntax

```
interfaces {
external/external-0-0/external-1/0 {
  e1-options {
    framing (g704 | g704-no-crc4);
    line-encoding (ami | hdb3);
    sabit bit;
  }
  signal-type (1mhz | 5mhz | 10mhz | 2048khz | t1 | e1);
  t1-options {
    framing (esf | sf);
    line-encoding (ami | b8zs);
  }
  pulse-per-second-enable;
  }
}
```

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Starting from Junos OS Release 12.3, configure options for the external clock source interface—external—for SCBE.

Starting from Junos OS Release 13.3, configure options for the two external clock source interfaces—external-0/0 and external-1/0—for SCBE2.

Options The statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

lacp

Syntax

```
lacp {
  link-protection {
    non-revertive;
  }
  system-priority priority;
}
```

Hierarchy Level [edit chassis aggregated-devices ethernet]

Release Information Statement introduced in Junos OS Release 9.3.

Description For aggregated Ethernet interfaces only, configure Link Aggregation Control Protocol (LACP) parameters at the global level for use by LACP at the interface level.

Options The statements are described separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 291

lcc

Syntax

```
lcc number {
  fpc slot-number {
    pic pic-number {
      atm-cell-relay-accumulation;
      atm-l2circuit-mode (cell | aal5 | trunk trunk);
      framing (sdh | sonet);
      idle-cell-format {
        itu-t;
        payload-pattern payload-pattern-byte;
      }
      max-queues-per-interface (8 | 4);
      no-concatenate;
      no-mcast-replication;
    }
  }
  online-expected;
  offline;
  }
  q-pic-large-buffer {
    large-scale;
  }
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure a T640 router (on a routing matrix based on a TX Matrix router) or a T1600 router (on a routing matrix based on a TX Matrix Plus router) or a T4000 router (on a routing matrix based on a TX Matrix Plus router).

Options *number*—Specify a T640 router or a T1600 router or a T4000 router on a routing matrix.

Range:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- TX Matrix Router and T640 Router Configuration Overview on page 173
- Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 189
- TX Matrix Plus Router Configuration Overview on page 178
- Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 205
- *TX Matrix Router Hardware Guide*
- *TX Matrix Plus Router Hardware Guide*

lcc-mode

Syntax

```
lcc-mode {
  lcc lcc_number{
    mode mode;
  }
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 13.1 for TX Matrix Plus routers with 3D SIBs.

Description Set the line-card chassis (LCC) in a routing matrix to function as a T1600 router or a T4000 router. If you set the value of the ***mode*** variable as **empty**, then the line-card chassis goes offline. If the **mode** statement is not configured, then by default the LCC functions as a T1600 router.

Default If you do not include the **lcc-mode** statement, the LCC functions as a T1600 router.

Options **lcc *number***—On a TX Matrix Plus router, display hardware information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

mode *mode*—Configure the LCC to function as a T1600 or a T4000 router. The value of the *mode* variable can be set as **t1600**, **t4000**, or **empty**.

Required Privilege Level interface-control

Related Documentation

- *Overview of a Routing Matrix with a TX Matrix Plus Router*
- *Example: Configuring a Routing Matrix with a TX Matrix Plus Router in Mixed Mode*

line-encoding (E1 Options)

Syntax line-encoding (ami | hdb3);

Hierarchy Level [edit chassis synchronization interfaces external e1-options]
[edit chassis synchronization interfaces (external-0/0 | external-1/0) e1-options]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the line encoding format on the E1 interface.

Options **ami**—Set the line encoding format as automatic mark inversion.

hdb3—Set the line encoding format as high-density bipolar 3 code.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

line-encoding (T1 Options)

Syntax line-encoding (ami | b8zs);

Hierarchy Level [edit chassis synchronization interfaces external t1-options]
[edit chassis synchronization interfaces (external-0/0 | external-1/0) t1-options]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the line encoding format on the T1 interface.

Options **ami**—Set the line encoding format as automatic mark inversion.

b8zs—Set the line encoding format as 8-bit zero suppression.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

linerate-mode

Syntax linerate-mode;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* linerate-mode],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number* linerate-mode] (Routing Matrix)

Release Information Statement introduced in Junos OS Release 10.1.

Description For 10-port 10-Gigabit Oversubscribed Ethernet (OSE) PICs only, configure the line rate operation.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Junos OS Network Interfaces Library for Routing Devices*

link-protection (Protocols LACP)

Syntax

```
link-protection {
  non-revertive;
}
```

Hierarchy Level [edit chassis aggregated-devices ethernet lacp]

Release Information Statement introduced in Junos OS Release 9.3.

Description Enable LACP link protection at the global (chassis) level.

Options The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Configuring Junos OS for Supporting Aggregated Devices on page 291

local-ip-address (master)

Syntax local-ip-address *local-ip-address*;

Hierarchy Level [edit protocols ptp master interface *interface-name* unicast-mode clock-client *ip-address*]

Release Information Statement introduced in Junos OS Release 12.2.

Description The IP address of the interface acting as a master.

Options *local-ip-address*—IP address of the interface.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

local-ip-address (slave)

Syntax local-ip-address *local-ip-address*;

Hierarchy Level [edit protocols ptp slave interface *interface-name* unicast-mode clock-source *ip-address*]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the IP address of the interface acting as the slave.

NOTE: You must configure the same IP address at the [**edit interfaces *interface-name***] hierarchy level.

Options *local-ip-address*—The IP address of the interface.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

major

Syntax

```
major {
  threshold threshold-value;
  action {
    alarm;
    disable-pfe;
    log;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* error]

Release Information Statement introduced for PTX Series routers in Junos OS Release 13.3.

Description Configure major FPC error levels.

The statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- Configuring FPC Error Levels and Actions on PTX Series Routers on page 267

master

Syntax

```
master {
  announce-interval announce-interval--value;
  clock-step (one-step | two-step);
  sync-interval sync-interval-value;
  interface interface-name {
    unicast-mode {
      transport ipv4;
      clock-client ip-address {
        local-ip-address local-ip-address;
      }
    }
  }
}
```

Hierarchy Level [edit protocols ptp]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the master with parameters.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

maximum-ecmp

Syntax maximum-ecmp *next-hops*;

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 10.1.

Description (M10i routers with Enhanced CFEB, and M320, M120, MX Series, and T Series routers) Configure 16, 32, or 64 ECMP next hops for RSVP or LDP LSPs, or MPLS static LSPs that are configured using **set protocols mpls static-label-switched-path**.

NOTE: MX Series routers with one or more Modular Port Concentrator (MPC) cards and with Junos OS 11.4 or earlier installed, support the configuration of the **maximum-ecmp** statement with only 16 next hops. You should *not* configure the **maximum-ecmp** statement with 32 or 64 next hops. When you commit the configuration with 32 or 64 next hops, the following warning message appears:

Error: Number of members in Unilist NH exceeds the maximum supported 16 on Trio.

Default 16

Options *next-hops*—Specify the number of next hops (16, 32, or 64) for RSVP or LDP LSPs, or MPLS static LSPs

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing on page 295

maximum-links

Syntax maximum-links *maximum-links-limit*;

Hierarchy Level [edit chassis aggregated-devices]

Release Information Statement introduced in Junos OS Release 11.1 for T Series routers.
Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.
Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the maximum links limit for aggregated devices. Note that for MX Series routers, to set a range of 32 or 64 the router must be running in Enhanced IP mode, which is only supported for Trio-based MPCs and multiservice DPCs (MS-DPCs). For more information on Enhanced IP mode, "Network Services Mode Overview" on page 167.

For MX series routers and PTX series switches, the option for 64 links is only supported for Junos OS release 12.3 and later.

NOTE: **This statement is not supported on MX80 and MX104 3D Universal Edge Routers.**

Options *maximum-links-limit*—Maximum links limit for aggregated devices.

Range: 16, 32, 64

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Network Services Mode Overview on page 167
- Configuring Junos OS for Supporting Aggregated Devices on page 291
- *Configuring an Aggregated Ethernet Interface*
- **network-services on page 532**

max-queues-per-interface

Syntax max-queues-per-interface (8 | 4);

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number*] (Routing Matrix)

Release Information Statement introduced before Junos OS Release 7.4.
Support for TX Matrix and TX Matrix Plus added in Junos OS Release 9.6.
On MIC or MPC interfaces on MX Series routers, configure eight egress queues.

Description On IQ, MPC, and DPC interfaces on M120, T320, T640, T1600, TX Matrix, and TX Matrix Plus routers, or on MIC or MPC interfaces on MX Series routers, configure eight egress queues.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 233
- *Configuring Up to 16 Forwarding Classes*
- *Enabling Eight Queues on ATM Interfaces*
- *Configuring the Maximum Number of Queues for Trio MPC/MIC Interfaces*

max-transmit-quality-level

Syntax max-transmit-quality-level;

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the threshold quality level for the router. If the received quality level is below the threshold quality level, then the router will send out a received quality level of SEC. The available quality levels are listed in Table 11 on page 151.

Options ***quality-level***—The available quality levels are as given in Table 11 on page 151.

Table 35: Quality Levels

Quality Level	Description
prc	Timing quality of a primary reference clock (option-1 only).
prs	Clock traceable to a primary reference source (option-2 only).
sec	Timing quality of an SDH equipment clock (option-1 only).
smc	Clock traceable to a self-timed SONET (option-2 only).
ssu-a	Timing quality of a type I or IV slave clock (option-1 only).
ssu-b	Timing quality of a type VI slave clock (option-1 only).
st2	Clock traceable to Stratum 2 (option-2 only).
st3	Clock traceable to Stratum 3 (option-2 only).
st3e	Clock traceable to Stratum 3E (option-2 only).
st4	Clock traceable to Stratum 4 free-run (option-2 only).
stu	Clock traceable to an unknown quality (option-2 only).
tnc	Clock traceable to a transit node clock (option-2 only).

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

member

Syntax

```
member member-id {
  fabric-tree-root;
  location location;
  mastership-priority number;
  no-management-vlan;
  serial-number serial-number;
  role role;
}
```

Hierarchy Level [edit virtual-chassis]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 13.2X50-D15 for the QFX Series.
Statement introduced in Junos OS Release 13.2X51-D20 for Virtual Chassis Fabric (VCF).

Description Configure a switch or an XRE200 External Routing Engine as a member of a Virtual Chassis or a Virtual Chassis Fabric (VCF) with characteristics specified by the available options.

Default When an EX Series switch or a QFX Series devices configured in standalone mode is powered on but not interconnected through its Virtual Chassis ports (VCPs) with other member switches, its default member ID is **0**.

There is no default member ID in an EX8200 or EX9200 Virtual Chassis. An EX8200 or EX9200 Virtual Chassis must be preprovisioned, and that process configures the member IDs.

Options ***member-id***—Identifies a specific member switch of a Virtual Chassis or VCF configuration.

The exact range for a specific Virtual Chassis or VCF depends on the number of switches allowed in the Virtual Chassis or VCF.

In an EX8200 Virtual Chassis, member IDs 0 through 7 are reserved for EX8200 member switches and member IDs 8 and 9 are reserved for the master and backup external Routing Engines.

The remaining statement options set characteristics of the Virtual Chassis or VCF member, and are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Autoprovisioning a Virtual Chassis Fabric*
- *Preprovisioning a Virtual Chassis Fabric*
- *Adding a Device to a Virtual Chassis Fabric*
- *Configuring a QFX Series Virtual Chassis (CLI Procedure)*

- *Example: Configuring an EX4200 Virtual Chassis Using a Preprovisioned Configuration File*
- *Example: Setting Up a Full Mesh EX8200 Virtual Chassis with Two EX8200 Switches and Redundant XRE200 External Routing Engines*
- *Configuring an EX3300 Virtual Chassis (CLI Procedure)*
- *Configuring an EX4200, EX4500, or EX4550 Virtual Chassis (CLI Procedure)*
- *Configuring an EX8200 Virtual Chassis (CLI Procedure)*
- *Configuring an EX9200 Virtual Chassis*
- *Configuring a QFX Series Virtual Chassis (CLI Procedure)*

memory-enhanced

Syntax

```
memory-enhanced {
  filter;
  route;
  vpn-label;
}
```

Hierarchy Level [edit chassis]

Release Information Statement added in Junos OS Release 10.4.

Description Allocate more jtree memory for routing tables and Layer 3 VPNs.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 362

minor

Syntax

```
minor {
  threshold threshold-value;
  action {
    alarm;
    disable-pfe;
    log;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* error]

Release Information Statement introduced for PTX Series routers in Junos OS Release 13.3.

Description Configure minor FPC error levels.

The statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- Configuring FPC Error Levels and Actions on PTX Series Routers on page 267

minimum-quality

Syntax minimum-quality;

Hierarchy Level [edit chassis synchronization output interfaces external]
[edit chassis synchronization output interfaces (external-0/0 | external-1/0)]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the minimum quality level threshold to select a clock source (see Table 11 on page 151). If the quality level of the output clock source drops below the configured minimum quality level threshold, the external output clock is suppressed on the external output interface—external—on SCBE and on the external output interfaces—external-0/0 and external-1/0—on SCBE2.

Table 36: Quality Levels

Quality Level	Description
prc	Timing quality of a primary reference clock (option-1 only).
prs	Clock traceable to a primary reference source (option-2 only).
sec	Timing quality of an SDH equipment clock (option-1 only).
smc	Clock traceable to a self-timed SONET (option-2 only).
ssu-a	Timing quality of a type I or IV slave clock (option-1 only).
ssu-b	Timing quality of a type VI slave clock (option-1 only).
st2	Clock traceable to Stratum 2 (option-2 only).
st3	Clock traceable to Stratum 3 (option-2 only).
st3e	Clock traceable to Stratum 3E (option-2 only).
st4	Clock traceable to Stratum 4 free-run (option-2 only).
stu	Clock traceable to an unknown quality (option-2 only).
tnc	Clock traceable to a transit node clock (option-2 only).

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- synchronization on page 581

mlfr-uni-nni-bundles

Syntax mlfr-uni-nni-bundles *number*;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure link services management properties.

Options *number*—Number of Multilink Frame Relay user-to-network interface network-to-network interface (UNI-NNI) (FRF.16) bundles to allocate on a Link Services PIC.

Range: 1 through 255

Default: 16

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support the Link Services PIC on page 280

mixed-rate-mode

Syntax mixed-rate-mode;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* mixed-rate-mode],
[edit chassis *lcc number* fpc *slot-number* pic *pic-number* mixed-rate-mode] (Routing Matrix)

Release Information Statement introduced in Junos OS Release 13.3.

Description Configure the mixed-rate mode for the 24-port 10 Gigabit Ethernet PIC (PF-24XGE-SFPP) only.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Modes of Operation of 10-Gigabit Ethernet PICs*
- Configuring Mixed-Rate Mode Operation on page 285

multiservice

Syntax

```
multiservice {
  source-mac;
  destination-mac;
  payload {
    ip {
      layer-3 (source-ip-only | destination-ip-only);
      layer-4;
    }
  }
  symmetric-hash {
    complement;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* hash-key family]

Release Information Statement introduced in Junos OS Release 9.6.

Description (MX Series 3D Universal Edge Routers only) Configure data used in a hash key for the **multiservice** protocol family when configuring PIC-level symmetrical hashing for load balancing on an 802.3ad Link Aggregation Group.

Options

destination-mac—Include destination MAC address in the hash key.

payload—Include payload data in the hash key. This option has the following suboptions:

- **layer-3**—Include Layer 3 IP information in the hash key.
- **layer-4**—Include Layer 4 IP information in the hash key.

source-mac—Include source MAC address in the hash key.

symmetric-hash—Create a symmetric hash or symmetric hash complement key with any attribute.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 237

network-option

Syntax network-option (option-1 | option-2);

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in Junos OS Release 11.2R4 for MX Series routers.

Description Configure the Ethernet equipment clock (EEC) synchronization networking type.

NOTE: For SCB, this option is set with the **set chassis synchronization network-type (option-1 | option-2)** configuration command at the **[edit]** hierarchy level.

NOTE: For Junos OS releases 11.2R4 through 13.3R3 for MX240, MX480, and MX960 with SCB, SCBE, and SCBE2; and MX2010 and MX2020 with SCB or SCBE; you must execute the following commands after you change the network option at the **[edit chassis synchronization]** hierarchy level. This is because the loop bandwidth does not change automatically when you change the network option.

```
user@host# deactivate chassis synchronization
user@host# activate chassis synchronization
```

Options Depending on the configuration of the Synchronization Status Messages (SSM) quality level, the network option functions in the following ways:

- **option-1**—Maps to the G.813 option 1 (EEC1).
- **option-2**—Maps to the G.812 type IV clock (EEC1).

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- synchronization on page 581

network-services

Syntax network-services (ethernet | enhanced-ethernet | ip | enhanced-ip | lan);

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 8.5.
Options **enhanced-ethernet** and **enhanced-ip** introduced in Junos OS Release 11.4.

Description Set the router's network services to a specific mode of operation.

Options

ethernet—Set the router's network services to Ethernet and use standard, compiled firewall filter format.

enhanced-ethernet—Set the router's network services to enhanced Ethernet and use enhanced mode capabilities. Only MPCs and MS-DPCs are powered on in the chassis.

ip—Set the router's network services to Internet Protocol and use standard, compiled firewall filter format.

enhanced-ip—Set the router's network services to enhanced Internet Protocol and use enhanced mode capabilities. Only MPCs and MS-DPCs are powered on in the chassis. Non-service DPCs do not work with enhanced network services mode options.

lan—Set the router's network services to LAN and use standard, compiled firewall filter format. Reboot the system after setting the router's network services to LAN.

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.

NOTE: Whenever tunnel interfaces -pe/-pd are created using the MS-DPC instead of the MPC, the interface will not be able to process register messages. The MS-MPC and the MS-DPC have different multicast architecture and they are incompatible if the chassis is configured to "enhanced-ip" mode.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Network Services Mode Overview on page 167
- *Firewall Filters and Enhanced Network Services Mode Overview*
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 254

- *Configuring Enhanced IP Network Services for a Virtual Chassis*

no-concatenate

Syntax no-concatenate;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number*] (Routing Matrix)

Release Information Statement introduced before Junos OS Release 7.4.

Description Do not concatenate (multiplex) the output of a SONET/SDH PIC (an interface with a name **so-*fpc/pic/port***).

When configuring and displaying information about interfaces that are operating in channelized mode, you must specify the channel number in the interface name (***physical:channel***); for example, **so-2/2/0:0** and **so-2/2/0:1**.

On SONET OC48 interfaces that are configured for channelized (multiplexed) mode, the **bytes e1-quiet** and **bytes f1** options in the **sonet-options** statement have no effect. The **bytes f2**, **bytes z3**, **bytes z4**, and **path-trace** options work correctly on channel 0. They work in the transmit direction only on channels 1, 2, and 3.

Default Output is concatenated (multiplexed).

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 277

no-multi-rate

Syntax no-multi-rate;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced in Junos OS Release 11.2.

Description Disable the rate-selectability configuration. This statement is supported only on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP.

Default Rate-selectability is enabled.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Configuring a Port Speed on page 286

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.

Related Documentation

- Example: Configuring Packet Forwarding Engine FIB Localization on page 194

non-revertive (Chassis)

Syntax non-revertive;

Hierarchy Level [edit chassis aggregated-devices ethernet lacp link-protection]

Release Information Statement introduced in Junos OS Release 9.3.
Statement introduced in Junos OS Release 11.4 for EX Series switches.

Description Disable the ability to switch to a better priority link (if one is available) once a link is established as active and a collection or distribution is enabled.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 291
- *Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)*

number-of-ports

Syntax number-of-ports *active-ports*;

Hierarchy Level [edit chassis fpc *slot-number*]
[edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced in Junos OS Release 10.1 for 16x10GE 3D MPC.
Support for MPC3, MPC4, MPC5, and MPC6 introduced in Junos OS Release 13.3R2.

Description Administratively disable 8 or 12 physical ports, for example to prevent the router from ever being oversubscribed. By default, all available ports are enabled. When disabled, the LED on the affected card will appear yellow.

Options *active-ports*—Specify the number of ports (8 or 12) to enable or disable.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Number of Active Ports on MX Series Routers on page 239

offline

Syntax offline;

Hierarchy Level [edit chassis lcc *number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description (Routing matrix based on the TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, configure a T640 router so that it is not part of the routing matrix. On a TX Matrix Plus router, configure a T1600 or T4000 router so that it is not part of the routing matrix.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- **online-expected on page 538**
- TX Matrix Router and T640 Router Configuration Overview on page 173
- TX Matrix Plus Router Configuration Overview on page 178
- Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 191
- Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 206

offline-on-fabric-bandwidth-reduction

Syntax offline-on-fabric-bandwidth-reduction;

Hierarchy Level [edit chassis fpc *slot-number*]

Release Information Statement introduced in Junos OS Release 11.4.

Description Configure an FPC with degraded fabric bandwidth offline, to avoid causing a traffic black hole in the chassis for an extended time.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Disabling an FPC with Degraded Fabric Bandwidth on page 361
- Traffic Black Hole Caused by Fabric Degradation on page 351

on-disk-failure (Chassis Routing Engine)

Syntax

```
on-disk-failure {
  disk-failure-action (halt | reboot);
}
```

Hierarchy Level [edit chassis routing-engine]

Release Information Statement introduced before JUNOS Release 7.4.
The **disk-failure-action** statement added in JUNOS Release 9.0.

Description Instruct the router to halt or reboot if it detects hard disk errors on the Routing Engine.

Options The remaining statement is explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 365

on-error

Syntax

```
on-error {
  raise-alarm;
  power (cycle | off);
  write-coredump;
}
```

Hierarchy Level

[edit chassis fpc *slot-number* sanity-poll]
[edit chassis lcc *number* fpc *number* sanity-poll] (Routing Matrix)

Release Information Statement introduced in Junos OS Release 11.4.

Description Instruct the FPC to perform actions during an error condition.

Options

raise-alarm—Generate and display a chassis alarm in case of an error.

power cycle—Reboot the FPC after generating a core file. This statement is useful in case of temporary software errors that are eliminated after reboot.

power off—Halt the FPC and keep it offline. This statement is useful in case of permanent hardware failures.

CAUTION: The **power off** statement halts the FPC. Ensure that you have backup paths through different FPC to avoid service outage.

NOTE: The **power cycle** and **power off** statements are mutually exclusive: You can configure either the **power cycle** or the **power off** statement for an error.

write-coredump—Trigger the core file in case of an error.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Sanity Polling for FPCs on T Series Routers on page 367
- **sanity-poll on page 566**
- **retry-count on page 562**

online-expected

Syntax online-expected;

Hierarchy Level [edit chassis lcc *number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description (TX Matrix and TX Matrix Plus routing matrix only) On a TX Matrix router, configure a T640 router so that if it does not come online, an alarm is sent to the TX Matrix router. On a TX Matrix Plus router, configure a T1600 or a T4000 router so that if it does not come online, an alarm is sent to the TX Matrix Plus router.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- TX Matrix Router and T640 Router Configuration Overview on page 173
- TX Matrix Plus Router Configuration Overview on page 178
- Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 191
- Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 206
- **offline on page 535**

oss-map

Syntax

```
oss-map {
  model-name t640|t1600;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 12.3R3, 13.1R2, and 13.2R1 for T4000 routers.

Description Configure the operations support systems (OSS) mapping feature to map a T4000 chassis to a T1600 chassis or a T640 chassis, so that the T4000 chassis is represented as a T1600 chassis or a T640 chassis, respectively. The configuration helps prevent requalifying the T1600 chassis and T640 chassis as a new chassis on the OSS.

Options

model-name t640—Perform OSS mapping on a T4000 chassis to represent it as a T640 chassis, thereby overriding the chassis model name as displayed in the output of the **show chassis hardware**, the **show snmp mib walk system**, and the **show snmp mib walk jnxBoxAnatomy** operational commands.

model-name t1600—Perform OSS mapping on a T4000 chassis to represent it as a T1600 chassis, thereby overriding the chassis model name as displayed in the output of the **show chassis hardware**, the **show snmp mib walk system**, and the **show snmp mib walk jnxBoxAnatomy** operational commands.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 264
- Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 445
- **show chassis oss-map on page 1447**
- Understanding Operations Support Systems Mapping on page 26

output interfaces external

Syntax

```
output {
  interfaces {
    external {
      holdover-mode-disable;
      minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
      source-mode (chassis | line); tx-dnu-to-line-source-enable;
      tx-dnu-to-line-source-enable;
      wander-filter-disable;
    }
  }
}
```

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the options for the external clock output interface—external—on SCBE.

Configure the options for the external clock output interfaces—external-0/0 and external-1/0—on SCBE2.

Options The statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

packet-scheduling

Syntax (packet-scheduling | no-packet-scheduling);

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 7.4.

Description (M 160 routers only) Enable packet-scheduling mode, in which the Packet Director application-specific integrated circuit (ASIC) schedules packet dispatches to compensate for transport delay differences. This preserves the interpacket gaps as the packets are distributed from the Packet Director ASIC to the Packet Forwarding Engine.

Default **no-packet-scheduling**

NOTE: The packet-scheduling feature is available on M160 routers only.

Options **no-packet-scheduling**—Do not schedule packets.

packet-scheduling—Schedule packets to preserve interpacket gaps.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable an M160 Router to Operate in Packet Scheduling Mode on page 230

payload

Syntax

```
payload {
  ip {
    layer-3;
    layer-4;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* hash-key family multiservice]

Release Information Statement introduced in Junos OS Release 9.6.

Description (MX Series 3D Universal Edge Routers only) Include payload data in a hash key for the **multiservice** protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.

Options **ip**—Include IPv4 payload data in the hash key. This option has the following suboptions:

- **layer-3**—Include Layer 3 IP information in the hash key.
- **layer-4**—Include Layer 4 IP information in the hash key.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 237

pem (M320 Routers)

Syntax

```
pem {
  minimum number;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 7.4.

Description Configure the minimum number of Power Entry Modules (PEMs) on an M320 router. With this configuration, PEM absent alarms are generated only if the PEM count falls below the minimum specified.

Options **minimum *number***—Minimum number of PEMs on the router.

Range: 0 through 3

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 234
- sib on page 569

pem (T640, T1600, and T4000 Routers with Six-Input DC Power Supply)

Syntax

```
pem {
  feeds number-of-input-feeds;
  input-current amps-in-each-feed;
}
```

Hierarchy Level

[edit chassis]
[edit chassis lcc *lcc-number*] (Routing Matrix)

Release Information

Statement introduced in Junos OS Release 12.1.
Option **feeds** introduced in Junos OS Release 12.1.
Option **input-current** introduced for T4000 routers in Junos OS Release 12.3.

Description

Configure the power supply parameters of the six-input DC power supply on T640, T1600, or T4000 routers.

Options

feeds ***number-of-input-feeds***—Number of input feeds connected to the six-input DC power supply.

(For T4000 routers only) **input-current** ***amps-in-each-feed***—Input current (in amperes) in each feed.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Six-Input DC Power Supply on page 375

pic (M Series and T Series Routers)

Syntax

```
pic pic-number {
  ce1 {
    e1 port-number {
      channel-group group-number timeslots slot-number;
    }
  }
  ct3 {
    port port-number {
      t1 link-number {
        channel-group group-number timeslots slot-number;
      }
    }
  }
  framing (sdh | sonet);
  idle-cell format {
    itu-t;
    payload-pattern payload-pattern-byte;
  }
  inline-services {
    bandwidth (1g | 10g);
  }
  max-queues-per-interface (8 | 4);
  no-concatenate;
}
```

Hierarchy Level [edit chassis fpc *slot-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure properties for an individual PIC.

Options *pic-number*—Slot number in which the PIC is installed.

Range: 0 through 3

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 271
- Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 277
- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 299
- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 278

pic (MX Series Routers)

Syntax

```
pic pic-number {
  account-layer2-overhead;
  adaptive-services {
    (layer-2 | layer-3);
  }
  aggregate-ports;
  ce1 {
    e1 port-number {
      channel-group group-number timeslots slot-number;
    }
  }
  channelization;
  ct3 {
    port port-number {
      t1 link-number {
        channel-group group-number timeslots slot-number;
      }
    }
  }
  egress-policer-overhead bytes;
  framing (sdh | sonet);
  idle-cell format {
    itu-t;
    payload-pattern payload-pattern-byte;
  }
  ingress-policer-overhead bytes;
  inline-services {
    bandwidth (1g | 10g);
  }
  max-queues-per-interface (8 | 4);
  mlfr-uni-nni-bundles number;
  mlfr-uni-nni-bundles-inline number;
  multi-link-layer-2-inline;
  no-concatenate;
  no-multi-rate;
  pic-type OID of PIC type;
  sparse-dlcis;
  tunnel-services (Chassis) {
    bandwidth (1g | 10g | 20g | 40g);
    tunnel-only;
  }
  vtmapping (klm | itu-t);
}
```

Hierarchy Level [edit chassis fpc *slot-number*]

Release Information Statement introduced before Junos OS Release 7.4.

multi-link-layer-2-inline and **mlfr-uni-nni-bundles-inline** options introduced in Junos OS Release 14.1.

Description Configure properties for an individual PIC.

Options ***pic-number***—Slot number in which the PIC is installed.

Range: 0 through 3

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 271
- Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 277
- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 299
- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 278
- *Enabling Inline Service Interfaces*

pic (TX Matrix and TX Matrix Plus Routers)

Syntax

```
pic pic-number {
  aggregate-ports;
  atm-cell-relay-accumulation;
  atm-l2circuit-mode (cell | aal5 | trunk trunk);
  egress-policer-overhead (count);
  framing (sdh | sonet);
  idle-cell-format {
    itu-t;
    payload-pattern payload-pattern-byte;
  }
  ingress-policer-overhead (count);
  max-queues-per-interface (8 | 4);
  no-concatenate;
  no-mcast-replication;
  q-pic-large-buffer (large-scale | small-scale);
}
```

Hierarchy Level [edit chassis lcc *number* fpc *slot-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description On a TX Matrix or TX Matrix Plus router, configure properties for an individual PIC.

Options *pic-number*—Slot number in which the PIC is installed.

Range: 0 through 3

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- TX Matrix Router and T640 Router Configuration Overview on page 173
- TX Matrix Plus Router Configuration Overview on page 178
- Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 271

policer-drop-probability-low

Syntax policer-drop-probability-low;

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 11.4R1.

Description Reduces the possibility that policers configured on the router might drop packets. For some Juniper Networks routers, policers can mark packets as out-of-specification in accordance with TCP. By default, these policers begin to randomly drop packets when the current credit exceeds the credit limit. In the context of TCP, this random drop mechanism helps to smooth the flow of traffic. The **policer-drop-probability-low** statement causes the policers to operate as strict rate limiters and to ignore the standard TCP behavior.

The **policer-drop-probability-low** statement is applicable to the following routing platforms:

- M7i
- M10i
- M120
- M320
- MX Series

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *show pfe cfeb*
- *show pfe feb*
- *show pfe fpc*

port (Chassis)

Syntax port *port-number*;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* ct3]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the channelized T3 port number on the PIC.

Options ***port-number***—Port number.

Range: 0 through 1

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 299

port auxiliary time-of-day-format

Syntax port auxiliary time-of-day-format ascii *string*;

Hierarchy Level [edit chassis synchronization source interfaces (external-a | external-b | interface *interface-name*)]
[edit chassis synchronization source interfaces (external | interface *interface-name*)]
[edit chassis synchronization source interfaces (external-0/0 | external-1/0 | interface *interface-name*)]

Release Information Statement introduced in Junos OS Release 13.3 for MX Series routers.

Description Configure the time-of-day message format as ASCII on the auxiliary port that receives the external clock signals.

Options ***string***—Set the message format in ASCII characters.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization (MX Series) on page 581

power

Syntax power (off | on);

Hierarchy Level [edit chassis fpc *slot-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the Flexible PIC Concentrator (FPC) to stay offline or to come online automatically.

Default **on**

Options **off**—Take the FPC offline, and configure it to stay offline, as, for example, after a system reboot.

on—Bring the FPC online, and configure it to come online automatically, as, for example, after a system reboot.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 269

priority1

Syntax priority1 *priority1-value*;

Hierarchy Level [edit protocols ptp]

Release Information Statement introduced in Junos OS Release 12.2.
Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.

Description Configure the priority as one of the following:

- In the slave, the priority value is set to select the best master clock. Note that in order to select a particular master clock, the priority value in the master clock's announce message must be equal to or lower than the configured *priority1-value*.
- In the master, the priority value is set to represent itself in the announce message to other slaves.
- In the boundary node, the slave uses this value to determine the best master clock, whereas the master uses this value from the announce message of the selected master clock.

Note that the lower value takes precedence.

Options ***priority1-value***—The priority value of the clock.

Range: 0 through 255

Default: 128

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Precision Time Protocol Overview on page 143
- *IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers*

priority2

Syntax
priority2 *priority2-value*;

Hierarchy Level
[edit protocols ptp]

Release Information
Statement introduced in Junos OS Release 12.2.
Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.

Description
Configure the **priority2** value. This value is used to differentiate and prioritize the master clocks to avoid confusion when the ***priority1-value*** is the same for different master clocks in a network.

Note that the lower value takes precedence.

Options
priority2-value—The priority value of the clock.

Range: 0 through 255

Default: 128

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143
- *IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers*

priority (Clock Synchronization)

Syntax priority *number*;

Hierarchy Level [edit chassis synchronization source interfaces (external-a | external-b | interface *interface-name*)]
[edit chassis synchronization source interfaces (external | interface *interface-name*)]
[edit chassis synchronization source interfaces (external-0/0 | external-1/0 | interface *interface-name*)]

Release Information Statement introduced in Junos OS Release 11.2R4 for MX Series routers.

Description Configure the priority of a clock source in relationship to other clock sources to define a network synchronization flow and to help prevent timing loops.

When the priority is not specified, the external-a interface has higher default priority than the external-b interface, and the external-b interface has higher default priority than other Gigabit Ethernet or 10-Gigabit Ethernet clock sources, which have the lowest default priority. Any priority you configure is higher than any default priority.

Options *number*—Set the priority level of the clock source.

Range: 1 through 5

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- synchronization on page 581

pulse-per-second-enable

Syntax pulse-per-second-enable;

Hierarchy Level [edit chassis synchronization interfaces external]
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the external interface to receive the pulse per second (PPS) signal on the GPS interface of the router.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- synchronization on page 581

q-pic-large-buffer

Syntax q-pic-large-buffer (large-scale | small-scale);

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]
[edit chassis lcc *number* fpc *slot-number* pic *pic-number* (Routing Matrix)

Release Information Statement introduced in Junos OS Release 7.4.
Support for TX Matrix and TX Matrix Plus hierarchy added in Junos OS Release 9.6.

Description Configure delay buffers.

NOTE: When you commit the configuration after including the **q-pic-large-buffer** statement for a PIC, the Junos OS temporarily takes the PIC offline and brings it back online before the new configuration is activated and becomes the current operational configuration.

Default **small-scale**

Options **large-scale**—(Optional) Set the average packet size used to calculate the number of notification queue entries in the IQ PIC to 256 bytes. Useful for slower interfaces (T1, E1, and *N*xDS0 interfaces configured on Channelized IQ PICs and Gigabit Ethernet VLANs configured on Gigabit Ethernet IQ PICs).

small-scale—(Optional) Set the average packet size used to calculate the number of notification queue entries in the IQ PIC to 40 bytes.

NOTE: You cannot configure the **large-scale** and the **small-scale** options on MX Series routers. Include only the **q-pic-large-buffer** statement to enable the large delay buffer size on Enhanced Queuing DPCs on MX Series routers.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 282
- *Configuring Schedulers*

quality-level (Clock Synchronization)

Syntax quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);

Hierarchy Level [edit chassis synchronization source interfaces (external-a | external-b | interface *interface-name*)]
[edit chassis synchronization source interfaces (external | interface *interface-name*)]
[edit chassis synchronization source interfaces (external-0/0 | external-1/0 | interface *interface-name*)]

Release Information Statement introduced in Junos OS Release 11.2R4 for MX Series routers.

Description Configure the quality level for a timing source so that the router knows the best available source with which to synchronize. The quality level specifies the accuracy level of the clock and is transmitted across the network through Synchronization Status Messages (SSMs) over the Ethernet Synchronization Messaging Channel (ESMC), or through SSMs contained in SONET/SDH frames.

SONET SSM messages are either Generation 1 or Generation 2. Generation 1 is the first and most widely deployed SSM message set. Generation 2 is a newer version. Quality level options are available for both Generation 1 and Generation 2.

Options prs—Primary reference source—Stratum 1

st2—Stratum 2

tnc—Transit node clock

st3e—Stratum 3E

st3—Stratum 3

smc—SONET minimum clock

st4—Stratum 4

prc—Primary reference clock

ssu-a—Synchronization supply unit A

ssu-b—Synchronization supply unit B

sec—SDH equipment clock

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

quality-level (hybrid)

Syntax quality-level (prs | st2 | tnc | st3e | st3 | smc | st4) | (prc | ssu-a | ssu-b | sec);

Hierarchy Level [edit protocols ptp slave clock-class-to-quality-level-mapping]

Release Information Statement introduced in Junos OS Release 12.2R2.

Description Configure the quality level for the timing source so that the router knows the best available source with which to synchronize. The quality level specifies the accuracy level of the clock.

Options **prs** —Primary reference source—Stratum 1

st2—Stratum 2

tnc—Transit node clock

st3e—Stratum 3E

st3—Stratum 3

smc—SONET minimum clock

st4—Stratum 4

prc—Primary reference clock

ssu-a—Synchronization supply unit A

ssu-b—Synchronization supply unit B

sec—SDH equipment clock

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 338
- Understanding Hybrid Mode on page 164
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133

quality-mode-enable

Syntax quality-mode-enable;

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in Junos OS Release 11.2R4 for MX Series routers.

Description Enable Synchronous Ethernet ESMC quality mode. The quality level parameter for a Synchronous Ethernet interface is optional when quality mode is enabled and the selection mode is set to the **received-quality** value.

The default quality level for a Synchronous Ethernet interface is based on the value of network option: The **option-1** statement, when set, selects the **sec** quality level; and the **option-2** statement, when set, selects the **st3** quality level.

Table 37 on page 558 shows whether SSM quality level is supported for a given external interface signal type and framing. The default setting is disabled.

Table 37: SSM-Quality LevelSupport by Signal Type and Framing

Signal Type	Framing	SSM Quality Level Supported
E1	G.704	yes
E1	G.704 no CRC4	no
T1	ESF	yes
T1	SF	no
2048 KHz	Not applicable	no

Default By default, this statement is disabled.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

recovered-clock

Syntax

```
recovered-clock {
  port port-number;
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.

Description Select the port where the synchronous clock may be recovered.

Options *port-number*—Port number where the synchronous clock may be recovered.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Clock Sources for PTX Series Packet Transport Routers on page 317
- Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Routers on page 318
- **synchronization on page 579**

red-buffer-occupancy

Syntax

```
red-buffer-occupancy {
  weighted-averaged [ instant-usage-weight-exponent exponent-value ];
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number*]

Release Information Statement introduced in Junos OS Release 8.3.

Description Configure the IQ PIC to base random early detection (RED) queue management on a *simple moving average* buffer occupancy calculation. If you do not include this statement, the IQ PIC bases RED on an *instantaneous* buffer occupancy value. As an option, you can specify that the IQ PIC bases RED on a *weighted moving average* of buffer occupancy values.

If you configure this feature on a channelized OC12 intelligent queuing (IQ) PIC, the PIC reboots.

Options

weighted-averaged—Configure the IQ PIC to base RED processing on a simple moving average of instantaneous buffer occupancy values instead of an instantaneous buffer occupancy.

instant-usage-weight-exponent *exponent-value*—(Optional) Specify the integer to be used as the negative exponent of 2 to express a weight value. The PIC performs weighted RED (WRED) by based on a calculation of average buffer occupancy that applies the specified weight value to the instantaneous buffer occupancy and then factors the weighted value into the calculation of average buffer occupancy. Valid exponent range is from 1 through 31 (weight values from 2^{-1} through 2^{-31}). If you do not specify this option, the default exponent value is 0, which results in a weight value of $2^{0} = 1$. With a weight value of 1, the calculation of weighted average buffer occupancy yields the same value as the simple average buffer occupancy.

NOTE: You can specify an exponent value greater than 31, and the value displays in the output of show commands. However, the PIC replaces the out-of-range value with the *operational* value of 31, which results in a weight value of $2^{-31} = 1 / 2^{31}$ = 0.0000000004656612873077392578125.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring Weighted RED Buffer Occupancy*
- *Example: Configuring Weighted RED Buffer Occupancy*

redundancy-mode

Syntax redundancy-mode (increased-bandwidth | redundant)

Hierarchy Level [edit chassis fabric]

Release Information Statement introduced in Junos OS Release 12.2.

Description (MX240, MX480, and MX960 routers only) Configure the active control boards to be in redundancy mode or increased fabric bandwidth mode. In increased fabric bandwidth mode, which is the default behavior for MX Series routers with Switch Control Board (SCB), the maximum number of available fabric planes are used. The MX Series routers that contain the Enhanced SCB—SCBE—and the MPC3E, the control boards operate in redundancy fabric mode (all the FPCs use 4 fabric planes as active planes) by default.

Options **increased-bandwidth**—Enable increased fabric bandwidth mode for the control boards, which causes all the available fabric planes to be used.

redundant—Enable redundancy mode for the control boards, which causes all the FPCs to use 4 fabric planes as active planes.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 358
- Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 353
- Corrective Actions for Fabric Failures on MX Series Routers on page 356
- Router Chassis Configuration Statements on page 454
- **show chassis fabric redundancy-mode on page 1124**
- Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 361

request (Clock Synchronization)

Syntax request (force-switch lockout);

Hierarchy Level [edit chassis synchronization source interfaces (external-a | external-b | interface *interface-name*)]
[edit chassis synchronization source interfaces (external | interface *interface-name*)]
[edit chassis synchronization source interfaces (external-0/0 | external-1/0 | interface *interface-name*)]

Release Information Statement introduced in Junos OS Release 11.2 R4 for MX Series routers.

Description Specify the clock selection request criterion.

Options **force-switch**—Force switching to a clock source, provided the clock source is enabled and not locked out. Only one configured source may be force-switched.

lockout—Clock source is not considered by the selection process. Lockout may be configured for any source.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 579

retry-count

Syntax retry-count *number;*

Hierarchy Level [edit chassis fpc *slot-number* sanity-poll]
[edit chassis lcc *number* fpc *number* sanity-poll] (Routing Matrix)
[edit chassis cluster redundancy-group *group-number* ip-monitoring]

Release Information Statement introduced in Junos OS Release 11.4.

Description Number of times sanity polling periodically checks for an error condition in the FPC.

Options *number*—Number of times sanity polling is allowed to check for an error condition.

Range: 1 through 30

Default: 10

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Sanity Polling for FPCs on T Series Routers on page 367
- sanity-poll on page 566
- on-error on page 537

route (chassis)

Syntax route;

Hierarchy Level [edit chassis memory-enhanced]

Release Information Statement added in Junos OS Release 10.4.

Description Allocate more jtree memory for routing tables over firewall filters.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 362

routing-engine (Chassis)

Syntax

```
routing-engine {
  on-disk-failure {
    disk-failure-action (halt | reboot);
  }
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 7.4.
The **disk-failure-action** statement added in Junos OS Release 9.0.

Description Configure a Routing Engine to halt or reboot automatically when a hard disk error occurs. A hard disk error may cause a Routing Engine to enter a state in which it responds to local pings and interfaces remain up, but no other processes are responding. Rebooting or halting prevents this.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 365

route-localization

Syntax

```
route-localization {
  inet;
  inet6;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 11.4.

Description Configure FIB localization for IPv4 and IPv6 routes.

Options **inet**—Configure FIB localization for IPv4 routes.

inet6—Configure FIB localization for IPv6 routes.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Packet Forwarding Engine FIB Localization on page 194

sabit

Syntax sabit *bit*;

Hierarchy Level [edit chassis synchronization interfaces external e1-options]
[edit chassis synchronization interfaces (external-0/0 | external-1/0) e1-options]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the SA bit for exchanging the SSM quality on the E1 interface.

Options ***bit***—SA bit value.

Range: 4 through 8.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

sampling-instance

Syntax

sampling-instance *instance-name*;

Hierarchy Level

[edit chassis fpc *slot-number*],
[edit chassis lcc *number* fpc *slot-number*] (Routing Matrix),
[edit chassis member *member-number* fpc slot *slot-number*]

Release Information

Statement introduced in Junos OS Release 9.6.
Support at the **[edit chassis member *member-number* fpc slot *slot-number*]** hierarchy level introduced in Junos OS Release 14.1.
Statement introduced in Junos OS Release 14.1R3 for EX Series switches.

Description

Associate a defined sampling instance with a specific FPC, MPC, or DPC for active sampling instances configured at the **[edit forwarding-options sampling]** hierarchy level.

For M120 routers with FEB, this statement must also be configured under **[edit chassis feb *slot-number*]**, in addition to the **[edit forwarding-options sampling]** hierarchy level.

In a two-member MX Series Virtual Chassis, the master router (member 0) uses FPC slot numbers 0 through 11 with no offset; the backup router (member 1) uses FPC slot numbers 12 through 23, with an offset of 12.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC on page 365
- *Inline Flow Monitoring for Virtual Chassis Overview*
- *Junos Services Interfaces Configuration Guide*

sanity-poll

Syntax

```
sanity-poll {
  retry-count number;
  on-error {
    raise-alarm;
    power (cycle | off);
    write-coredump;
  }
}
```

Hierarchy Level

[edit chassis fpc *slot-number*]
[edit chassis lcc *number* fpc *number*] (Routing Matrix)

Release Information

Statement introduced in Junos OS Release 11.4.

Description

Enable sanity polling and start periodic sanity checking for a particular FPC. The periodic sanity check includes checking for error conditions such as “register sanity issues,” “high temperature,” “hardware failure,” and so on in the FPC.

NOTE: Currently, periodic sanity check is performed only on the routing chip register.

Options

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Sanity Polling for FPCs on T Series Routers on page 367
- retry-count on page 562
- on-error on page 537

selection-mode

Syntax selection-mode (configured-quality | received-quality);

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in Junos OS Release 11.2R4 for MX Series routers.

Description Specify whether the clock source selection must use the configured or the received ESMC or SSM quality level for a qualifying interface. In both the selection modes, the interface qualifies for clock source selection only when the received ESMC or SSM quality level on the interface is equal to or greater than the configured ESMC or SSM quality level for the interface.

Options **configured-quality**—Set this option to let the clock source selection algorithm to use the ESMC or SSM quality level that is configured for a qualifying interface.

received-quality—Set this option to let the clock source selection algorithm to use the ESMC or SSM quality level that is received on the qualifying interface.

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.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

service-package

Syntax service-package (layer-2 | layer-3);

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* adaptive-services]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced on MX Series 3D Universal Edge Routers with MS-DPCs in Junos OS Release 9.6.

Description For adaptive services interfaces, enable a service package on the specified Physical Interface Card (PIC).

Default layer-3

Options **layer-2**—Enable a Layer 2 service package on the specified PIC.

layer-3—Enable a Layer 3 service package on the specified PIC.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 305
- Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 253
- *Junos Services Interfaces Configuration Guide*

session-offload

Syntax session-offload;

Hierarchy Level [edit chassis fpc *slot-number* pic *number* adaptive-services service-package extension-provider]

Release Information Statement introduced on MX Series 3D Universal Edge Routers with MS-DPCs in Junos OS Release 9.6.

Description Enable session offloading on a per-PIC basis for a Multiservices PIC.

Default Session offloading is disabled.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Enable Session Offloading on MX Series 3D Universal Edge Routers with MS-DPCs on page 254

sfm (Chassis)

Syntax sfm *slot-number* power off;

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 7.4.

Description For routers with SFMs, configure an SFM to stay offline.

By default, if you use the **request chassis sfm** CLI command to take an SFM offline, the SFM will attempt to restart when you enter a **commit** CLI command. To prevent a restart, configure an SFM to stay offline. This feature is useful for repair situations. The SFM remains offline until you delete this statement.

Options *slot-number*—Slot number in which the SFM is installed.

power off—Take the SFM offline and configure it to remain offline.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Make an SFM Stay Offline on page 230
- *High Availability Feature Guide for Routing Devices*

sib

Syntax

```
sib {
  minimum number;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 7.4.

Description Configure the minimum number of SIBs on an M320 router. With this configuration, SIB absent alarms are generated only if the SIB count falls below the minimum specified.

Options *number*—Minimum number of SIBs on the router.

Range: 0 through 3

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 234
- **pem on page 543**

signal-type

Syntax signal-type (1hz | 5mhz | 10mhz | 2048mhz | e1 | t1);

Hierarchy Level [edit chassis synchronization interfaces external]
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the frequency for the provided reference clock.

Options

1mhz—Set the signal with a clock frequency of 1 MHz.

5mhz—Set the signal with a clock frequency of 5 MHz.

10mhz—Set the signal with a clock frequency of 10 MHz.

2048khz—Set the signal with a clock frequency of 2048 kHz.

e1—Set the signal as an E1-coded 2048-kHz signal on a 120-ohm balanced line.

t1—Set the signal as a T1-coded 1.544-MHz signal on a 100-ohm balanced line.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

switchover-mode

Syntax switchover-mode (non-revertive | revertive);

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in Junos OS Release 11.2R4 for MX Series routers.

Description Specify whether the router must switch from a lower-quality clock source to a higher-quality clock source or use the current clock source only.

Default revertive

Options **non-revertive**—Set this option so that the router continues to use the current clock source as long as it is valid.

revertive—Set the option so that the router automatically switches from a lower to a higher quality clock source whenever the higher clock source becomes available.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- synchronization on page 581

slow-pfe-alarm

Syntax slow-pfe-alarm;

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 12.1R6, 12.2R5, 12.3R3, 13.1R2, and 13.2R1.

Description Enable the slow Packet Forwarding Engine alarm on a M Series, MX Series, or a T Series router.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- Configuring Slow Packet Forwarding Engine Alarm on page 369

sonet

Syntax

```
sonet {
  device-count number;
}
```

Hierarchy Level [edit chassis aggregated-devices]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure properties for SONET/SDH aggregated devices on the router.

Options The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 291

slave

Syntax

```
slave {
  announce-interval announce-interval-value
  announce-timeout announce-timeout-value;
  delay-request delay-request-value;
  frequency-only;
  interface interface-name {
    unicast-mode {
      transport ipv4;
      clock-source ip-address {
        local-ip-address local-ip-address {
      }
    }
  }
  sync-interval interval;
}
```

Hierarchy Level [edit protocols ptp]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the slave with parameters.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

source-mode

Syntax source-mode (chassis | line);

Hierarchy Level [edit chassis synchronization output interfaces external]
[edit chassis synchronization output interfaces (external-0/0 | external-1/0)]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the source mode for selecting a clock source as either a chassis clock or the best line clock source as output for the configured BITS interface.

Options **chassis**—Set the chassis clock for output.

line—Set the best line clock source for output.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

source interfaces

Syntax

```
source interfaces (external | interface-name)
  priority number;
  quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
  request (force-switch | lockout);
  wait-to-restore minutes;
}
```

Hierarchy Level [edit chassis synchronization]

Release Information Statement introduced in JJunos OS Release 11.2R4 for MX Series routers.

Description Configure the clock source that is used by the clock selection process on an interface.

- (SCB only) Specify the primary clock source as the external-a interface and the secondary clock source as the external-b interface. The clock source is chosen using the clock selection process.
- (SCBE only) Specify the external interface to select the external clock source.
- (SCBE2 only) Specify the external-0/0 interface or the external-1/0 interface to select the external clock source.

Options The statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 579

sparse-dlcis

Syntax sparse-dlcis;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*];

Release Information Statement introduced before Junos OS Release 7.4.

Description Support a full data-link connection identifier (DLCI) range (1 through 1022). This enables you to use circuit cross-connect (CCC) and translation cross-connect (TCC) features by means of Frame Relay on T1 and E1 interfaces.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 276

speed

Syntax speed (oc3-stm1 | oc12-stm4 | oc48-stm16);

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* port *port-number*]

Release Information Statement introduced in Junos OS Release 11.2.

Description Configure the port speed. This statement is supported only on the SONET/SDH (Multi-Rate) MICs with SFP, the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, and ATM MICs.

Default **oc3-stm1**

Options **oc3-stm1**—OC3 or STM1.

oc12-stm4—OC12 or STM4.

oc48-stm16—OC48 or STM16.

NOTE: You can configure the **oc12-stm4**, **oc3-stm1**, and **oc48-stm16** port speed options for SONET/SDH OC3/STM1 (Multi-Rate) MICs. However, for Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP and ATM MICs, you can configure only the **oc12-stm4** and **oc3-stm1** port speed options.

Also, for ATM MICs, you can configure the **oc12-stm4** port speed option only for ports 0 and 4. If you configure the **oc12-stm4** port speed option for port 0, then ports 1,2, and 3 are disabled. Similarly, if you configure the **oc12-stm4** port speed for port 4, then ports 5,6, and 7 are disabled.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Configuring a Port Speed on page 286

speed (24-port and 12-port 10 Gigabit Ethernet PIC)

Syntax speed 1G | 10G

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* port *port-number*]
[edit chassis *lcc number* fpc *slot-number* pic *pic-number* mixed-rate-mode] (Routing Matrix)

Release Information Statement introduced in Junos OS Release 13.3.

Description Configure the port speed on PF-24XGE-SFPP or the PF-12XGE-SFPP PIC on a T4000 standalone router or on an LCC in a TX Matrix Plus routing matrix with 3D SIBs.

NOTE: To change the port speed from 10 Gbps to 1 Gbps on PF-24XGE-SFPP and PF-12XGE-SFPP PICs, SFP optics is required.

Options **1 G**—1 Gbps

10 G—10 Gbps

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Modes of Operation of 10-Gigabit Ethernet PICs*
- Configuring Mixed-Rate Mode Operation on page 285
- mixed-rate-mode on page 529

symmetric-hash

Syntax

```
symmetric-hash {
  complement;
}
```

Hierarchy Level [edit chassis fpc slot-number pic slot-number hash-key family inet],
[edit chassis fpc slot-number pic slot-number hash-key family multiservice]

Release Information Statement introduced in Junos OS Release 9.6.

Description (MX Series 3D Universal Edge Routers only) Configure the symmetric hash or symmetric hash complement at the PIC level for configuring symmetrical load balancing on an 802.3ad Link Aggregation Group.

Options **complement**—Include the complement of the symmetric hash in the hash key.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 237

sync-interval

Syntax sync-interval *sync-interval-value*;

Hierarchy Level [edit protocols ptp master]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the logarithmic mean interval for sync interval messages to be sent by the master. By default, 64 sync interval messages are sent per second.

Options ***sync-interval-value***—The sync interval value for sync interval messages to be sent by the master.

Range: –6 through +6

Default: 0

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

synchronization (M Series, T Series, and PTX Series)

Syntax

```
synchronization {
  primary (external-a | external-b | fpc-slot-number | gps-0-10mhz | gps-0-5mhz |
    gps-1-10mhz | gps-1-5mhz | bits-a | bits-b);
  secondary (external-a | external-b | fpc-slot-number | gps-0-10mhz | gps-0-5mhz |
    gps-1-10mhz | gps-1-5mhz | bits-a | bits-b );
  signal-type (t1 | e1);
  switching-mode (revertive | non-revertive);
  transmitter-enable;
  validation-interval seconds;
  y-cable-line-termination;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 7.6.
Statement introduced in Junos OS Release 9.3 for M120 routers.
Statement introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers.
Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.

Description (M320, M40e, M120, T320, T640, and T1600 routers and PTX Series Packet Transport Routers only) Configure an external synchronization interface to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to that source.

Options **primary**—First external timing source specified in the configuration hierarchy. This statement has the following suboptions:

- **external-a**—Use **external-a** as the primary clock synchronization source.
- **external-b**—Use **external-b** as the primary clock synchronization source.
- **fpc-*slot-number***—Use **fpc-*slot-number*** as the primary clock synchronization source. For the PTX5000 Packet Transport Router, replace *slot-number* with a value from **0** through **7**.
- **gps-0-10mhz**—Use **gps-0-10mhz** as the primary clock synchronization source.
- **gps-0-5mhz**—Use **gps-0-5mhz** as the primary clock synchronization source.
- **gps-1-10mhz**—Use **gps-1-10mhz** as the primary clock synchronization source.
- **gps-1-5mhz**—Use **gps-1-5mhz** as the primary clock synchronization source.
- **bits-a**—Use **bits-a** as the primary clock synchronization source.
- **bits-b**—Use **bits-b** as the primary clock synchronization source.

secondary—Second external timing source specified in the configuration hierarchy.

- **external-a**—Use **external-a** as the secondary clock synchronization source.
- **external-b**—Use **external-b** as the secondary clock synchronization source.

- **fpc-*slot-number***—Use **fpc-*slot-number*** as the secondary clock synchronization source. For the PTX5000 Packet Transport Router, replace *slot-number* with a value from **0** to **7**.
- **gps-0-10mhz**—Use**gps-0-10mhz** as the secondary clock synchronization source.
- **gps-0-5mhz**—Use **gps-0-5mhz** as the secondary clock synchronization source.
- **gps-1-10mhz**—Use **gps-1-10mhz** as the secondary clock synchronization source.
- **gps-1-5mhz**—Use **gps-1-5mhz** as the secondary clock synchronization source.
- **bits-a**—Use **bits-a** as the secondary clock synchronization source.
- **bits-b**—Use **bits-b** as the secondary clock synchronization source.

signal-type—Specify the line encoding mode for interfaces: either **t1** or **e1**. For the M40e router, only the **t1 signal-type** mode is supported.

Default: **t1**

switching-mode—Specify **revertive** if a lower-priority synchronization can be switched to a valid, higher-priority synchronization.

Default: **non-revertive**

transmitter-enable—(M320 routers only) Control whether the diagnostic timing signal is transmitted.

validation-interval—Validate the synchronized deviation. If revertive switching is enabled and a higher-priority clock is validated, the clock module is directed to the higher-priority clock, and all configured and active synchronizations are validated. The validation timer resumes after the current validation interval expires. This feature is not supported on PTX Series Packet Transport Routers.

Range: (M320, M40e, T320, T640, T1600 routers) 90 through 86,400 seconds. (M120 routers) 30 through 86,400 seconds.

Default: (M320, M40e, T320, T640, T1600 routers) 90 seconds. (M120 routers) 30 seconds

y-cable-line-termination—(M320 routers only) Specify that a single signal be wired to both Control Boards (CBs) using a Y-cable.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 307

synchronization (MX Series)

Syntax

```
synchronization {
  clock-mode (auto-select | free-run);
  esmc-transmit {
    interfaces (all | interface-name);
  }
  hold-interval {
    configuration-change seconds;
    restart seconds;
    switchover seconds;
  }
  interfaces {
    external | (external-0/0 | external-1/0) {
      e1-options {
        framing (g704 | g704-no-crc4);
        line-encoding (ami | hdb3);
        sabit number;
      }
      pulse-per-second-enable;
      signal-type (2048khz | e1 | t1);
      t1-options {
        framing (esf | sf);
        line-encoding (ami | b8zs);
      }
    }
  }
  max-transmit-quality-level quality-level
  network-option (option-1 | option-2);
  output {
    interfaces (external | (external-0/0 | external-1/0)) {
      holdover-mode-disable;
      minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
      source-mode (chassis | line);
      tx-dnu-to-line-source-enable;
      wander-filter-disable;
    }
  }
  port auxiliary client {
    time-of-day-format {
    ascii <string>;
    }
  }
  quality-mode-enable;
  selection-mode (configured-quality | received-quality);
  source {
    interfaces (interface-name | (external | (external-0/0 | external-1/0)) {
      priority number;
      quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
      request (force-switch | lockout);
    }
  }
  switchover-mode (revertive | non-revertive);
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 10.4.
Options **interfaces**, **output**, and **source interfaces external** introduced in Junos OS Release 12.3.

Description (MX5-T, MX10-T, MX40-T, MX80-T, MX240, MX480, and MX960 routers) Configure Synchronous Ethernet parameters. For configuration details, see “Configuring Clock Synchronization Interface on MX Series Routers” on page 309.

(MX240, MX480, MX960, and MX2020 routers with SCBE or SCBE2) Configure centralized clocking parameters.

- Starting in Junos 12.2, configure distribution of the selected chassis clock source to downstream network elements through supported line interfaces.
- Starting in Junos 12.3, configure an external building-integrated timing supply (BITS) timing source. You can also configure the selected chassis clock, or an incoming Synchronous Ethernet or PTP line source for transmission out the external interface.

For configuration details, see “Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board” on page 428.

NOTE: Unified ISSU is not supported when clock synchronization is configured for Synchronous Ethernet.

Options **clock-mode (auto-select | free-run)**—Specify the mode of operation to select the clock source either from a free-run local oscillator or from an external qualified clock. On MX240, MX480, and MX960 routers with enhanced MPCs, the free-run clock is provided by a local oscillator. On other MX Series routers, the free-run clock is provided by the SCB. The default setting is auto-select mode.

esmc-transmit interfaces (all | *interface-name*)—Enable Ethernet Synchronization Message Channel (ESMC) packet transmission.

hold-interval (configuration-change | restart | switchover) *seconds*—Specify the chassis synchronization hold interval type and clock selection wait time:

- **configuration-change**—Clock select wait time after change in configuration. The range is 15 through 60 seconds. The default is ???
- **restart**— Clock select wait time after reboot. The range is 60 through 180 seconds. The default is 120 seconds.
- **switchover**— Switchover wait time after clock recovery. The range is 30 to 60 seconds. The default is 30 seconds.

interfaces (external | (external-0/0 | external-1/0))—Configure the external interface for operating with a connected external device. This interface can be configured as a clock source, which then becomes a candidate for selection as the chassis clock source by the clock source selection algorithm.

- **signal-type (1mhz | 5mhz | 10mhz | 2048khz | e1 | t1)**—Specify the external interface signal type:
  a. **1mhz**—Set the signal with a clock frequency of 1 MHz.
  b. **5mhz**—Set the signal with a clock frequency of 5 MHz.
  c. **10mhz**—Set the signal with a clock frequency of 10 MHz.
  d. **2048khz**—Set the signal with a clock frequency of 2048 kHz.
  e. **e1**—Set the signal as an E1-coded 2048 kHz signal on a 120-ohm balanced line.
  f. **t1**—Set the signal as a T1-coded 1.544 MHz signal on a 100-ohm balanced line.
- **e1-options**—Specify the E1 options:
  a. **framing (g704 | g704-no-crc4)**—Specify the framing format:
     - **g704**—G.704 framing format for E1 interfaces
     - **g704-no-crc4**—G.704 framing with no CRC4 for E1 interfaces
  b. **line-encoding (ami | hdb3)**—Specify the line encoding:
     - **ami**— Alternate mark inversion (AMI)
     - **hdb3**—High-d Density bipolar 3 code (HDB3)
  c. **sabit *number***—Specify the San synchronization status bit used for exchanging SSN quality. The value can be 4, 5, 6, 7, or 8. The default is 4.

- **t1-options**—Specify the T1 options:
  a. **framing (esf | sf)**—Specify the framing format:
     - **esf**—Extended superframe (ESF)
     - **sf**—Superframe (SF)
  b. **line-encoding (ami | b8zs)**—Specify the line encoding:
     - **ami**— Alternate mark inversion (AMI)
     - **b8zs**—8-bit zero suppression, bipolar with 8-zero substitution (B8ZS)

max-transmit-quality-level—Specify the threshold quality level for the entire system. If the received quality level is below the threshold quality level then the router will send out a received quality level of SEC. The available quality levels are **PRC**, **PRS**, **SEC**, **SMC**, **SSU-A SSU-B ST2**, **ST3**, **ST3E**, **ST4**, **STU**, and **TNC**.

network-option (option-1 | option-2)—Specify the synchronization networking:

- **option-1**— EEC-1 maps to G.813 option 1 clock
- **option-2**—EEC-2 maps to G.812 type IV clock

output interfaces external—(SCBE only) Specify the properties of the external output interface:

output interfaces (external-0/0 | external-1/0)—(SCBE2 only) Specify the properties of the external output interface:

- **holdover-mode-disable**—Disable holdover.
- **minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc)**—Specify the minimum quality level threshold for selection of this clock (see Table 11 on page 151). If the quality level of the output clock source drops below the configured minimum quality level threshold, the external output clock is squelched.

Table 38: Quality Levels

Quality Level	Description
prc	Timing quality of a primary reference clock (option-1 only).
prs	Clock traceable to a primary reference source (option-2 only).
sec	Timing quality of an SDH equipment clock (option-1 only).
smc	Clock traceable to a self-timed SONET (option-2 only).
ssu-a	Timing quality of a type I or IV slave clock (option-1 only).
ssu-b	Timing quality of a type VI slave clock (option-1 only).
st2	Clock traceable to Stratum 2 (option-2 only).
st3	Clock traceable to Stratum 3 (option-2 only).
st3e	Clock traceable to Stratum 3E (option-2 only).
st4	Clock traceable to Stratum 4 free-run (option-2 only).
stu	Clock traceable to an unknown quality (option-2 only).
tnc	Clock traceable to a transit node clock (option-2 only).

- **source-mode (chassis | line)**—Specify source mode for selecting source to output:
  a. **chassis**—Chassis clock for output
  b. **line**—Best line clock source for output
- **tx-dnu-to-line-source-enable**—Set Tx quality level to DNU/DUS on line source interface that has been selected as the external output source.
- **wander-filter-disable**—Disable wander filtering.

quality-mode-enable—Specify the clock selection, quality level, and priority setting. The quality level parameter for a Synchronous Ethernet interface is optional when quality mode is enabled and the selection mode is set to **received-quality**. The default quality level for a Synchronous Ethernet interface is based on the value of **network-option**: **option-1** selects **SEC** and **option-2** selects **ST3**. Table 37 on page 558 shows whether SSM quality level is supported for a given external interface signal type and framing. The default setting is disabled.

Table 39: SSM-Quality Level Support by Signal Type and Framing

Signal Type	Framing	SSM Quality Level Supported
E1	G.704	yes
E1	G.704 no CRC4	no
T1	ESF	yes
T1	SF	no
2048 KHz	Not applicable	no

selection-mode (configured-quality | received-quality)—Specify whether the clock source selection should use the configured or received ESMC or SSM quality level for a qualifying interface. In both selection modes, the interface qualifies for clock source selection only when the received ESMC or SSM quality level on the interface is equal to or greater than the configured ESMC or SSM quality level for the interface.

NOTE: For the **selection-mode** statement configuration to take effect, you must set the **quality-mode-enable** statement at the **[edit chassis synchronization]** hierarchy level.

a. **configured-quality**—The clock source selection algorithm uses the ESMC or SSM quality level configured for a qualifying interface.

b. **received-quality**—The clock source selection algorithm uses the ESMC or SSM quality level received on the qualifying interface.

source (external-a | external-b | interfaces (*interface-name*) | external | (external-0/0 | external-1/0))—Specify clock sources.

(SCB only) The primary clock source is external-a interface, the secondary clock source is external-b interface. The clock source is chosen using the clock selection process.

(SCBE only) Specify the external interface to select the external clock source.

(SCBE2 only) Specify the external-0/0 interface or external-1/0 interface to select the external clock source.

- **priority** ***number***—Specify a priority level from 1 to 5. When not specified, **external-a** has higher default priority than external-b interface , and external-b interface has higher default priority than other Gigabit Ethernet or 10-Gigabit Ethernet clock sources, which have the lowest default priority. Any priority you configure is higher than any default priority.
- **quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc)**—Specify the **quality-level** option based on the configured **network-option**. For quality level details, see Table 11 on page 151.

NOTE: Starting with Junos OS Release 12.2R1, the **quality-level** parameter for a Synchronous Ethernet interface is optional when quality mode is enabled and the selection mode is set to received quality. The default quality level for a Synchronous Ethernet interface is **SEC** for the **option-1** network type and **ST3** for the **option-2** network type.

Both option I and option II SSM quality levels are supported:

- For option-1, quality level must be configured for external clocks (**external-a** or **external-b**) whether or not quality level is enabled.
- For option-2, the default quality level for external clocks is QL_STU whether or not quality level is enabled.
- Quality level is set to DNU for network-option 1 and set to DUS for network-option 2, if quality-level is not configured and no ESMC messages are received.
- On the selected active source (primary or secondary, whichever is active), even if ESMC transmit is not enabled, a DNU ESMC will be sent out if **network-option** is 1, and DUS ESMC will be sent out if **network-option** is 2. This is applicable only for sources of Ethernet interface type to avoid source looping.

- **request force-switch**—Force a switch to this source if the source is enabled and not locked out. You can configure only one source to be force-switched.
- **request lockout**—You can configure lockout for any source. When configured, this source is not considered by the clock selection process.

switchover-mode (revertive | non-revertive)—Specify revertive or non-revertive switchover mode:

- In revertive mode (the default), the system switches from a lower to a higher quality clock source whenever the higher quality clock source becomes available.
- In non-revertive mode, the system continues to use the current clock source as long as it is valid.

port auxiliary time-of-day-format ascii *string*—Specify time of day (TOD) format as a string of ASCII characters.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Synchronous Ethernet Overview on page 133
- **show chassis synchronization (MX Series Routers) on page 1550**
- Configuring Clock Synchronization Interface on MX Series Routers on page 309
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 324
- Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board on page 428
- Example: Configuring Centralized Clocking on an MX2020 on page 437
- **request chassis synchronization mode on page 670**
- Clock Sources for PTX Series Packet Transport Routers on page 317

synchronous-ethernet-mapping

Syntax

```
synchronous-ethernet-mapping {
  clock-source ip-address {
    interface interface1-name;
    interface interface2-name;
  }
}
```

Hierarchy Level [edit protocols ptp slave hybrid]

Release Information Statement introduced in Junos OS Release 12.2R2.

Description Configure the Synchronous Ethernet mapping for hybrid mode.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 335
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 338
- Understanding Hybrid Mode on page 164
- Precision Time Protocol Overview on page 143
- Synchronous Ethernet Overview on page 133

system-priority

Syntax system-priority *priority*;

Hierarchy Level [edit chassis aggregated-devices ethernet lacp]

Release Information Statement introduced in Junos OS Release 9.3.
Statement introduced in Junos OS Release 11.4 for EX Series switches.

Description Define LACP system priority for aggregated Ethernet interfaces at the global (chassis) level.

The device with the lower system priority value determines which links between LACP partner devices are active and which are in standby for each LACP group. The device on the controlling end of the link uses port priorities to determine which ports are bundled into the aggregated bundle and which ports are put in standby mode. Port priorities on the other device (the noncontrolling end of the link) are ignored. In priority comparisons, numerically lower values have higher priority. Therefore, the system with the numerically lower value (higher priority value) for LACP system priority becomes the controlling system. If both devices have the same LACP system priority (for example, they are both configured with the default setting of 127), the device MAC address determines which switch is in control.

Options *priority*—Priority for the aggregated Ethernet system. A smaller value indicates a higher priority.

Range: 0 through 65535

Default: 127

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 291
- *Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)*

t1

Syntax

```
t1 link-number {
  channel-group channel-number timeslots slot-number;
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* ct3 port *port-number*];

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure channelized T1 port and channel specifications.

Options *link-number*—T1 link.

Range: 0 through 27 for DS0 naming

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 299

t1-options

Syntax

```
t1-options {
  framing (esf | sf);
  line-encoding (ami | b8zs);
}
```

Hierarchy Level [edit chassis synchronization interfaces external]
[edit chassis synchronization interfaces (external-0/0 | external-1/0) e1-options]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the T1 interface options.

Options The statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

threshold

Syntax threshold *threshold-value*;

Hierarchy Level [edit chassis fpc *slot-number* error fatal], [edit chassis fpc *slot-number* error major], [edit chassis fpc *slot-number* error minor]

Release Information Statement introduced for PTX Series routers in Junos OS Release 13.3.

Description Configure the error count at which to take action.

Default By default, the error count for fatal and major actions is 1. The default error count for minor actions is 10.

Options *number*—Specify the threshold of error counts at which to take action.

Range: 0 through 4,294,967,295

Required Privilege Level interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Related Documentation

- Traffic Black Hole Caused by Fabric Degradation on page 351
- Configuring FPC Error Levels and Actions on PTX Series Routers on page 267

traffic-manager

List of Syntax

Syntax (MX Series, T Series) on page 593
Syntax (M Series) on page 593

Syntax (MX Series, T Series)

```
traffic-manager {
  egress-shaping-overhead number;
  ingress-shaping-overhead number;
  mode {
    egress-only;
    ingress-and-egress;
  }
}
```

Syntax (M Series)

```
traffic-manager {
  egress-shaping-overheadnumber;
  ingress-shaping-overhead number;
  mode {
    egress-only;
    ingress-and-egress;
    session-shaping;
  }
}
```

Hierarchy Level

[edit chassis fpc *slot-number* pic *pic-number*],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number*] (Routing Matrix)

Release Information

Statement introduced in Junos OS Release 8.3.

Description

Enable CoS queuing, scheduling, and shaping on an L2TP session.

NOTE: Committing changes to **traffic-manager** automatically restarts any necessary components (PICs, DPCs, or FPCs).

Options

egress-shaping-overhead ***number***—When traffic management (queueing and scheduling) is configured on the egress side, the number of CoS shaping overhead bytes to add to the packets on the egress interface.

Replace ***number*** with a value from **-63** through **192** bytes.

NOTE: The L2 headers (DA/SA + VLAN tags) are automatically a part of the shaping calculation.

ingress-shaping-overhead ***number***—When L2TP session shaping is configured, the number of CoS shaping overhead bytes to add to the packets on the ingress side of the L2TP tunnel to determine the shaped session packet length.

When session shaping is not configured and traffic management (queueing and scheduling) is configured on the ingress side, the number of CoS shaping overhead bytes to add to the packets on the ingress interface.

Replace ***number*** with a value from **—63** through **192** bytes.

mode—Configure CoS traffic manager mode of operation. This option has the following suboptions:

- **egress-only**—Enable CoS queuing and scheduling on the egress side for the PIC that houses the interface. This is the default mode for an Enhanced Queueing (EQ) DPC on MX Series routers.

NOTE: If ingress packet drops are observed at a high rate for an IQ2 or IQ2E PIC, configure the **traffic-manager** statement to work in the **egress-only** mode.

- **ingress-and-egress**—Enable CoS queueing and scheduling on both the egress and ingress sides for the PIC. This is the default mode for IQ2 and IQ2E PICs on M Series and T Series routers.

NOTE:
- For EQ DPCs, you must configure the **traffic-manager** statement with **ingress-and-egress** mode to enable ingress CoS on the EQ DPC.
- EQ DPCs have 250 ms of buffering, with only egress queueing (default mode). When **ingress-and-egress** is configured, the buffer is partitioned as 50 ms for the ingress direction and 200 ms for the egress direction.

- **session-shaping**—(M Series routers only) Configure the IQ2 PIC mode for session-aware traffic shaping to enable L2TP session shaping.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Configuring CoS for L2TP Tunnels on ATM Interfaces*
- *egress-shaping-overhead*
- *ingress-shaping-overhead*
- *mode (Layer 2 Tunneling Protocol Shaping)*

transport (slave)

Syntax transport ipv4;

Hierarchy Level [edit protocols ptp slave interface *interface-name* unicast-mode]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the encapsulation type for Precision Time Protocol (PTP) packet transport . Currently, IPv4 is the only supported encapsulation type for PTP.

The remaining statements are explained separately.

Options **IPv4**—The encapsulation type for Precision Time Protocol packet transport as IPv4.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

transport (master)

Syntax transport ipv4;

Hierarchy Level [edit protocols ptp master interface *interface-name* unicast-mode]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the encapsulation type for Precision Time Protocol packet transport. Currently, IPv4 is the only supported encapsulation type for PTP.

The remaining statements are explained separately.

Options **IPv4**—The encapsulation type for Precision Time Protocol packet transport as IPv4.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

transport-type

Syntax transport-type *type*;

Hierarchy Level [edit services hosted-services server-profile *server-profile-name*]

Release Information Statement introduced in Junos OS Release 13.2.

Description Configure the transport type.

Options *type*—Transport type.

Range: GRE, TCP, or UDP

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring Active Flow Monitoring on PTX Series Packet Transport Routers*

tunnel-services (Chassis)

Syntax

```
tunnel-services {
  bandwidth (1g | 10g | 20g | 40g);
  tunnel-only;
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *number*]

Release Information Statement introduced in Junos OS Release 8.2.

Description For MX Series 3D Universal Edge Routers, configure the amount of bandwidth for tunnel services.

For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, configure support for per unit scheduling for GRE tunnels. You can specify the IQ2 and IQ2E PICs to work exclusively in tunnel mode or as a regular PIC. The default setting uses IQ2 and IQ2E PICs as a regular PIC. If you do not configure the **tunnel-only** option, the IQ2 and IQ2 PICs operate as regular PICs. For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, you can use the **tunnel-only** option to specify that an IQ2 or IQ2E PIC work in tunnel mode only.

NOTE: **Bandwidth rates of 20 gigabits per second and 40 gigabits per second require use of an MX Series router with the 100-Gigabit Ethernet Modular Port Concentrator (MPC) and the 100-Gigabit CFP MIC.**

Options **tunnel–only** (Optional)—For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, specify that an IQ2 or IQ2E PIC work in tunnel mode only.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 423
- Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 424
- Example: Configuring Tunnel Interfaces on the MPC3E on page 424
- **bandwidth (Tunnel Services) on page 467**
- *[edit chassis] Hierarchy Level*
- *Configuring Layer 3 Tunnel Services Interfaces on an MX Series Router with a DPC*

tx-dnu-to-line-source-enable

Syntax tx-dnu-to-line-source-enable;

Hierarchy Level [edit chassis synchronization output interfaces external]
[edit chassis synchronization output interfaces (external-0/0 | external-1/0)]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the transmitting quality level to DNU or DUS on the line source interface that has been selected as the external output source.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- synchronization on page 581

ucode-imem-remap

Syntax ucode-imem-remap;

Hierarchy Level [edit chassis feb slot *number*]

Release Information Statement introduced in Junos OS Release 10.4R2.

Description M120 routers with a single type-1 FPC mapped to an FEB support a microcode remap feature to resolve microcode overflow resulting in bad PIC combinations.

You can enable the microcode remap by using the **ucode-imem-remap** statement at the [**edit chassis feb slot** ***number***] hierarchy level. The default microcode map will continue to be available if the **ucode-imem-remap** statement is not configured.

NOTE: **On M120 routers, the FEB is automatically restarted once the ucode-imem-remap statement is configured and committed.**

Required Privilege Level interfaces—To view this statement in the configuration.
interfaces-control—To add this statement to the configuration.

Related Documentation
- Router Chassis Configuration Statements on page 454

unicast-mode (master)

Syntax

```
unicast-mode {
  transport ipv4;
  clock-client ip-address {
    local-ip-address local-ip-address;
  }
}
```

Hierarchy Level [edit protocols ptp master interface *interface-name*]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the master in unicast mode. You can set this option when PTP unicast mode of messaging is needed.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143

unicast-mode (slave)

Syntax

```
unicast-mode {
  clock-source ip-address {
    local-ip-address local-ip-address;
      asymmetry number;
    }
  }
  transport ipv4;
}
```

Hierarchy Level [edit protocols ptp slave interface *interface-name*]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the slave in unicast mode. You can set this option when PTP unicast mode of messaging is needed.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143
- *IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers*

unicast-negotiation

Syntax unicast-negotiation;

Hierarchy Level [edit protocols ptp]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure unicast negotiation. Unicast negotiation is a method by which the announce, synchronization, and delay response packet rates are negotiated between the master and the slave before a PTP session is established.

NOTE:

When unicast negotiation is enabled, you cannot commit any packet rate–related configuration.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Precision Time Protocol on page 327
- Example: Configuring Precision Time Protocol on page 331
- Precision Time Protocol Overview on page 143
- *IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers*

vpn-label

Syntax vpn-label;

Hierarchy Level [edit chassis memory-enhanced]

Release Information Statement added in Junos OS Release 10.4.

Description Allocate more jtree memory for Layer 3 VPN labels.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 362

vrf-mtu-check

Syntax vrf-mtu-check;

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 11.1 for EX Series switches.

Description On M Series routers (except the M120 and M320 router), T Series routers, and on EX Series 8200 switches, configure path maximum transmission unit (MTU) checks on the outgoing interface for unicast traffic routed on a virtual private network (VPN) routing and forwarding (VRF) instance.

Default Disabled.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring Path MTU Checks for VPNs*
- Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers on page 228

vtmapping

Syntax vtmapping (itu-t | klm);

Hierarchy Level [edit interfaces *interface-name* sonet-options];
[edit chassis fpc *number* pic *number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description For the Channelized STM1 IQ PIC or Channelized STM1 PIC, configure virtual tributary mapping.

For the Channelized STM1 PIC, you configure virtual tributary mapping at the **[edit chassis fpc *number* pic *number*]** hierarchy level.

Options **itu-t**—International Telephony Union standard.

klm—KLM standard.

Default: klm

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring Virtual Tributary Mapping of Channelized STM1 Interfaces*
- Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 301

wander-filter-disable

Syntax wander-filter-disable;

Hierarchy Level [edit chassis synchronization output interfaces external]
[edit chassis synchronization output interfaces (external-0/0 | external-1/0)]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Disable the wander filter on the output interface.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- synchronization on page 581

PART 3

Administration

CHAPTER 27

Administrative Commands

- clear chassis alarms fabric degraded
- clear chassis display message
- clear synchronous-ethernet esmc statistics
- request chassis afeb
- request chassis cb
- request chassis ccg
- request chassis cfeb
- request chassis cip
- request chassis clock master switch
- request chassis fabric fpc
- request chassis fabric guided-cabling disable
- request chassis fabric guided-cabling enable
- request chassis fabric plane
- request chassis feb
- request chassis fpc
- request chassis fpm resync
- request chassis lcc
- request chassis mcs
- request chassis mic
- request chassis optics
- request chassis pcg
- request chassis pic
- request chassis redundancy feb slot
- request chassis routing-engine master
- request chassis scg
- request chassis sfb
- request chassis sfm master switch
- request chassis sfm

- request chassis sib
- request chassis sib f13 train-link-receive slot
- request chassis sib f13 train-link-transmit slot
- request chassis sib optics lcc
- request chassis sib optics sfc
- request chassis sib train-link-receive slot
- request chassis sib train-link-transmit slot
- request chassis spmb restart
- request chassis synchronization mode
- request chassis synchronization switch
- set chassis display message

clear chassis alarms fabric degraded

Syntax (TX Matrix Plus Router with 3D SIBs)

clear chassis alarms fabric degraded lcc *number* fpc *number*

Release Information

Command introduced in Junos OS Release 13.2 for a routing matrix with a TX Matrix Plus routers and 3D SIBs.

Description

Clear the fabric degraded alarm for an FPC.

Options

lcc *number*—Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

fpc *number*—Flexible PIC Concentrator (FPC) slot number. On a TX Matrix Plus router in the TXP-T1600-3D, TXP-T4000-3D, or TXP-Mixed-LCC-3D configuration, specify the number of a T1600 or T4000 router by using the **lcc *number*** option and replace **fpc *number*** with a value from 0 through 7.

Required Privilege Level

clear

Related Documentation

- *show system alarms*

Sample Output

show system alarms (TX Matrix Plus router with 3D SIBs)

```
user@host> show system alarms

sfc0-re0:
--------------------------------------------------------------------------
2 alarms currently active
Alarm time               Class  Description
2013-05-08 18:13:58 UTC  Major  LCC 0 Major Errors
2013-05-08 17:48:46 UTC  Major  LCC 7 Major Errors

lcc0-re1:
--------------------------------------------------------------------------
3 alarms currently active
Alarm time               Class  Description
2013-05-08 17:35:34 UTC  Minor  SIB 3 Not Online
2013-05-08 17:35:34 UTC  Minor  SIB 2 Not Online
2013-05-08 18:19:24 UTC  Major  FPC 5 degraded fabric condition detected


user@host> clear chassis alarms fabric degraded lcc 0 fpc 5
lcc0-re1:
--------------------------------------------------------------------------
```

```
user@host> show system alarms

sfc0-re0:
--------------------------------------------------------------------------
2 alarms currently active
Alarm time               Class  Description
2013-05-08 18:13:58 UTC  Major  LCC 0 Major Errors
2013-05-08 17:48:46 UTC  Major  LCC 7 Major Errors

lcc0-re1:
--------------------------------------------------------------------------
2 alarm currently active
Alarm time               Class  Description
2013-05-08 17:36:34 UTC  Minor  SIB 3 Not Online
2013-05-08 17:36:34 UTC  Minor  SIB 2 Not Online
```

clear chassis display message

List of Syntax

Syntax on page 611
Syntax (TX Matrix Router) on page 611
Syntax (TX Matrix Plus Router) on page 611
Syntax (QFabric Systems) on page 611

Syntax

clear chassis display message

Syntax (TX Matrix Router)

clear chassis display message
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)

clear chassis display message
<lcc *number* | sfc *number*>

Syntax (QFabric Systems)

clear chassis display message
<node-device *name* | interconnect-device *name*>

Release Information

Command introduced in Junos OS Release 7.5.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option for the TX Matrix Plus routers introduced in Junos OS Release 9.6.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

(M40e, M160, M320, T Series routers, EX Series, and QFabric systems only) Clear or stop a text message on the craft interface display, which is on the front of the router or switch or on the LCD panel display on the router or switch. The craft interface alternates the display of text messages with standard craft interface messages, switching between messages every 2 seconds. By default, on both the router and the switch, the text message is displayed for 5 minutes. The craft interface display has four 20-character lines. The LCD panel display has two 16-character lines, and text messages appear only on the second line.

Options

none—Clear or stop a text message on the craft interface display.

interconnect-device *name*—(QFabric systems only) (Optional) On a QFabric system, clear or stop a text message on the LCD panel display on the specified Interconnect device.

lcc *number*—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

node-device *name*—(QFabric systems only) (Optional) On a QFabric system, clear or stop a text message on the LCD panel display on the specified Node device in a Node group.

scc—(TX Matrix routers only) (Optional) Clear or stop a text message on the craft interface on the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Clear or stop a text message on the craft interface on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with 0.

Required Privilege Level clear

Related Documentation

- *Configuring the LCD Panel on EX Series Switches (CLI Procedure)*
- set chassis display message on page 674
- show chassis craft-interface on page 703

List of Sample Output clear chassis display message on page 612

Output Fields See show chassis craft-interface for an explanation of output fields.

Sample Output

clear chassis display message

The following example displays and then clears the text message on the craft interface display:

```
user@host> show chassis craft-interface
Red alarm:     LED off, relay off
Yellow alarm:  LED off, relay off
Host OK LED:   On
Host fail LED: Off
FPCs     0  1  2  3  4  5  6  7
-------------------------------
Green  ..  *..  *  *.
Red    ........
LCD screen:
     +--------------------+
     |NOC contact Dusty   |
     |(888) 526-1234      |
     +--------------------+
```

```
user@host> clear chassis display message
```

```
user@host> show chassis craft-interface
Red alarm:     LED off, relay off
Yellow alarm:  LED off, relay off
```



```
Host OK LED:   On
Host fail LED: Off
FPCs     0  1  2  3  4  5  6  7
-------------------------------
Green  ..  *..  *  *.
Red    ........
LCD screen:
     +--------------------+
     |host                |
     |Up: 0+17:05:47      |
     |                    |
     |Temperature OK      |
     +--------------------+
```

clear synchronous-ethernet esmc statistics

Syntax clear synchronous-ethernet esmc statistics <*interface-name*>

Release Information Command introduced before Junos OS Release 10.4.

Description Clear the ESMC statistics for all the interfaces.

Options ***interface-name***—(Optional) Clear ESMC statistics for the specified interface.

Required Privilege Level clear

Related Documentation

- Example: Configuring Synchronous Ethernet on MX Series Routers on page 320
- Synchronous Ethernet Overview on page 133

List of Sample Output clear synchronous-ethernet esmc statistics on page 614

Sample Output

clear synchronous-ethernet esmc statistics

The following example displays the message after the **clear synchronous-ethernet esmc statistics** command is entered:

```
user@host> clear synchronous-ethernet esmc statistics
Cleared ESMC statistics for all interfaces
```


request chassis afeb

Syntax request chassis afeb (offline | online | restart)

Release Information Command introduced in Junos OS Release 13.2.

Description Control the operation of the compact Forwarding Engine Board (FEB).

Options **offline**—Take the FEB offline.

online—Bring the FEB online.

restart—Restart the FEB.

Required Privilege Level view

Related Documentation

- show chassis afeb on page 682

List of Sample Output request chassis afeb online (MX104 Router) on page 615

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis afeb online (MX104 Router)

```
user@host> request chassis afeb online
AFEB is already online
```

request chassis cb

List of Syntax

Syntax

request chassis cb (offline | online) slot *slot-number*

Syntax (TX Matrix Router)

request chassis cb (offline | online) <slot *slot-number* | lcc *number* slot *cb-slot-number* | scc *number* slot *cb-slot-number*>

Syntax (TX Matrix Plus Router)

request chassis cb (offline | online) <slot *slot-number* | lcc *number* slot *cb-slot-number* | sfc *number* slot *cb-slot-number*>

Syntax (QFabric System)

request chassis cb (offline | online) interconnect-device *name* slot *slot-number*
<interconnect-device *name* slot *slot-number* (offline | online)>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS 9.4 for EX Series switches.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS 11.3 for QFX Series.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

(M120, M320, and MX Series routers and T Series routers, QFabric systems, and EX8200 switches only) Control the operation of the Control Board (CB). For information about the meaning of "CBs" on the switches, see *EX Series Switches Hardware and CLI Terminology Mapping*.

Options

offline—Take the Control Board offline.

NOTE: **On a QFabric system, to bring the backup Control Board on a QFX3008-I Interconnect device offline, issue the request chassis cb slot *backup-slot-number* offline command.**

NOTE: **Only backup Control Board can be turned offline or online. To turn a Control Board offline or to bring it back online, the Routing Engine should be turned offline first.**

online—Bring the Control Board online.

interconnect-device *name*—(QFabric systems only) (Optional) Bring the QFX3008-I Interconnect device Control Board either offline or online:

slot ***slot-number***—Control Board slot number:

- (TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, if you specify the number of the T640 router by using the **lcc** ***number*** option (the recommended method), replace ***cb-slot-number*** with a value from 0 through 1.

  Likewise, on a TX Matrix Plus router, if you specify the number of the T1600 or T4000 router by using the **lcc** ***number*** option (the recommended method), replace ***cb-slot-number*** with a value from 0 through 1.
- M320 router—Replace ***slot-number*** with a value from 0 through 1.
- MX480/MX240 routers—Replace ***slot-number*** with a value from 0 through 1.
- MX960 router—Replace ***slot-number*** with a value from 0 through 2.
- MX2020 and MX2010 routers—Replace ***slot-number*** with 0 or 1.
- EX8208 switch—Replace ***slot-number*** with a value from 0 through 2.
- EX8216 switch—Replace ***slot-number*** with a value from 0 through 1.
- QFabric System—Replace ***slot-number*** with a value from 0 through 1.

lcc ***number***—(TX Matrix, TX Matrix Plus routers only) (Optional) Line-card chassis number. Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

sfc ***number***—(TX Matrix Plus routers only) (Optional) Change the CB status for the TX Matrix Plus router (switch-fabric chassis). Replace ***number*** with 0.

Required Privilege Level

maintenance

Related Documentation

- show chassis environment cb on page 794
- *Understanding Switching Control Board Redundancy*
- *Routing Engine and Switching Control Board Redundancy Configuration Statements*

List of Sample Output

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis cb

```
user@host> request chassis cb offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

request chassis cb interconnect-device (QFabric System)

```
user@switch> request chassis cb interconnect-device interconnect1 offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

request chassis cb (MX2020 Router)

```
user@host> request chassis cb offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

request chassis cb (MX2010 Router)

```
user@host> request chassis cb offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

request chassis ccg

Syntax request chassis ccg (offline | online) slot *slot-number*

Release Information Command introduced in Junos OS 12.1x48 for the PTX5000 Packet Transport Routers.

Description (PTX5000 Packet Transport Routers) Control the operation of the Centralized Clock Generator (CCG).

Options **offline**—Take the CCG offline.

online—Bring the CCG online.

slot *slot-number*—CCG slot number. Replace *slot-number* with a value from 0 through 1.

Required Privilege Level maintenance

Related Documentation

- Clock Sources for PTX Series Packet Transport Routers on page 317
- **show chassis environment ccg on page 812**

List of Sample Output request chassis ccg on page 619

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis ccg

```
user@host> request chassis ccg offline slot 1
CCG 1 is  offline, Backup CCG 0 is now online.
```

request chassis cfeb

Syntax request chassis cfeb (offline | online | restart)

Release Information Command introduced before Junos OS Release 7.4.

Description (M7i and M10i routers only) Control the operation of the Compact Forwarding Engine Board (CFEB).

Options **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 699
- *Configuring CFEB Redundancy on the M10i Router*
- *CFEB Overview*

List of Sample Output request chassis cfeb on page 620

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis cfeb

```
user@host> request chassis cfeb offline
CFEB Offlined
```


request chassis cip

Syntax request chassis cip (offline | online) slot *slot-number*

Release Information Command introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Description (TX Matrix Plus routers only) Control the operation of the Connector Interface Panel (CIP).

Options **offline**—Take the CIP offline.

online—Bring the CIP online.

slot *slot-number*—CIP slot number. Replace ***slot-number*** with a value ranging from 0 through 1.

Required Privilege Level maintenance

Related Documentation

- show chassis cip on page 701
- *Installing a T1600 CIP*
- *Installing a T640 CIP*
- *Installing a TX-CIP*
- *Installing an M320 CIP*
- *Installing the M40e CIP*
- *Installing the T320 CIP*
- *CIP Overview*

List of Sample Output request chassis cip offline slot (TX Matrix Plus Router) on page 621
request chassis cip offline slot (TX Matrix Plus Router) on page 621

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis cip offline slot (TX Matrix Plus Router)

```
user@host > request chassis cip offline slot 0
CIP 0 offline done
```

request chassis cip offline slot (TX Matrix Plus Router)

```
user@host > request chassis cip online slot 0
CIP 0 online done
```

request chassis clock master switch

Syntax request chassis clock master switch

Release Information Command introduced in Junos OS Release 12.1.

Description (PTX Series Packet Transport Routers only) Control which Centralized Clock Generator (CCG) is the master.

Options This command has no options.

Additional Information By default, the CCG in slot 0 (CCG0) is the master and the CCG in slot 1 (CCG1) is the backup. If you use this command to change the master, and then restart the chassis software for any reason, the master reverts to the default setting. To change the default master CCG, include the **ccg** statement at the [**edit chassis redundancy**] hierarchy level in the configuration. For more information, see the *Junos OS Administration Library for Routing Devices*.

The configurations on the two CCGs do not have to be the same, and they are not automatically synchronized. If you configure both CCGs as masters, when the chassis software restarts for any reason, the CCG in slot 0 becomes the master and the one in slot 1 becomes the backup.

The switchover from the primary CCG to the backup CCG is immediate.

Required Privilege Level maintenance

Related Documentation

- show chassis environment on page 719

List of Sample Output request chassis clock master switch on page 622

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis clock master switch

```
user@host> request chassis clock master switch
CCG master switch initiated, use "show chassis environment ccg" to verify
```


request chassis fabric fpc

Syntax request chassis fabric fpc interconnect-device *interconnect-device-name* slot *slot-number* (offline | online)

Release Information Command introduced in Junos OS Release 11.3 for the QFX Series.

Description (QFabric systems only) Set the Interconnect device Flexible PIC Concentrator (FPC) offline or online for the QFabric system. When the FPC is offline, traffic is redirected to other FPCs and is not lost while you remove or install an FPC. After issuing this command, you must issue the request chassis fpc command.

Options **interconnect-device *interconnect-device-name***—Set the Interconnect device containing the FPC you want to bring either offline or online.

slot *slot-number*—Set the specific FPC slot on the Interconnect device.

offline—Set the Interconnect device FPC to offline for removal.

online—Set the Interconnect device FPC to online after installation.

Required Privilege Level admin

Related Documentation

- request chassis fpc on page 631
- *show chassis fabric connectivity*
- *show chassis fabric device*
- *Understanding Interconnect Devices*

List of Sample Output request chassis fabric fpc online on page 623
request chassis fabric fpc offline on page 623

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis fabric fpc online

```
user@qfabric> request chassis fabric fpc interconnect-device IC-YW3781 offline slot 15
Graceful offline of the fabric card has been initiated. Please wait 20 seconds
before offlining or removing the card.
```

request chassis fabric fpc offline

```
user@qfabric> request chassis fabric fpc interconnect-device IC-YW3781 online slot 15
Bring the FPC online by issuing the "request chassis fpc online" command.
```


request chassis fabric guided-cabling disable

Syntax request chassis fabric guided-cabling disable (all-lcc | lcc *lcc-number*)

Release Information Command introduced in Junos OS Release 14.1 for TX Matrix Plus routers with 3D SIBs.

Description Disable the guided cabling operation.

Options **all-lcc**—Disable the guided cabling operation for all the LCCs.

lcc ***lcc-number***—Disable the guided cabling operation for the specified LCC.

Required Privilege Level admin

Related Documentation

- request chassis fabric guided-cabling enable on page 625

List of Sample Output

request chassis fabric guided-cabling disable all-lcc on page 624
request chassis fabric guided-cabling disable lcc 7 on page 624

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis fabric guided-cabling disable all-lcc

```
user@host> request chassis fabric guided-cabling disable all-lcc
Guided Cabling disable initiated
```

request chassis fabric guided-cabling disable lcc 7

```
user@host> request chassis fabric guided-cabling disable lcc 7
Guided Cabling disable initiated
```


request chassis fabric guided-cabling enable

Syntax request chassis fabric guided-cabling enable (plane-by-plane | port-by-port) (all-lcc | lcc *lcc-number*)

Release Information Command introduced in Junos OS Release 14.1 for TX Matrix Plus routers with 3D SIBs.

Description Enable the guided cabling operation by using blinking LEDs on the ports to be connected on the LCC and the SFC.

Options **plane-by-plane**—Enable blinking of **CBL** LEDs for all the unconnected ports on a TXP-F13-3D SIB and a TXP-LCC-3D SIB for a particular fabric plane. After you connect all the cables on a TXP-F13-3D SIB and a TXP-LCC-3D SIB, all **CBL** LEDs blink on the fabric plane that need to be subsequently connected. The operation continues until all the cables are connected for all available fabric planes.

port-by-port—Enable blinking of the **CBL** LED for an unconnected port on a TXP-F13-3D SIB and a TXP-LCC-3D SIB. After you connect the cable to a port on a TXP-F13-3D SIB and a TXP-LCC-3D SIB, the **CBL** LED blinks on the next unconnected port on a TXP-F13-3D SIB and a TXP-LCC-3D SIB.

all-lcc—Enable the guided cabling operation for all the LCCs.

lcc ***lcc-number***—Enable the guided cabling operation for the specified LCC.

Required Privilege Level admin

Related Documentation

- request chassis fabric guided-cabling disable on page 624

List of Sample Output

request chassis fabric guided-cabling enable plane-by-plane all-lcc on page 625
request chassis fabric guided-cabling enable port-by-port all-lcc on page 625
request chassis fabric guided-cabling enable plane-by-plane lcc 7 on page 625
request chassis fabric guided-cabling enable port-by-port lcc 7 on page 626

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis fabric guided-cabling enable plane-by-plane all-lcc

```
user@host> request chassis fabric guided-cabling enable plane-by-plane all-lcc
Guided Cabling enable initiated
```

request chassis fabric guided-cabling enable port-by-port all-lcc

```
user@host> request chassis fabric guided-cabling enable port-by-port all-lcc
Guided Cabling enable initiated
```

request chassis fabric guided-cabling enable plane-by-plane lcc 7

```
user@host> request chassis fabric guided-cabling enable plane-by-plane lcc 7
```

```
Guided Cabling enable initiated
```

request chassis fabric guided-cabling enable port-by-port lcc 7

```
user@host> request chassis fabric guided-cabling enable port-by-port lcc 7
Guided Cabling enable initiated
```

request chassis fabric plane

Syntax request chassis fabric plane *plane-number* (offline | online)

Release Information Command introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.4 for EX Series switches.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description (M120 and MX Series routers and EX8200 switches only) Control the operation of the specified fabric plane.

On an MX480 or MX240 series router, you can configure the active control board for redundancy mode or increased bandwidth mode. When running in increased bandwidth mode, MX series routers with Trio chips and the MPC3E will use all eight active fabric planes.

To take both plane 0 and plane 1 offline on a MX480 and MX240 series routers with one or more MPC4E MICs installed, a X86 Media Service Blade, and/or 100G PFE, and where redundancy-mode is configured for "increased-bandwidth", Juniper recommends taking plane 1 offline before plane 0. Likewise, when the router is configured for increased-bandwidth mode, taking fabric planes 0, 2, 4, and 6 offline can cause the chassis to run in a reduced fabric bandwidth mode. Plane 7 may remain in a "spare" state (as seen in the "show chassis fabric summary" command output) until plane 3 is taken offline and then brought back up.

Options **offline**—Take the fabric plane offline. Use the **request chassis fabric plane *plane-number* offline** command to clear a **FAULT** state on a fabric plane. To bring the fabric plane back online, use the **request chassis fabric plane *plane-number* online** command.

online—Bring the fabric plane online.

plane *plane-number*—Fabric plane number.

- For the M120 router, replace ***plane-number*** with a value from 0 through 3.
- For the MX480 and MX240 routers, replace ***plane-number*** with a value from 0 through 7.
- For the MX2020 and MX2010 routers, replace ***plane-number*** with a value from 0 through 7.
- For the MX960 router, replace ***plane-number*** with a value from 0 through 5.
- For the EX8208 switch, replace ***plane-number*** with a value from 0 through 11.
- For the EX8216 switch, replace ***plane-number*** with a value from 0 through 7.

Required Privilege Level maintenance

Related Documentation

- show chassis fabric plane on page 1077
- show chassis fabric plane-location on page 1119
- show chassis fabric summary on page 1143
- *Fabric Management Overview*

List of Sample Output

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis fabric plane 0 online

```
user@host> request chassis fabric plane 0 online
Online initiated, use “show chassis fabric plane” to verify
```

request chassis fabric plane 0 offline

```
user@host> request chassis fabric plane 0 offline
Offline initiated, use “show chassis fabric plane” to verify
```

request chassis fabric plane 0 online (EX8200 switch)

```
user@host> request chassis fabric plane 0 online

Plane 0 is already active
```

request chassis fabric plane (MX2020 Router)

```
user@host> request chassis fabric plane 2 online
Plane 2 is already active
```

request chassis fabric plane (MX2010 Router)

```
user@host> request chassis fabric plane 4 online
Plane 4 is already active
```


request chassis feb

List of Syntax

Syntax on page 629
Syntax (ACX Series Routers) on page 629

Syntax

request chassis feb (offline | online | restart) slot *slot-number*

Syntax (ACX Series Routers)

request chassis feb restart slot *slot-number*

Release Information

Command introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.

Description

(M120 router only) Control the operation of the specified Forwarding Engine Board (FEB).

(ACX Series routers) Restart the specified FEB.

Options

offline—Take the specified FEB offline.

online—Bring the specified FEB online.

restart—Restart the specified FEB.

slot *slot-number*—FEB slot number. Replace ***slot-number*** with a value from 0 through 5.

Required Privilege Level

maintenance

Related Documentation

- show chassis feb on page 1196
- show chassis fabric feb on page 1015
- show chassis fpc-feb-connectivity on page 1250
- *feb*
- *Understanding Switching Control Board Redundancy*

List of Sample Output

request chassis feb offline slot 0 on page 629
request chassis feb online slot 0 on page 629
request chassis feb restart slot 0 on page 630

Output Fields

When you enter this command, you are provided feedback on the status of your request.

request chassis feb (M120 Router)

request chassis feb offline slot 0

```
user@host> request chassis feb offline slot 0
Offline initiated, use “show chassis feb” to verify
```

request chassis feb online slot 0

```
user@host> request chassis feb online slot 0
```

```
Online initiated, use “show chassis feb” to verify
```

request chassis feb restart slot 0

```
user@host> request chassis feb restart slot 0
Restart initiated, use “show chassis feb” to verify
```

request chassis feb (ACX Series Routers)

```
user@host> request chassis feb restart slot 0
FEB will be restarted NOW.
```


request chassis fpc

List of Syntax

Syntax

request chassis fpc (offline | online | restart) slot *slot-number*

Syntax (TX Matrix and TX Matrix Plus Routers)

request chassis fpc (offline | online | restart) slot *slot-number*
<lcc *number*>

Syntax (MX Series Routers)

request chassis fpc (offline | online | restart) slot *slot-number*
<all-members>
<local>
<member *member-id*>

Syntax (MX2020 3D Universal Edge Routers)

request chassis fpc (offline | online | restart) slot *slot-number*

Syntax (MX2010 3D Universal Edge Routers)

request chassis fpc (offline | online | restart) slot *slot-number*

Syntax (QFabric System)

request chassis fpc
<interconnect-device *name* slot *slot-number* (offline | online)>
<(offline | online) interconnect-device *name* slot *slot-number*>
<slot *slot-number* interconnect-device *name* (offline | online)>

Syntax (PTX Series Packet Transport Routers)

request chassis fpc (offline | online | restart) slot *slot-number*

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS 11.3 for QFX Series.
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

(M20, M40, M40e, M120, M160, M320, MX Series, and T Series routers, QFabric systems, EX Series switches, and PTX Series Packet Transport Routers only) Control the operation of the Flexible PIC Concentrator (FPC). For information about the meaning of “FPCs” on the switches, see *EX Series Switches Hardware and CLI Terminology Mapping*.

NOTE: Beginning in Junos OS Release 12.3, it is possible that FPCs brought offline using the **request chassis fpc slot** ***fpc-slot*** **offline** operational-mode CLI command can come online during a configuration commit or power-supply replacement procedure. As an alternative, use the **set fpc** ***fpc-slot*** **power off** configuration-mode command at the **[edit chassis]** hierarchy level to ensure that the FPCs remain offline.

Options

offline—Take the FPC offline.

online—Bring the FPC online.

interconnect-device ***name***—(QFabric systems only) Bring the Flexible Port Concentrator (FPC) on the QFX3008-I Interconnect device either offline or online:

- (QFabric System) On a QFabric system, specify the name of the QFX3008-I Interconnect device containing the Flexible Port Concentrator (FPC) you want to bring either offline or online.

restart—Restart the FPC.

slot ***slot-number***—FPC slot number:

- M20 router—0 through 3.
- M120 router—0 through 5.
- MX240 router—0 through 2. On the MX240 router, slot-number corresponds to the Dense Port Concentrator (DPC) slot number. If an MPC is installed, slot-number corresponds to the MPC slot number.
- MX480 router—0 through 5. On the MX480 router, slot-number corresponds to the Dense Port Concentrator (DPC) slot number. If an MPC is installed, slot-number corresponds to the MPC slot number.
- MX960 router—0 through 11. On the MX960 router, slot-number corresponds to the Dense Port Concentrator (DPC) slot number. If an MPC is installed, slot-number corresponds to the MPC slot number.
- MX2020 router—0 through 19.
- MX2010 router—0 through 9.
- TX Matrix and TX Matrix Plus routers only—On the TX Matrix router, if you specify the number of the T640 router by using the **lcc** ***number*** option (the recommended method), replace ***slot-number*** with a value from 0 through 7. Otherwise, replace ***slot-number*** with a value from 0 through 31.

  Likewise, on a TX Matrix Plus router, if you specify the number of the T1600 or T4000 router by using the **lcc** ***number*** option (the recommended method), replace ***slot-number*** with a value from 0 through 7. Otherwise, replace ***slot-number*** with a value from 0 through 31. In case of TX Matrix Plus router with 3D SIBs, replace *slot-number* with a value from **0** through **63**. For example, the following commands have the same result:

user@host> **request chassis fpc lcc 1 slot 1 offline**
user@host> **request chassis fpc slot 9 offline**

- Other routers—0 through 7.
- QFabric System—Replace ***slot-number*** with a value from 0 through 2.
- EX Series switches:
  - EX4200 switches in a Virtual Chassis configuration—Replace ***slot-number*** with a value from 0 through 9.
  - EX6210 switches—Replace ***slot-number*** with a value from 0 through 9.

    NOTE: These commands are not supported for slots 4 and 5 when a Switch Fabric and Routing Engine (SRE) module is installed in those slots. These commands are supported for slots 4 and 5 only if a line card is installed in them.

  - EX8208 switches—Replace ***slot-number*** with a value from 0 through 7.
  - EX8216 switches—Replace ***slot-number*** with a value from 0 through 15.
- PTX5000 Packet Transport Router—Replace ***slot-number*** with a value from 0 through 7.

all-members—(MX Series routers only) (Optional) Change FPC status of all members of the Virtual Chassis configuration.

local—(MX Series routers only) (Optional) Change FPC status of the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Change FPC status of the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

lcc *number*—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

Required Privilege Level

maintenance

Related Documentation

- show chassis fpc on page 1212
- show chassis fpc-feb-connectivity on page 1250
- show chassis fabric fpcs on page 1021
- Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 269
- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 289

- *MX960 Flexible PIC Concentrator Description*

List of Sample Output

request chassis fpc on page 634
request chassis fpc (MX Series Routers with Media Services Blade [MSB]) on page 634
request chassis fpc (MX2020 Router) on page 634
request chassis fpc (MX2010 Router) on page 634

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis fpc

```
user@host> request chassis fpc online slot 0
FPC 0 already online
```

request chassis fpc (MX Series Routers with Media Services Blade [MSB])

```
user@host> request chassis fpc slot 0
Possible completions:
  offline              Take FPC offline
  online               Bring FPC online
  restart              Restart FPC
```

request chassis fpc (MX2020 Router)

```
user@host >request chassis fpc online slot 2
FPC 2 already online
```

request chassis fpc (MX2010 Router)

```
user@host >request chassis fpc offline slot 5
Offline initiated, use "show chassis fpc" to verify
```

request chassis fpm resync

List of Syntax

Syntax

```
request chassis fpm resync
```

Syntax (TX Matrix Routers)

request chassis fpm resync (lcc *number* | scc)

Syntax (TX Matrix Plus Routers)

request chassis fpm resync (lcc *number* | sfc *number*)

Syntax (MX Series Routers)

request chassis fpm resync
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

```
request chassis fpm resync
```

Syntax (MX2020 3D Universal Edge Routers)

```
request chassis fpm resync
```

Release Information

Command introduced before Junos OS Release 7.4.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

(M40e, M120, M160, M320, MX Series, and T Series routers only) Resynchronize the craft interface status.

Options

all-members—(MX Series routers only) (Optional) Resynchronize the craft interface status on all members of the Virtual Chassis configuration.

lcc ***number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Resynchronize the craft interface status on the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Resynchronize the craft interface status on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

scc—(TX Matrix routers only) Resynchronize the craft interface status on the TX Matrix router (switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) Resynchronize the craft interface status on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with **0**.

Required Privilege Level maintenance

Related Documentation

- show chassis environment fpm on page 840
- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 289

List of Sample Output request chassis fpm resync on page 636
request chassis fpm resync (MX2010 Router) on page 636

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis fpm resync

```
user@host> request chassis fpm resync
Front Panel resynced
```

request chassis fpm resync (MX2010 Router)

```
user@host > request chassis fpm resync
Front Panel resynced.
```

request chassis lcc

Syntax (TX Matrix and TX Matrix Plus Routers)

request chassis lcc (offline | online) slot *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 LCC that is connected to the TX Matrixrouter. On a TX Matrix Plus router, control the operation of a LCC that is connected to the TX Matrix Plus router.

Options

offline—On a routing matrix based on the TX Matrix router (switch-card chassis), take the T640 router (line-card chassis) offline. On a routing matrix based on a TX Matrix Plus router (switch-fabric chassis), take the router (line-card chassis) offline.

online—On a routing matrix based on the TX Matrix router (switch-card chassis), bring the T640 router (line-card chassis) online. On a routing matrix based on a TX Matrix Plus router (switch-fabric chassis), bring the router (line-card chassis) online.

slot *slot-number*—On a TX Matrix router (switch-card chassis), the slot number of a T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router (switch-fabric chassis), the slot number of a router (line-card chassis) that is connected to the TX Matrix Plus (switch-fabric chassis) router.

slot-number has the following values depending on the LCC configuration

Replace *slot-number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

Required Privilege Level

maintenance

Related Documentation

- show chassis lccs on page 1432
- *Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)*
- *fpc*

List of Sample Output

request chassis lcc on page 638

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis lcc

`user@host>` **request chassis lcc offline slot 0**

request chassis mcs

Syntax request chassis mcs (offline | online | restart) slot *slot-number*

Release Information Command introduced before Junos OS Release 7.4.

Description (M40e and M160 routers only) Control the operation of the Miscellaneous Control Subsystem (MCS).

Options **offline**—Take the MCS offline.

online—Bring the MCS online.

restart—Restart the MCS.

slot ***slot-number***—MCS slot number. Replace ***slot-number*** with 0 or 1.

Required Privilege Level maintenance

Related Documentation

- show chassis environment mcs on page 860

List of Sample Output request chassis mcs on page 639

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis mcs

```
user@host> request chassis mcs online slot 0
MCS 0 appears to be online already
```

request chassis mic

Syntax request chassis mic (offline | online) fpc-slot *slot-number* mic-slot *slot-number*

Release Information Command introduced in Junos OS Release 10.1.
Command introduced in Junos OS Release 12.3 for ACX4000 Series Router.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.

Description (MX Series routers only) Control the operation of the Modular Interface Cards (MICs) installed on a Modular Port Concentrator (MPC).

NOTE: On MX960 routers, if the MIC is not functioning correctly, you should take the MPC offline, replace it with a new MPC, and reinstall the MIC. On MX104 routers, the **request chassis mic** command is not supported on FPC slot 2 and MIC slot 0.

Options **offline**—Take the MIC offline.

online—Bring the MIC online.

fpc-slot *slot-number*—FPC slot number where the MIC is installed:

- ACX4000 router—Replace ***fpc-slot*** with the value **0** or **1**.
- MX80 router—Replace ***fpc-slot*** with the value **1**. This command is not supported on FPC slot 0.
- MX104—Replace ***fpc-slot*** with the value from **0** through **2**.
- MX240 router—Replace ***fpc-slot*** with a value from **0** through **2**.
- MX480 router—Replace ***fpc-slot*** with a value from **0** through **5**.
- MX960 router—Replace ***fpc-slot*** with a value from **0** through **11**.
- MX2020 router—Replace ***fpc-slot*** with a value from **0** through **19**.
- MX2010 router—Replace ***fpc-slot*** with a value from **0** through **9**.

mic-slot *slot-number*—MIC slot number. Replace ***slot-number*** with **0** or **1**.

Required Privilege Level maintenance

Related Documentation
- show chassis hardware on page 1253

List of Sample Output request chassis mic online on page 641
request chassis mic (MX Routers with Media Services Blade [MSB]) on page 641

request chassis mic offline (MX104 Router) on page 641
request chassis mic online (MX2010 Router) on page 641

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis mic online

```
user@host> request chassis mic online fpc-slot 1 mic-slot 1
```

request chassis mic (MX Routers with Media Services Blade [MSB])

```
user@host> request chassis mic fpc-slot 1 mic-slot 0
Possible completions:
  offline              Take MIC offline
  online               Bring MIC online
```

request chassis mic offline (MX104 Router)

```
user@host > request chassis mic mic-slot 0 fpc-slot 1 offline
fpc 1 mic 0 offline initiated, use "show chassis fpc pic-status 1" to verify
```

request chassis mic online (MX2010 Router)

```
user@host> request chassis mic online fpc-slot 1 mic-slot 0
FPC 1, MIC 0 is already online
```


request chassis optics

Syntax request chassis optics fpc-slot *fpc-slot-number* reactivate

Release Information Command introduced in Junos OS Release 12.3 for MX240, MX480, and MX960 3D Universal Edge Routers.

Description (MX240, MX480, and MX960 routers) Control the status of the optical transceiver.

Options **fpc-slot *fpc-slot-number***—Slot number of the line card that houses the optical transceiver.

- MX240 router—Replace ***fpc-slot-number*** with a value from 0 through 2.
- MX480 router—Replace ***fpc-slot-number*** with a value from 0 through 5.
- MX960 router—Replace ***fpc-slot-number*** with a value from 0 through 11.

reactivate—Reactivate the optical transceiver.

Required Privilege Level maintenance

Related Documentation

- *Supported Network Interface Standards by Transceiver*
- CHASSISD System Log Messages on page ?

List of Sample Output request chassis optics (MX480 router) on page 642

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis optics (MX480 router)

```
user@host> request chassis optics fpc-slot 5 reactivate
Enable FPC 5 non-nebs optics.
```

request chassis pcg

Syntax request chassis pcg (offline | online) slot *slot-number*

Release Information Command introduced before Junos OS Release 7.4.

Description (M40e and M160 routers) Control the operation of the Packet Forwarding Engine (PFE) clock generator (PCG).

Options **offline**—Take the PCG offline.

online—Bring the PCG online.

slot *slot-number*—PCG slot number. Replace ***slot-number*** with **0** or **1**.

Required Privilege Level maintenance

Related Documentation

- show chassis environment pcg on page 875

List of Sample Output request chassis pcg on page 643

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis pcg

```
user@host> request chassis pcg online slot 0
PCG 1 appears to be already online
```

request chassis pic

List of Syntax

Syntax on page 644
Syntax (ACX4000 Series Routers) on page 644
Syntax (TX Matrix and TX Matrix Plus Routers) on page 644

Syntax

request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number*

Syntax (ACX4000 Series Routers)

request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number*

Syntax (TX Matrix and TX Matrix Plus Routers)

request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number* <lcc *number*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 12.3 for ACX4000 Routers.
Command introduced in Junos OS Release 13.2 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Control the operation of the PIC.

NOTE: The **request chassis pic (offline | online) fpc-slot *slot number* pic-slot *slot-number*** command is not supported for built-in PICs on MX Series routers.

To view a list of built-in PICs on the router or switch chassis, use the **show chassis hardware** command.

NOTE: This command is not supported on MX960 and MX2020 routers with MPC5EQ.

NOTE: T1600 routers and TX Matrix Plus routers with 100-Gigabit Ethernet PICs require two adjacent PIC slots, 0 and 1, for each PIC. Therefore, only **online** and **offline** command options to PIC slot 0 are allowed. Use of the **online** and **offline** command options for PIC slot 1 with the described router and PIC combination is not allowed.

NOTE: In T Series routers, when the PIC state is set from **offline** to **online** or vice-versa before the processing is complete for the previous command, you are provided feedback on the status of your request. The following sample messages are displayed if you try to set a PIC **offline** or **online**:

user@switch> request chassis pic fpc-slot 1 pic-slot 0 online
```
fpc 1 pic 0 online initiated, use "show chassis fpc pic-status" to verify
```

user@switch> request chassis pic fpc-slot 1 pic-slot 0 online
```
FPC 1 PIC 0 already transitioning to online
```

When the same PIC is set to a different state while the transition is in progress, you are provided feedback on the status of your request.

user@switch> request chassis pic fpc-slot 1 pic-slot 0 offline
```
FPC 1, PIC 0 already transitioning to online.  Please retry later.
```

Options

offline—Take the PIC offline.

online—Bring the PIC online.

fpc-slot *slot-number*—Flexible PIC Concentrator (FPC) slot number. Replace ***slot-number*** with a value appropriate for your router or switch:

- ACX4000 routers—1 or 2.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—0.
  - EX4200 switches in a Virtual Chassis configuration—0 through 9 (switch's member ID).
  - EX8208 switches—0 through 7 (line card).
  - EX8216 switches—0 through 15 (line card).
- M5, M7i, M10, and M10i routers—0 or 1.
- M20 routers—0 through 3.
- M40 and M40e routers—0 through 7.
- M120 routers—0 through 5.
- M160 routers—0 through 7.
- M320 routers—0 through 7.
- MX 5, MX10, and MX40 routers—0 or 1.
- MX80 routers—0 or 1.
- MX240 routers—0 through 2
- MX480 routers—0 through 5
- MX2020 routers—0 through 19.

- MX2010 routers—0 through 9.
- MX960 routers—0 through 11.
- PTX5000 routers—0 or 1.
- T Series routers—0 through 7.
- TX Matrix and TX Matrix Plus routers only—On a TX Matrix router, if you specify the number of the T640 router by using the **lcc *number*** option (the recommended method), replace ***slot-number*** with a value from 0 through 7. Otherwise, replace ***slot-number*** with a value from 0 through 31.

  Likewise, on a TX Matrix Plus router, if you specify the ***number*** of the T1600 or T4000 router by using the lcc number option (the recommended method), replace ***slot-number*** with a value from 0 through 7. Otherwise, for the FPC slot number, replace ***slot-number*** with a value from 0 through 31. On a TX Matrix Plus router with 3D SIBs to assign the FPC slot number, replace *slot-number* with a value from **0** through **63**. For example, the following commands have the same result:

  user@host> **request chassis pic fpc-slot 1 lcc 1 pic-slot 0 offline**
  user@host> **request chassis pic fpc-slot 9 pic-slot 0 offline**

- QFX5100 standalone switches—0.

pic-slot *slot-number*—PIC slot number.

- EX3200 and EX4200 switches—0 for built-in network interfaces and 1 for interfaces on uplink modules.
- EX8208 and EX8216 switches—0.
- M Series routers—0, 1, 2, or 3
- MX960 router—***slot-number*** corresponds to the slot number of the Packet Forwarding Engine.
- PTX5000 routers—0 or 1.
- T320 router—0 or 1.
- T640 router—0, 1, 2, or 3.
- T1600 router —0, 1, 2, or 3.
- T4000 router—0, 1, 2, or 3.
- QFX5100 standalone switches—0, 1, or 2. PIC 0 is used for all interfaces that are not configured on expansion modules, and PIC 1 and PIC 2 are used for interfaces configured on expansion modules.

lcc *number*—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

Required Privilege Level maintenance

Related Documentation

- show chassis hardware on page 1253
- show chassis pic on page 1448
- *Configuring the PIC Type*

List of Sample Output request chassis pic on page 647

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis pic

```
user@host> request chassis pic pic-slot 0 online fpc-slot 0
FPC 0, PIC 0 is already online
```


request chassis redundancy feb slot

Syntax request chassis redundancy feb slot *slot-number* (switch-to-backup | revert-from-backup)

Release Information Command introduced in Junos OS Release 8.2.

Description (M120 routers only) Control the operation of the specified Forwarding Engine Board (FEB) in a redundancy group.

Options ***slot-number***—FEB slot number. Replace ***slot-number*** with a value from **0** through **5**.

switch-to-backup—Initiate a switchover from the specified active FEB to the backup FEB for the redundancy group.

revert-from-backup—Initiate a revert to the specified FEB following a switchover to the backup FEB for a redundancy group.

Required Privilege Level maintenance

Related Documentation

- show chassis redundancy feb on page 1487
- *Configuring FEB Redundancy on the M120 Router*
- *Understanding Switching Control Board Redundancy*

List of Sample Output
request chassis redundancy feb slot 2 switch-to-backup on page 648
request chassis redundancy feb slot 3 revert-to-backup on page 648

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis redundancy feb slot 2 switch-to-backup

```
user@host> request chassis redundancy feb slot 2 switch-to-backup
Switch initiated, use “show chassis redundancy febs” to verify
```

request chassis redundancy feb slot 3 revert-to-backup

```
user@host> request chassis redundancy feb slot 3 revert-to-backup
Revert initiated, use “show chassis redundancy febs” to verify
```


request chassis routing-engine master

List of Syntax

Syntax on page 649
Syntax (M Series, MX Series, T Series Routers) on page 649
Syntax (TX Matrix Routers) on page 649
Syntax (TX Matrix Plus Routers) on page 649
Syntax (MX Series Virtual Chassis) on page 649
Syntax (QFX Series) on page 649

Syntax

request chassis routing-engine master (acquire | release | switch)
<force>
<no-confirm>

Syntax (M Series, MX Series, T Series Routers)

request chassis routing-engine master (acquire | release | switch <check>)
<no-confirm>

Syntax (TX Matrix Routers)

request chassis routing-engine master (acquire | release | switch) (lcc *number* |
scc | all-chassis)
<force>
<no-confirm>

Syntax (TX Matrix Plus Routers)

request chassis routing-engine master (acquire | release | switch) (lcc *number* |
sfc | all-chassis | all-lcc)
<force>
<no-confirm>

Syntax (MX Series Virtual Chassis)

request chassis routing-engine master (acquire | release | switch <check>)
<all-members>
<local>
<member *member-id*>
<no-confirm>

Syntax (QFX Series)

request chassis routing-engine master (release | switch)
<check>
<interconnect-device *name*>
<node-group *name*>
<no-confirm>

Release Information

Command introduced before Junos OS Release 7.4.
all-chassis option added in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 11.3 for QFX Series.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

For routers or switches with multiple Routing Engines, control which Routing Engine is the master.

CAUTION: (Routing matrix based on the TX Matrix or TX Matrix Plus routers only) Within the routing matrix, we recommend that all Routing Engines run the same Junos OS Release. If you run different releases on the Routing Engines and a change in mastership occurs on any backup Routing Engine in the routing matrix, one or all routers (in a routing matrix based on the TX Matrix router or in a routing matrix based on a TX Matrix Plus router) might become logically disconnected from the TX Matrix router and cause data loss. For more information, see the *TX Matrix Router Hardware Guide* or the *Junos OS High Availability Library for Routing Devices*.

NOTE: Successive graceful Routing Engine switchover events must be a minimum of 240 seconds (4 minutes) apart after both Routing Engines have come up.

If the router or switch displays a warning message similar to "Standby Routing Engine is not ready for graceful switchover. Packet Forwarding Engines that are not ready for graceful switchover might be reset," do not attempt switchover. If you choose to proceed with switchover, only the Packet Forwarding Engines that were not ready for graceful switchover are reset. None of the Flexible PIC concentrators (FPCs) should spontaneously restart. We recommend that you wait until the warning no longer appears and then proceed with the switchover.

You will receive an error message stating "Command aborted. Not ready for mastership switch, try after n seconds" when this command is re-entered before 240 seconds have elapsed on EX Series switches.

NOTE: On a QFabric system, to avoid traffic loss on the network Node group, switch mastership of the routing engine to the backup routing engine, and then reboot.

Options

acquire—Attempt to become the master Routing Engine.

release—Request that the other Routing Engine become the master.

switch—Toggle mastership between Routing Engines.

NOTE: The **acquire** option should be used with caution because acquiring a Routing Engine may result in a corrupted database. If possible, use the **switch** option instead.

The **acquire**, **release**, and **switch** options have the following suboptions:

all-chassis—(TX Matrix and TX Matrix Plus routers only) On a routing matrix composed of a TX Matrix router and the attached T640 routers, switch mastership on all the Routing Engines in the routing matrix. Likewise, on a routing matrix composed of a TX Matrix Plus router and the attached T1600 or T4000 routers, switch mastership on all the Routing Engines in the routing matrix.

all-lcc—(TX Matrix Plus routers only) Request to acquire mastership for all line-card chassis (LCC).

all-members—(MX Series routers only) (Optional) Control Routing Engine mastership on the Routing Engines in all member routers of the Virtual Chassis configuration.

check—(QFabric systems , MX104, MX480, MX960, MX2010, and MX2020 routers, and PTX5000 routers only) (Optional) Available only with the **switch** option. Check graceful switchover status of the standby Routing Engine before toggling mastership between Routing Engines.

interconnect-device ***name***—(QFabric systems only) (Optional) Control Routing Engine mastership on the Routing Engines on an Interconnect device.

lcc ***number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Control Routing Engine mastership on the Routing Engines in the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Control Routing Engine mastership on the Routing Engines of the specified member in the Virtual Chassis Configuration. Replace ***member-id*** with a value of 0 or 1.

no-confirm—(Optional) Do not request confirmation for the switch.

node-group ***name***—(QFabric systems only) (Optional) Control Routing Engine mastership on the Routing Engines on a Node group.

scc—(TX Matrix routers only) TX Matrix (switch-card chassis).

sfc—(TX Matrix Plus routers only) TX Matrix Plus router (or switch-fabric chassis).

force—(Optional) Available only with the acquire option. Force the change to a new master Routing Engine.

NOTE: The **force** option is not supported on the M Series, MX Series, or T Series routers.

Additional Information

Because both Routing Engines are always running, the transition from one to the other as the master Routing Engine is immediate. However, the changeover interrupts communication to the System and Switch Board (SSB). The SSB takes several seconds to reinitialize the Flexible PIC Concentrators (FPCs) and restart the PICs. Interior gateway protocol (IGP) and BGP convergence times depend on the specific network environment.

By default, the Routing Engine in slot 0 (**RE0**) is the master and the Routing Engine in slot 1 (**RE1**) is the backup. To change the default master Routing Engine, include the **routing-engine** statement at the [**edit chassis redundancy**] hierarchy level in the configuration. For more information, see the *Junos OS Administration Library for Routing Devices*

To have the backup Routing Engine become the master Routing Engine, use the **request chassis routing-engine master switch** command. If you use this command to change the master and then restart the chassis software for any reason, the master reverts to the default setting.

NOTE: Although the configurations on the two Routing Engines do not have to be the same and are not automatically synchronized, we recommend making both configurations the same.

Required Privilege Level

maintenance

Related Documentation

- show chassis routing-engine on page 1490
- *Configuring Routing Engine Redundancy*
- *Switching the Global Master and Backup Roles in a Virtual Chassis Configuration*

List of Sample Output

request chassis routing-engine master acquire on page 653
request chassis routing-engine master switch on page 653
request chassis routing-engine master switch check on page 653

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis routing-engine master acquire

user@host> **request chassis routing-engine master acquire**

```
warning: Traffic will be interrupted while the PFE is re-initialized

warning: The other routing engine's file system could be corrupted

Reset other routing engine and become master ? [yes,no] (no)
```

request chassis routing-engine master switch

user@host> **request chassis routing-engine master switch**

```
warning: Traffic will be interrupted while the PFE is re-initialized
Toggle mastership between Routing Engines ? [yes,no] (no) yes

Resolving mastership...
Complete. The other Routing Engine becomes the master.
```

Switch mastership back to the local Routing Engine:

user@host> **request chassis routing-engine master switch**

```
warning: Traffic will be interrupted while the PFE is re-initialized
Toggle mastership between routing engines ? [yes,no] (no) yes

Resolving mastership...
Complete. The local routing engine becomes the master.
```

request chassis routing-engine master switch check

Usage shown for M Series, MX Series, and T Series routers.

```
{master}[edit]
```

user@host> **request chassis routing-engine master switch check**

```
warning: Standby Routing Engine is not ready for graceful switchover.
```

```
{master}[edit]
```

user@host> **request chassis routing-engine master switch check**
```
Switchover Ready
```

You can similarly check the backup Routing Engine.

request chassis scg

List of Syntax

Syntax on page 654
Syntax (TX Matrix and TX Matrix Plus Routers) on page 654

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 router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

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 901
- *Configuring the Clock Source*
- *T320 SONET Clock Generator (SCG) Description*

List of Sample Output

request chassis scg on page 655

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis scg

```
user@host> request chassis scg online slot 0
Online initiated, use "show chassis environment scg" to verify
```

request chassis sfb

Syntax request chassis sfb (offline | online) slot *slot-number*

Release Information Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description Control the operation of the Switch Fabric Board (SFB).

Options

offline—Take the Switch Fabric Board offline.

online—Bring the Switch Fabric Board online.

slot *slot-number*—Switch Fabric Board slot number. Replace ***slot-number*** with a value of 0 through 7.

Required Privilege Level maintenance

Related Documentation

- show chassis sfb on page 1514

List of Sample Output

request chassis sfb on page 656
request chassis sfb (MX2010 Routers) on page 656

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis sfb

```
user@host> request chassis sfb offline slot 1
Backup SFB 1 cannot be set offline, backup RE is online
```

request chassis sfb (MX2010 Routers)

```
user@host> request chassis sfb offline slot 7
Offline initiated, use "show chassis sfb" to verify
```


request chassis sfm master switch

Syntax request chassis sfm master switch
<no-confirm>

Release Information Command introduced before Junos OS Release 7.4.

Description (M40e and M160 routers only) Control which Switching and Forwarding Module (SFM) is master.

Options **no-confirm**—(Optional) Do not display a switch warning or query.

Additional Information 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 Administration Library for Routing Devices*.

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 1516
- *Switching the Global Master and Backup Roles in a Virtual Chassis Configuration*

List of Sample Output request chassis sfm master switch on page 657
request chassis sfm master switch no-confirm on page 657

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 1516
- *Configuring SFM Redundancy on M40e and M160 Routers*
- *M40e Switching and Forwarding Module (SFM) Description*

List of Sample Output
request chassis sfm (M40e) on page 658
request chassis sfm (M160) on page 658

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis sfm (M40e)

```
user@host> request chassis sfm slot 1 restart
M40e router:
error: SFM 0 is transitioning to online state.
```

request chassis sfm (M160)

```
user@host> request chassis sfm slot 1 restart
M160 router:
Restart initiated, use "show chassis sfm" to verify
```


request chassis sib

List of Syntax

Syntax on page 659
Syntax (TX Matrix Router) on page 659
Syntax (TX Matrix Plus Router) on page 659

Syntax

request chassis sib (offline | online) slot *slot-number*

Syntax (TX Matrix Router)

request chassis sib (all-chassis | lcc *number* | scc) (offline | online) slot *slot-number* (start-receiver *number* | stop-receiver *number*)

Syntax (TX Matrix Plus Router)

request chassis sib (all-lcc | f13 *slot-number* | f2s *sib-slot/sib-f2s-slot-number* |lcc *number* | (offline | online) slot *slot-number*)

Release Information

Command introduced before Junos OS Release 7.4.
f13 and **f2s** options for the TX Matrix Plus router introduced in Junos OS Release 9.6.

Description

(M320 routers and T Series routers only) Control the operation of the specified Switch Interface Board (SIB).

Options

all-chassis—(TX Matrix routers only) Control the status of the specified SIB.

all-lcc—(TX Matrix Plus router only) On TX Matrix Plus router, control the operation of the SIB on all 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 router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc—(TX Matrix router only) TX Matrix router (switch-card chassis) on a routing matrix.

offline—Take the SIB offline.

NOTE: In PTX Series (PTX3000 and PTX5000) and T Series (T640 and T1600) Routers with active PFE interfaces, when the last SIB is taken offline, a message displays that if no SIB is brought online within 10 seconds, the system will take action to address the fabric black hole condition. Taking all SIBs offline in these PTX Series or T Series Routers with active PFE interfaces results in traffic black hole condition, and the software takes action to rectify this condition if it persists for more than 10 seconds. If these routers do not have active PFE interfaces, taking all SIBs offline does not result in black hole condition, and the message is not displayed when the last active SIB is taken offline. For details on black hole condition, see "Traffic Black Hole Caused by Fabric Degradation" on page 351.

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 1519
- show chassis environment sib on page 920
- Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 190
- *M320 SIB Description*

List of Sample Output request chassis sib on page 660
request chassis sib on page 661

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis sib

```
user@host> request chassis sib slot 0 online
Online initiated, use "show chassis sibs" to verify
```


request chassis sib

```
user@host> request chassis sib f13 slot 0 offline
Offline initiated, use "show chassis sibs" to verify
```

request chassis sib f13 train-link-receive slot

List of Syntax

Syntax on page 662
Syntax (TX Matrix Plus Router) on page 662

Syntax

request chassis sib f13 train-link-receive slot *SFC-SIB-F13–slot-num*

Syntax (TX Matrix Plus Router)

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 router 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 663**
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 207

List of Sample Output

request chassis sib f13 train-link-receive slot on page 662

Output Fields

When you enter this command, the SFC is ready to receive traffic from the T1600 or T4000 router (LCC).

Sample Output

request chassis sib f13 train-link-receive slot

```
user@host> request chassis sib f13 train-link-receive slot 0
```

request chassis sib f13 train-link-transmit slot

Syntax 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 router 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 662**
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 207

List of Sample Output **request chassis sib f13 train-link-transmit slot on page 663**

Output Fields When you enter this command, the SFC is ready to transmit traffic to the T1600 or T4000 router (LCC).

Sample Output

request chassis sib f13 train-link-transmit slot

```
user@host> request chassis sib f13 train-link-transmit slot 0
```

request chassis sib optics lcc

Syntax request chassis sib optics lcc *number* sib-slot *number* optics-slot *number* (enable | disable)

Release Information Command introduced in Junos OS Release 13.1 for TX Matrix Routers with 3D SIBs.

Description (TX Matrix Plus routers with 3D SIBs only) Control the operation of the high-speed links on the LCCs by enabling or disabling the high-speed links.

Options **lcc *number***—Line-card chassis number. Replace the *number* with the following values depending on the LCC configuration.

- 0 through 7, T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

sib-slot *number*—SIB slot number. Replace the *number* with a value from 0 to 15.

optics-slot *number*—Optics slot number for high-speed link cable. Replace the *number* with a value from 0 to 15.

enable—Start the high-speed linkss on the cables and enable the FPCs.

disable—Disable the FPCs and stop the high-speed links on the cables.

Required Privilege Level maintenance

Related Documentation

- *show chassis fabric optical-links*

List of Sample Output request chassis sib optics lcc on page 664
request chassis sib optics lcc on page 664

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis sib optics lcc

```
user@host> request chassis sib optics lcc 7 optics-slot 6 sib-slot 6 enable
Optics 6 enable initiated, use "show chassis fabric optical-links detail" to
verify
```

request chassis sib optics lcc

```
user@host> request chassis sib optics lcc 7 optics-slot 6 sib-slot 6 disable
Optics 6 disable initiated, use "show chassis fabric optical-links detail" to
verify
```


request chassis sib optics sfc

Syntax request chassis sib optics sfc *slot-number* sib-slot *number* optics-slot *number* (enable | disable)

Release Information Command introduced in Junos OS Release 13.1 for TX Matrix Routers with 3D SIBs.

Description (TX Matrix Plus routers with 3D SIBs only) Control the operation of the high-speed links on the SIBs by enabling or disabling the high-speed links.

Options **sfc *slot-number***—SFC slot number. Replace the *slot-number* with 0.

sib-slot *number*—SIBslot number. Replace the *number* with a value from 0 to 15.

optics-slot *number*—Optics slot number for high-speed link cable. Replace the *number* with a value from 0 to 15.

enable—Start the high-speed links on the cables and enable the FPCs.

disable—Disable the FPCs and stop the HSLs on the cables.

Required Privilege Level maintenance

Related Documentation

- *show chassis fabric optical-links*

List of Sample Output request chassis sib optics sfc on page 665
request chassis sib optics sfc on page 665

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis sib optics sfc

```
user@host> request chassis sib optics sfc 0 optics-slot 6 sib-slot 6 enable
Optics 6 enable initiated, use "show chassis fabric optical-links detail" to
verify
```

request chassis sib optics sfc

```
user@host> request chassis sib optics sfc 0 optics-slot 6 sib-slot 6 disable
Optics 6 disable initiated, use "show chassis fabric optical-links detail" to
verify
```


request chassis sib train-link-receive slot

Syntax 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), T4000 Router (LCC), and TX Matrix Plus router 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 667**
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 207

List of Sample Output **request chassis sib train-link-receive slot on page 666**

Output Fields When you enter this command, the LCC is ready to receive traffic from the SFC.

Sample Output

request chassis sib train-link-receive slot

```
user@host> request chassis sib train-link-receive slot 0
```


request chassis sib train-link-transmit slot

List of Syntax

Syntax on page 667
Syntax (TX Matrix Plus Routing Platform) on page 667

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), T4000 (LCC) and TX Matrix Plus router 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 666**
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 207

List of Sample Output

request chassis sib train-link-transmit slot on page 667

Output Fields

When you enter this command, the LCC is ready to transmit traffic to the SFC.

Sample Output

request chassis sib train-link-transmit slot

```
user@host> request chassis sib train-link-transmit slot 0
```


request chassis spmb restart

List of Syntax

Syntax on page 668
Syntax (TX Matrix Router) on page 668
Syntax (TX Matrix Plus Router) on page 668

Syntax

request chassis spmb restart slot *slot-number*

Syntax (TX Matrix Router)

request chassis spmb restart (lcc *number* | scc) slot *slot-number*

Syntax (TX Matrix Plus Router)

request chassis spmb restart (lcc *number* | sfc *number*) slot *slot-number*

Release Information

Command introduced before Junos OS Release 7.4.
sfc option for the TX Matrix Plus router introduced in Junos OS Release 9.6.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

Restart the specified Switch Processor Mezzanine Board (SPMB) on the Control Board (CB).

Options

lcc *number*—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc—(TX Matrix routers only) TX Matrix router (switch-card chassis) in the routing matrix.

sfc *number*—(TX Matrix Plus routers only) The switch-fabric chassis number of the TX Matrix Plus router. Replace the *number* variable with a value **0**.

slot *slot-number*—The SPMB slot number. Replace ***slot-number*** with **0** or **1**.

Required Privilege Level

maintenance

Related Documentation

- show chassis spmb on page 1530
- show chassis spmb sibs on page 1540

List of Sample Output
request chassis spmb restart on page 669
request chassis spmb restart (MX2010 Router) on page 669

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis spmb restart

```
user@host> request chassis spmb restart slot 0
```

request chassis spmb restart (MX2010 Router)

```
user@host>  request chassis spmb restart slot 0
Restart initiated, use "show chassis spmb" to verify
```

request chassis synchronization mode

Syntax request chassis synchronization mode (free-run | holdover | auto-select)

Release Information Command introduced in Junos OS Release 11.2R4 for MX Series 3D Universal Edge Routers.

Description (MX5-T, MX10-T, MX40-T, MX80, MX80-T, MX240, MX480, and MX960 routers only) Change the chassis synchronization source used for Synchronous Ethernet configuration.

Options

freerun—Change chassis synchronization to free-run mode.

holdover—Change chassis synchronization to holdover mode.

auto-select—Change chassis synchronization to auto-select mode.

Required Privilege Level maintenance

Related Documentation

- Synchronous Ethernet Overview on page 133
- Configuring an External Clock Synchronization Interface for MX Series Routers on page 309

List of Sample Output

request chassis synchronization mode freerun on page 670
request chassis synchronization mode holdover on page 670
request chassis synchronization mode auto-select on page 670

Output Fields When you enter this command, the current status of your request is displayed.

- **Not configured**—Indicates that the source is not configured.
- **Present**—Indicates that the source is configured and present.
- **Qualified**—Indicates that the source is being used for synchronization.

Sample Output

request chassis synchronization mode freerun

```
user@host> request chassis synchronization mode freerun
mode is freerun, status: qualified
```

Sample Output

request chassis synchronization mode holdover

```
user@host> request chassis synchronization mode holdover
mode is holdover, status: qualified
```

Sample Output

request chassis synchronization mode auto-select

```
user@host> request chassis synchronization mode auto-select
```



```
mode is auto-select, status: qualified
```

request chassis synchronization switch

List of Syntax

Syntax on page 672
Syntax (M Series, T Series) on page 672
Syntax (PTX Series) on page 672

Syntax

request chassis synchronization switch

Syntax (M Series, T Series)

request chassis synchronization switch (external-a | external-b)

Syntax (PTX Series)

request chassis synchronization switch (bits-a | bits-b | fpc-*slot-number* | gps-0-10mhz | gps-0-5mhz | gps-1-10mhz | gps-1-5mhz)

Release Information

Command introduced in Junos OS Release 7.6.
Command introduced in Junos OS Release 8.3 for M40e routers.
Command introduced in Junos OS Release 9.3 for M120 routers.
Command introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers.
Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.

Description

(M320, M40e, M120, T320, T640, and T1600 routers and PTX Packet Transport Routers only) Change the external clock source used for chassis synchronization.

Options

external-a—(Routing matrix only) Change the synchronization source to external source A.

external-b—(Routing matrix only) Change the synchronization source to external source B.

bits-a—(PTX Series only) Change the synchronization source to the BITS external source A.

bits-b—(PTX Series only) Change the synchronization source to the BITS external source B.

fpc-*slot-number*—(PTX Series only) Change the synchronization source to an FPC in the slot specified. For the PTX5000 Packet Transport Router, replace *slot-number* with a value from **0** through**7**.

gps-0-10mhz—(PTX Series only) Change the synchronization source to the 10 MHz GPS source on CCG port 0.

gps-0-5mhz—(PTX Series only) Change the synchronization source to the 5 MHz GPS source on CCG port 0.

gps-1-10mhz—(PTX Series only) Change the synchronization source to the 10 MHz GPS source on CCG port 1.

gps-1-5mhz—(PTX Series only) Change the synchronization source to the 5 Hz GPS source on CCG port 1.

Required Privilege Level
maintenance

Related Documentation
- show chassis synchronization on page 1546
- Configuring Clock Synchronization Interface on MX Series Routers on page 309
- *Supported Time Synchronization Standard*

List of Sample Output
request chassis synchronization switch (M Series, T Series) on page 673
request chassis synchronization switch (PTX Series) on page 673

Output Fields
When you enter this command, you are provided feedback on the status of your request. **Not configured** indicates that the source is not configured. **Present** indicates that the source is configured and present. **Qualified** indicates that the source is being used for synchronization.

Sample Output

request chassis synchronization switch (M Series, T Series)

```
user@host> request chassis synchronization switch external-a
switching to external-a, status: qualified
```

request chassis synchronization switch (PTX Series)

```
user@host> request chassis synchronization switch fpc-2
switching to fpc-2, status: qualified
```


set chassis display message

List of Syntax

Syntax on page 674
Syntax (TX Matrix Router) on page 674
Syntax (TX Matrix Plus Router) on page 674

Syntax

set chassis display message "*message*"
<permanent>

Syntax (TX Matrix Router)

set chassis display message "*message*" (lcc *number* | scc)
<permanent>

Syntax (TX Matrix Plus Router)

set chassis display message “*message* ” (fpc-slot *slot-number* | lcc *number* | sfc *number*)
<permanent>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option for TX Matrix Plus router introduced in Junos OS Release 9.6.

Description

Display or stop a text message on the craft interface display, which is on the front of the router, or on the LCD panel display on the switch. The craft interface alternates the display of text messages with standard craft interface messages three times, switching between messages every 60 seconds.

NOTE: On T Series routers, when this command is executed with the permanent option, the display of the text message alternates with that of the standard craft interface message continuously every 60 seconds.

By default, on both the router and the switch, the text message is displayed for 5 minutes. The craft interface display has four 20-character lines. The LCD panel display has two 16-character lines, and text messages appear only on the second line.

Options

"*message*"—Message to display. On the craft interface display, if the message is longer than 20 characters, it wraps onto the next line. If a word does not fit on one line, the entire word moves down to the next line. Any portion of the message that does not fit on the display is truncated. An empty pair of quotation marks (“ ”) deletes the text message from the craft interface display. On the LCD panel display, the message is limited to 16 characters.

fpc-slot *slot-number*—(TX Matrix Plus routers and EX4200 and QFX Series only) On the router or switch, display the text message on the craft interface for a specific Flexible PIC Concentrator (FPC). Replace ***slot-number*** with a value from **0** through **31**. On the switch, display the text message for a specific member of a Virtual Chassis, where **fpc-slot *slot-number*** corresponds to the member ID. Replace ***slot-number*** with a value from **0** through **9**. On the QFX Series, the ***slot-number*** is always **0**. On a TX Matrix Plus router with 3D SIBs replace *slot-number* with a value from **0** through **63**.

lcc ***number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

permanent—(Optional) Display a text message on the craft interface display or LCD panel display permanently.

scc—(TX Matrix routers only) Display the text message on the craft interface display of the TX Matrix router (switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) Display the text message on the craft interface display of the TX Matrix Plus router (or switch-fabric chassis).

Required Privilege Level clear

Related Documentation

- *Configuring the LCD Panel on EX Series Switches (CLI Procedure)*
- clear chassis display message on page 611
- show chassis craft-interface on page 703
- *Understanding the Implementation of System Log Messages on the QFabric System*

List of Sample Output set chassis display message (Creating) on page 675
set chassis display message (Deleting) on page 676

Output Fields See show chassis craft-interface for an explanation of output fields.

Sample Output

set chassis display message (Creating)

The following example shows how to set the display message and verify the result:

```
user@host> set chassis display message "NOC contact Dusty (888) 555-1234"
message sent
```

```
user@host> show chassis craft-interface
Red alarm:     LED off, relay off
Yellow alarm:  LED off, relay off
Host OK LED:   On
Host fail LED: Off
FPCs      0  1  2  3  4  5  6  7
```

```
------------------------------
Green  ..  *..  *  *.
Red    ........
LCD screen:
     +--------------------+
     |NOC contact Dusty   |
     |(888) 555-1234      |
     +--------------------+
```

set chassis display message (Deleting)

The following example shows how to delete the display message and verify that the message is removed:

```
user@host> set chassis display message ""
message sent
```

```
user@host> show chassis craft-interface
Red alarm:     LED off, relay off
Yellow alarm:  LED off, relay off
Host OK LED:   On
Host fail LED: Off
FPCs     0  1  2  3  4  5  6  7
------------------------------
Green  ..  *..  *  *.
Red    ........
LCD screen:
     +--------------------+
     |host                |
     |Up: 0+17:05:47      |
     |                    |
     |Temperature OK      |
     +--------------------+
```

CHAPTER 28

Monitoring Commands

- show chassis fabric destinations
- show chassis fabric feb
- show chassis fabric errors
- show chassis fabric fpcs
- show chassis fabric map
- show chassis fabric optics
- show chassis fabric plane
- show chassis fabric plane-location
- show chassis fabric redundancy-mode
- show chassis fabric reachability
- show chassis fabric sibs
- show chassis fabric summary
- show chassis fabric topology
- show chassis fabric degraded-fabric-reachability
- show chassis fabric unreachable-destinations
- show chassis fan
- show chassis feb
- show chassis firmware
- show chassis forwarding
- show chassis fpc
- show chassis fpc-feb-connectivity
- show chassis hardware
- show chassis in-service-upgrade
- show chassis lccs
- show chassis lcc-mode
- show chassis location
- show chassis mac-addresses
- show chassis network services
- show chassis oss-map
- show chassis pic
- show chassis power
- show chassis power sequence
- show chassis psd
- show chassis redundancy feb
- show chassis routing-engine
- show chassis scb
- show chassis sfb

- show chassis sfm
- show chassis sibs
- show chassis spmb
- show chassis spmb sibs
- show chassis synchronization
- show chassis synchronization (MX Series Routers)
- show chassis temperature-thresholds
- show chassis zones (PTX Series Packet Transport Routers)
- show chassis zones
- show fib-local-accounting ip
- show ptp clock
- show ptp hybrid
- show ptp lock-status
- show ptp master
- show ptp port
- show ptp slave
- show synchronous-ethernet esmc statistics
- show synchronous-ethernet esmc transmit
- show synchronous-ethernet global-information

show chassis adc

Syntax show chassis adc

Release Information Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description Display chassis information about the adapter cards (ADCs).

Options **none**—Display information about all adapter cards.

Required Privilege Level view

Related Documentation
- show chassis environment adc on page 783

List of Sample Output show chassis adc (MX2020 Router) on page 680
show chassis adc (MX2010 Router) on page 681

Output Fields Table 40 on page 680 lists the output fields for the **show chassis adc** command. Output fields are listed in the approximate order in which they appear.

Table 40: show chassis adc Output Fields

Field Name	Field Description
Slot	Slot number.
State	Status of the adapter card. • **Online**—The adapter card is online and running. • **Offline**—Adapter card is powered down.
Uptime	How long the Routing Engine has been connected to the adapter card and, therefore, how long the adapter card has been up and running.

Sample Output

show chassis adc (MX2020 Router)

```
user@host> show chassis adc
Slot  State                            Uptime
 0    Online 1 hour, 21 minutes, 7 seconds
 1    Online 1 hour, 21 minutes, 3 seconds
 2    Online 1 hour, 20 minutes, 59 seconds
 3    Online 1 hour, 20 minutes, 54 seconds
 4    Online 1 hour, 20 minutes, 50 seconds
 5    Online 1 hour, 20 minutes, 46 seconds
 6    Online 1 hour, 20 minutes, 42 seconds
 7    Online 1 hour, 20 minutes, 37 seconds
 8    Online 1 hour, 20 minutes, 33 seconds
 9    Online 1 hour, 20 minutes, 28 seconds
10    Online 1 hour, 20 minutes, 24 seconds
```



```
11    Online 1 hour, 20 minutes, 19 seconds
12    Online 1 hour, 20 minutes, 15 seconds
13    Online 1 hour, 20 minutes, 8 seconds
14    Online 1 hour, 20 minutes, 4 seconds
15    Online 1 hour, 19 minutes, 59 seconds
16    Online 1 hour, 19 minutes, 55 seconds
17    Online 1 hour, 19 minutes, 50 seconds
18    Online 1 hour, 19 minutes, 45 seconds
19    Online 1 hour, 19 minutes, 39 seconds
```

show chassis adc (MX2010 Router)

```
user@host > show chassis adc
Slot  State                            Uptime
 0    Online 12 hours, 17 minutes, 38 seconds
 1    Online 12 hours, 17 minutes, 30 seconds
 2    Online 12 hours, 17 minutes, 22 seconds
 3    Online 12 hours, 17 minutes, 14 seconds
 4    Online 12 hours, 17 minutes, 6 seconds
 5    Online 12 hours, 16 minutes, 58 seconds
 6    Online 12 hours, 16 minutes, 49 seconds
 7    Online 12 hours, 16 minutes, 41 seconds
 8    Online 12 hours, 16 minutes, 33 seconds
 9    Online 12 hours, 16 minutes, 25 seconds
```

show chassis afeb

Syntax show chassis afeb

Release Information Command introduced in Junos OS Release 13.2.

Description Display compact Forwarding Engine Board status.

Options This command has no options.

Required Privilege Level view

Related Documentation

- request chassis afeb on page 615

List of Sample Output show chassis afeb (MX104 Router) on page 683

Output Fields Table 41 on page 682 lists the output fields for the **show chassis afeb** command. Output fields are listed in the approximate order in which they appear.

Table 41: show chassis afeb

Field Name	Field Description

State	State of the compact Forwarding Engine Board:
	• **Offline**—FEB is powered down.
	• **Online**—FEB is operational and running.
	• **Check**—FEB is in alarmed state because of the following reasons:
	  ◦ Hardware error.
	  ◦ PFE is unable to boot.

Temperature	Temperature of the air passing by the FEB, in degrees Celsius or in both degrees Celsius and degrees Fahrenheit.
CPU Utilization	Total percentage of CPU being used.
Interrupt Utilization	Of the total CPU being used by the FEB processor, the percentage being used for interrupts.
Heap Utilization	Percentage of heap space (dynamic memory) being used by the FEB processor. If this number exceeds 80 percent, you might experience a software problem (memory leak).
Buffer Utilization	Percentage of buffer space being used by the FEB processor for buffering internal messages.
Total CPU DRAM	Total DRAM, in megabytes, available to the FEB processor.
Start time	Time when the Routing Engine detected that the FEB was running.
Uptime	How long the Routing Engine has been connected to the FEB and, therefore, how long the compact Forwarding Engine Board has been up and running.

Sample Output

show chassis afeb (MX104 Router)

```
user@host> show chassis afeb
FEB status:
Slot 0 information:
  State                               Online
  Temperature                      31 degrees C / 87 degrees F
  CPU utilization                   3 percent
  Interrupt utilization             0 percent
  Heap utilization                 11 percent
  Buffer utilization               13 percent
  Total CPU DRAM                 2048 MB
  Start time:                         2013-05-27 08:50:03 IST
  Uptime:                             3 hours, 29 minutes, 34 seconds
```


show chassis alarms

List of Syntax

Syntax

show chassis alarms

Syntax (TX Matrix Routers)

show chassis alarms
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis alarms
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis alarms
<all-members>
<local>
<member *member-id*>

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis alarms

Syntax (QFX Series)

show chassis alarms
<interconnect-device *name*>
<node-device *name*>

Syntax (OCX Series)

show chassis alarms

Syntax (PTX Series Packet Transport Routers)

show chassis alarms

Syntax (ACX Series Universal Access Routers)

show chassis alarms

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option for the TX Matrix Plus router introduced in Junos OS Release 9.6.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.

Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display information about the conditions that have been configured to trigger alarms.

Options **none**—Display information about the conditions that have been configured to trigger alarms.

all-members—(MX Series routers only) (Optional) Display information about alarm conditions for all the member routers of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display information about alarm conditions for the Interconnect device.

lcc *number*—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display information about alarm conditions for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display information about alarm conditions for the specified member of the Virtual Chassis configuration. Replace *member-id* variable with a value of 0 or 1.

node-device *name*—(QFabric systems only) (Optional) Display information about alarm conditions for the Node device.

scc—(TX Matrix router only) (Optional) Show information about the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus router only) (Optional) Show information about the respective TX Matrix Plus router, which is the switch-fabric chassis. Replace *number* variable with **0**.

Additional Information

You cannot clear the alarms for chassis components. Instead, you must remedy the cause of the alarm. When a chassis alarm LED is lit, it indicates that you are running the router or switch in a manner that we do not recommend.

On routers, you can manually silence external devices connected to the alarm relay contacts by pressing the alarm cutoff button, located on the craft interface. Silencing the device does not remove the alarm messages from the display (if present on the router) or extinguish the alarm LEDs. In addition, new alarms that occur after you silence an external device reactivate the external device.

In Junos OS release 11.1 and later, alarms for fans also show the slot number of the fans in the CLI output.

In Junos OS Release 11.2 and later, the command output on EX8200 switches shows the detailed location (**Plane/FPC/PFE**) for link errors in the chassis.

In Junos OS Release 10.2 and later, an alarm is shown on T Series routers for a standby sonic clock generator (SCG) that is offline or absent.

You may often see the following error messages, in which only the error code is shown and no other information is provided:

```
Apr 12 08:04:10 send: red alarm set, device FPC 6, reason FPC 6 Major Errors - Error code: 257
Apr 12 08:04:19 send: red alarm set, device FPC 1, reason FPC 1 Major Errors - Error code: 559
```

To understand what CM_ALARM error codes mean, you need to first identify the structure of the CM Alarm codes. A CM_ALARM code has the following structure:

Bits:	Error type:
1-31	Major (1)
0	Minor (0)

According to the table above, the LSB (bit 0) identifies the **Error Type** (major alarm, if the bit is set and minor alarm if the bit is unset). The rest of the bits (1 - 31) identify the actual error code.

Take an example of the following error code, which was logged on a T1600:

```
Apr 12 08:04:10 send: red alarm set, device FPC 1, reason FPC 1 Major Errors - Error code: 559
```

First, you have to convert 559 to binary; that is **1000101111**. The LSB in this case is **1**, which means that this is a major alarm. After removing the LSB, you are left with **100010111**, which is equal to 279 in decimal. This is the actual error code, its meaning can be found from the following list:

Chip Type: L Chip	Code
CMALARM_LCHIP_LOUT_DESRD_PARITY_ERR	1

CMALARM_LCHIP_LOUT_DESRD_UNINIT_ERR	2
CMALARM_LCHIP_LOUT_DESRD_ILLEGALLINK_ERR	3
CMALARM_LCHIP_LOUT_DESRD_ILLEGALSIZE_ERR	4
CMALARM_LCHIP_LOUT_HDRF_TOERR_ERR	5
CMALARM_LCHIP_LOUT_HDRF_PARITY_ERR	6
CMALARM_LCHIP_LOUT_HDRF_UCERR_ERR	7
CMALARM_LCHIP_LOUT_NLIF_CRCDROP_ERR	8
CMALARM_LCHIP_LOUT_NLIF_CRCERR_ERR	9
CMALARM_LCHIP_UCODE_TIMEOUT_ERR	10
CMALARM_LCHIP_LIN_SRCTL_ACCT_DROP_ERR	11
CMALARM_LCHIP_LIN_SRCTL_ACCT_ADDR_SIZE_ERR	12
CMALARM_LCHIP_SRAM_PARITY_ERR	13
CMALARM_LCHIP_UCODE_OVFLW_ERR	14
CMALARM_LCHIP_LOUT_HDRF_MTU_ERR	15

Chip Type: M Chip	Code
CMALARM_MCHIP_ECC_UNCORRECT_ERR	128

Chip Type: N Chip	Code
CMALARM_NCHIP_RDDMA_JBUS_TIMEOUT_ERR	256
CMALARM_NCHIP_RDDMA_FIFO_OVFLW_ERR	257
CMALARM_NCHIP_RDDMA_FIFO_UNFLW_ERR	258
CMALARM_NCHIP_RDDMA_SIZE_ERR	259
CMALARM_NCHIP_RDDMA_JBUS_CRC_ERR	260
CMALARM_NCHIP_WRDMA_PKTR_ERR	261
CMALARM_NCHIP_WRDMA_PKT_CRC_ERR	262
CMALARM_NCHIP_WRDMA_JBUS_TIMEOUT_ERR	263

CMALARM_NCHIP_WRDMA_FIFO_OVFLW_ERR	264
CMALARM_NCHIP_WRDMA_FIFO_UNFLW_ERR	265
CMALARM_NCHIP_WRDMA_PKT_LEN_ERR	266
CMALARM_NCHIP_WRDMA_JBUS_CRC_ERR	267
CMALARM_NCHIP_PKTR_DMA_AGE_ERR	268
CMALARM_NCHIP_PKTR_ICELLSIG_ERR	269
CMALARM_NCHIP_PKTR_FTTL_ERR	270
CMALARM_NCHIP_RODR_OFFSET_OVFLW_ERR	271
CMALARM_NCHIP_PKTR_TMO_CELL_ERR	272
CMALARM_NCHIP_PKTR_TMO_OUTRANGE_ERR	273
CMALARM_NCHIP_PKTR_MD_REQUEST_Q_OVFLW_ERR	274
CMALARM_NCHIP_PKTR_DMA_BUFFER_OVFLW_ERR	275
CMALARM_NCHIP_PKTR_GRT_OVFLW_ERR	276
CMALARM_NCHIP_FRQ_ERR	277
CMALARM_NCHIP_RODR_IN_Q_OVFLW_ERR	278
CMALARM_NCHIP_DBUF_CRC_ERR	279

Chip Type: R Chip	**Code**
CMALARM_RCHIP_SRAM_PARITY_ERR	512

Chip Type: R Chip	**Code**
CMALARM_ICHIP_WO_DESRD_ID_ERR	601
CMALARM_ICHIP_WO_DESRD_DATA_ERR	602
CMALARM_ICHIP_WO_DESRD_OFLOW_ERR	603
CMALARM_ICHIP_WO_HDRF_UCERR_ERR	604
CMALARM_ICHIP_WO_HDRF_MTUERR_ERR	605
CMALARM_ICHIP_WO_HDRF_PARITY_ERR	606

CMALARM_ICHIP_WO_HDRF_TOERR_ERR	607
CMALARM_ICHIP_WO_IP_CRC_ERR	608
CMALARM_ICHIP_WO_IP_INTER_ERR	609
CMALARM_ICHIP_WI_WAN_TIMEOUT_ERR	625
CMALARM_ICHIP_WI_FAB_TIMEOUT_ERR	626
CMALARM_ICHIP_RLDRAM_BIST_ERR	630
CMALARM_ICHIP_SDRAM_BIST_ERR	631
CMALARM_ICHIP_RLDRAM_PARITY_ERR	632
CMALARM_ICHIP_SDRAM_UNCORRECT_ERR	633
CMALARM_ICHIP_SDRAM_CORRECT_ERR	634
CMALARM_ICHIP_FUSE_DONE_ERR	635

According to the table above, the **279** error code corresponds to **CMALARM_NCHIP_DBUF_CRC_ERR**; this means that new CRC errors were seen on the NCHIP of this particular FPC, which is FPC as per the logs.

If you do not want to convert decimal to binary and vice versa, you may use the following shortcut:

For major alarms, the **Actual Error Code = (Error Code - 1)/2**, where **Error Code** is the code that you get in the log message. For example, if you get the following log:

```
Apr 12 08:04:10 send: red alarm set, device FPC 6, reason FPC 6 Major Errors - Error
code: 257
```

Actual Error Code = (257-1)/2 = 128. Similarly, for minor alarms, Actual Error Code = (Error Code)/2

Required Privilege Level

view

Related Documentation

- *Configuring an RMON Alarm Entry and Its Attributes*
- Chassis Conditions That Trigger Alarms on page 381

List of Sample Output

show chassis alarms (Alarms Active) on page 691
show chassis alarms (No Alarms Active) on page 691
show chassis alarms (Fan Tray) on page 691
show chassis alarms (MX104 Router) on page 691
show chassis alarms (MX2010 Router) on page 691

Output Fields Table 42 on page 690 lists the output fields for the **show chassis alarms** command. Output fields are listed in the approximate order in which they appear.

Table 42: show chassis alarms Output Fields

Field Name	Field Description
Alarm time	Date and time the alarm was first recorded.
Class	Severity class for this alarm: **Minor** or **Major**.
Description	Information about the alarm.

Sample Output

show chassis alarms (Alarms Active)

```
user@host> show chassis alarms
3 alarms are currently active
Alarm time              Class  Description
2000-02-07 10:12:22 UTC Major fxp0: ethernet link down
2000-02-07 10:11:54 UTC Minor YELLOW ALARM - PEM 1 Removed
2000-02-07 10:11:03 UTC Minor YELLOW ALARM - Lower Fan Tray Removed
```

show chassis alarms (No Alarms Active)

```
user@host> show chassis alarms
No alarms are currently active
```

show chassis alarms (Fan Tray)

```
user@host> show chassis alarms
4 alarms currently active
Alarm time               Class  Description
2010-11-11 20:27:38 UTC  Major  Side Fan Tray 7 Failure
2010-11-11 20:27:13 UTC  Minor  Side Fan Tray 7 Overspeed
2010-11-11 20:27:13 UTC  Major  Side Fan Tray 5 Failure
2010-11-11 20:27:13 UTC  Major  Side Fan Tray 0 Failure
```

show chassis alarms (MX104 Router)

```
user@host >show chassis alarms
1 alarms currently active
Alarm time               Class  Description
2013-06-05 14:43:31 IST  Minor  Backup RE Active
```

show chassis alarms (MX2010 Router)

```
user@host> show chassis alarms
7 alarms currently active
Alarm time               Class  Description
2012-08-07 00:46:06 PDT  Major  Fan Tray 2 Failure
2012-08-06 18:24:36 PDT  Minor  Redundant feed missing for PSM 6
2012-08-06 07:41:04 PDT  Minor  Redundant feed missing for PSM 8
2012-08-04 02:42:06 PDT  Minor  Redundant feed missing for PSM 5
2012-08-03 21:14:24 PDT  Minor  Loss of communication with Backup RE
2012-08-03 12:26:03 PDT  Minor  Redundant feed missing for PSM 4
2012-08-03 10:40:18 PDT  Minor  Redundant feed missing for PSM 7
```

show chassis alarms (MX2020 Router)

```
user@host> show chassis alarms
1 alarms currently active
Alarm time Class Description
2012-10-03 12:14:59 PDT Minor Plane 0 not online
```

show chassis alarms (MX960, MX480, and MX240 Routers showing Major CB Failure)

A major CB 0 failure alarm occurs in the event of a bad CB (unknown or mismatched CBs do not trigger this alarm in Junos Release OS 12.3R9 and later). Following GRES or recovery, if the hardware issue persists, the traffic moves to the good CB and continues. If the alarm was triggered by something transient like a power zone budget on GRES, bringing the CB back online can clear the alarm. Otherwise, replace the bad CB. Note that fabric link speed is not impacted by an offline SCB. The alarm migh be raised on CB0, CB1, and CB2.

```
user@host> show chassis alarms
6 alarms currently active
Alarm time               Class  Description
2014-10-31 16:49:41 EDT  Major  PEM 3 Not OK
2014-10-31 16:49:41 EDT  Major  PEM 2 Not OK
2014-10-31 16:49:31 EDT  Major  CB 0 Failure
2014-10-31 16:49:31 EDT  Minor  CB 0 Fabric Chip 0 Not Online
2014-10-31 16:49:31 EDT  Minor  CB 0 Fabric Chip 1 Not Online
2014-10-31 16:49:31 EDT  Minor  Backup RE Active
```

show chassis alarms (T4000 Router)

```
user@host> show chassis alarms
9 alarms currently active
Alarm time               Class  Description
2007-06-02 01:41:10 UTC  Minor  RE 0 Not Supported
2007-06-02 01:41:10 UTC  Minor  CB 0 Not Supported
2007-06-02 01:41:10 UTC  Minor  Mixed Master and Backup RE types
2007-05-30 19:37:33 UTC  Major  SPMB 1 not online
2007-05-30 19:37:29 UTC  Minor  Front Bottom Fan Tray Absent
2007-05-30 19:37:13 UTC  Major  PEM 1 Input Failure
2007-05-30 19:37:13 UTC  Major  PEM 0 Not OK
2007-05-30 19:37:03 UTC  Major  PEM 0 Improper for Platform
2007-05-30 19:37:03 UTC  Minor  Backup RE Active
```

show chassis alarms (Unreachable Destinations Present on a T Series Router)

```
user@host> show chassis alarms
10 alarms currently active
Alarm time               Class  Description
2011-08-30 18:43:53 PDT  Major  FPC 7 has unreachable destinations
2011-08-30 18:43:53 PDT  Major  FPC 5 has unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 3 has unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 2 has unreachable destinations
2011-08-30 18:43:52 PDT  Minor  SIB 0 Not Online
2011-08-30 18:43:33 PDT  Minor  SIB 4 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 3 Not Online
2011-08-30 18:43:05 PDT  Minor  SIB 2 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 1 Not Online
2011-08-30 18:43:05 PDT  Major  PEM 1 Not Ok
```

show chassis alarms (FPC Offline Due to Unreachable Destinations on a T Series Router)

```
user@host> show chassis alarms
10 alarms currently active
Alarm time               Class  Description
2011-08-30 18:43:53 PDT  Major  FPC 7 offline due to unreachable destinations
2011-08-30 18:43:53 PDT  Major  FPC 5 offline due to unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 3 offline due to unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 2 offline due to unreachable destinations
2011-08-30 18:43:52 PDT  Minor  SIB 0 Not Online
2011-08-30 18:43:33 PDT  Minor  SIB 4 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 3 Not Online
2011-08-30 18:43:05 PDT  Minor  SIB 2 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 1 Not Online
2011-08-30 18:43:05 PDT  Major  PEM 1 Not Ok
```

show chassis alarms (SCG Absent on a T Series Router)

```
user@host> show chassis alarms
4 alarms currently active
Alarm time               Class  Description
2011-01-23 21:42:46 PST  Major  SCG 0 NO EXT CLK MEAS-BKUP SCG ABS
```

show chassis alarms (Alarms Active on a TX Matrix Router)

```
user@host> show chassis alarms
scc-re0:
--------------------------------------------------------------------------
8 alarms currently active
Alarm time               Class  Description
2004-08-05 18:43:53 PDT  Minor  LCC 0 Minor Errors
2004-08-05 18:43:53 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:52 PDT  Major  SIB 2 Absent
2004-08-05 18:43:52 PDT  Major  SIB 1 Absent
2004-08-05 18:43:52 PDT  Major  SIB 0 Absent
2004-08-05 18:43:33 PDT  Major  LCC 2 Major Errors
2004-08-05 18:43:28 PDT  Major  LCC 0 Major Errors
2004-08-05 18:43:05 PDT  Minor  LCC 2 Minor Errors
lcc0-re0:
--------------------------------------------------------------------------
5 alarms currently active
Alarm time               Class  Description
2004-08-05 18:43:53 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:49 PDT  Major  SIB 2 Absent
2004-08-05 18:43:49 PDT  Major  SIB 1 Absent
2004-08-05 18:43:49 PDT  Major  SIB 0 Absent
2004-08-05 18:43:28 PDT  Major  PEM 0 Not OK
lcc2-re0:
--------------------------------------------------------------------------
5 alarms currently active
Alarm time               Class  Description
2004-08-05 18:43:35 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:33 PDT  Major  SIB 2 Absent
2004-08-05 18:43:33 PDT  Major  SIB 1 Absent
2004-08-05 18:43:33 PDT  Major  SIB 0 Absent
2004-08-05 18:43:05 PDT  Minor  PEM 1 Absent
```

show chassis alarms (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis alarms
sfc0-re0:
--------------------------------------------------------------------------
Alarm time               Class  Description

2014-04-08 14:35:13 IST  Minor  FPM 0 SFC Config Size Changed
2014-04-08 14:32:58 IST  Major  Fan Tray Failure
2014-04-08 14:31:53 IST  Major  SIB F13 6 Fault
2014-04-08 14:31:43 IST  Major  SIB F13 11 Fault
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 14 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 8 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 3 Fbr Cbl
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 15 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 14 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 14
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 10 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 8 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 8
```



```
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 7 fault
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 4 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 3 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 3
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 14 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 12 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 8 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 6 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 4 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 2 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 0 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 14 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 14
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 12 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 12
2014-04-08 14:31:08 IST  Major  SIB F13 6 CXP 10 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 8 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 8
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 6 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 6
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 4 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 4
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 2 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 2
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 0 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 0
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 14 XC HSL Link Error
2014-04-08 14:29:27 IST  Minor  LCC 0 Minor Errors
2014-04-08 14:28:37 IST  Major  LCC 0 Major Errors
2014-04-08 14:28:37 IST  Major  LCC 2 Major Errors
2014-04-08 14:28:37 IST  Minor  LCC 2 Minor Errors
2014-04-08 14:28:24 IST  Major  SIB F2S 4/6 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 4/4 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 4/2 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 4/0 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 3/6 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 3/4 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 3/2 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 3/0 Absent
2014-04-08 14:28:24 IST  Major  SIB F13 9 Absent
2014-04-08 14:28:24 IST  Major  SIB F13 8 Absent
2014-04-08 14:28:24 IST  Major  SIB F13 7 Absent
2014-04-08 14:28:24 IST  Major  SIB F13 4 Absent
2014-04-08 14:28:24 IST  Major  SIB F13 1 Absent
2014-04-08 14:28:22 IST  Major  PEM 0 Input Failure
2014-04-08 14:28:22 IST  Major  PEM 0 Not OK

lcc0-re0:
--------------------------------------------------------------------------
12 alarms currently active
Alarm time               Class  Description
2014-04-08 14:36:08 IST  Minor  CB 1  M/S Switch Changed
2014-04-08 14:36:08 IST  Minor  CB 1  CHASSIS ID Changed
2014-04-08 14:35:43 IST  Minor  CB 0  M/S Switch Changed
2014-04-08 14:35:43 IST  Minor  CB 0  CHASSIS ID Changed
2014-04-08 14:29:30 IST  Minor  SIB 4 Not Online
2014-04-08 14:29:30 IST  Minor  SIB 3 Not Online
2014-04-08 14:29:30 IST  Minor  SIB 2 Not Online
2014-04-08 14:29:24 IST  Major  Rear Fan Tray Failure
2014-04-08 14:29:24 IST  Major  Front Bottom Fan Tray Improper for Platform
2014-04-08 14:29:24 IST  Major  Front Top Fan Tray Improper for Platform
```



```
2014-04-08 14:28:37 IST  Major  SIB 4 Absent
2014-04-08 14:28:37 IST  Major  SIB 3 Absent

lcc2-re0:
--------------------------------------------------------------------------
12 alarms currently active
Alarm time               Class  Description
2014-04-08 14:36:02 IST  Minor  CB 1  M/S Switch Changed
2014-04-08 14:36:02 IST  Minor  CB 1  CHASSIS ID Changed
2014-04-08 14:35:42 IST  Minor  CB 0  M/S Switch Changed
2014-04-08 14:34:42 IST  Minor  CB 0  CHASSIS ID Changed
2014-04-08 14:29:29 IST  Minor  SIB 0 CXP 7 Unsupported Optics
2014-04-08 14:29:27 IST  Major  Front Bottom Fan Tray Improper for Platform
2014-04-08 14:29:27 IST  Major  Front Top Fan Tray Improper for Platform
2014-04-08 14:29:25 IST  Minor  SIB 4 Not Online
2014-04-08 14:29:25 IST  Minor  SIB 3 Not Online
2014-04-08 14:28:47 IST  Major  PEM 0 Not OK
2014-04-08 14:28:36 IST  Major  SIB 2 Absent
2014-04-08 14:28:36 IST  Minor  Host 0 Boot from alternate media

lcc6-re0:
--------------------------------------------------------------------------
2 alarms currently active
Alarm time               Class  Description
2013-11-06 04:03:56 PST  Minor  SIB 1 CXP 0 XC HSL Link Error
2013-11-06 03:49:32 PST  Major  PEM 1 Not OK
```

show chassis alarms (Alarms on a T4000 Router After the enhanced-mode Statement is Enabled)

To enable improved virtual private LAN service (VPLS) MAC address learning on T4000 routers, you must include the **enhanced-mode** statement at the **[edit chassis network-services]** hierarchy level and reboot the router. When router reboots, only the T4000 Type 5 FPCs are required to be present on the router. If there are any other FPCs (apart from T4000 Type 5 FPCs) on the T4000 router, such FPCs become offline, and FPC misconfiguration alarms are generated. The **show chassis alarm** command output displays FPC misconfiguration (**FPC *fpc-slot* misconfig**) as the reason for the generation of the alarms.

```
user@host> show chassis alarms
2 alarms currently active
  Alarm time               Class  Description
  2011-10-22 10:10:47 PDT  Major  FPC 1 misconfig
  2011-10-22 10:10:46 PDT  Major  FPC 0 misconfig
```

show chassis alarms (Backup Routing Engine)

```
user@host> show chassis alarms
2 alarms are currently active
Alarm time               Class  Description
2005-04-07 10:12:22 PDT  Minor  Host 1 Boot from alternate media
2005-04-07 10:11:54 PDT  Major  Host 1 compact-flash missing in Boot List
```

show chassis alarms (EX Series Switch)

```
user@switch> show chassis alarms
 4 alarms currently active
Alarm time               Class  Description
2014-03-12 15:36:09 UTC  Minor  Require a Fan Tray upgrade
2014-03-12 15:00:02 UTC  Major  PEM 0 Input Failure
```



```
2014-03-12 15:00:02 UTC  Major  PEM 0 Not OK
2014-03-12 14:59:51 UTC  Minor  Host 1 Boot from alternate media
```

show chassis alarms (Alarms Active on the QFX Series and OCX Series Switches)

```
user@switch> show chassis alarms
1 alarms currently active
Alarm time               Class  Description
2012-03-05 2:10:24 UTC  Major  FPC 0 PEM 0 Airflow not matching Chassis Airflow
```

show chassis alarms node-device (Alarms Active on the QFabric System)

```
user@switch> show chassis alarms node-device ED3691
node-device ED3694
3 alarms currently active
Alarm time               Class  Description
2011-08-24 16:04:15 UTC  Major  ED3694:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC  Major  ED3694:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC  Major  ED3694 PEM 0 is not supported/powered
```

show chassis alarms (Alarms Active on the QFabric System)

```
user@switch> show chassis alarms
IC-A0001:
--------------------------------------------------------------------------
1 alarms currently active
Alarm time               Class  Description
2011-08-24 16:04:15 UTC  Minor  Backup RE Active

ED3694:
--------------------------------------------------------------------------
3 alarms currently active
Alarm time               Class  Description
2011-08-24 16:04:15 UTC  Major  ED3694:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC  Major  ED3694:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC  Major  ED3694 PEM 0 is not supported/powered

SNG-0:
--------------------------------------------------------------------------

NW-NG-0:
--------------------------------------------------------------------------
1 alarms currently active
Alarm time               Class  Description
2011-08-24 15:49:27 UTC  Major  ED3691 PEM 0 is not supported/powered
```

show chassis alarms (Alarms Active on an EX8200 Switch)

```
user@switch> show chassis alarms

6 alarms currently active
Alarm time               Class  Description
2010-12-02 19:15:22 UTC  Major  Fan Tray Failure
2010-12-02 19:15:22 UTC  Major  Fan Tray Failure
2010-12-02 19:15:14 UTC  Minor  Check CB 0 Fabric Chip 1 on Plane/FPC/PFE: 1/5/0,
 1/5/1, 1/5/2, 1/5/3, 1/7/0, 1/7/1, 1/7/2, 1/7/3, 2/5/0, 2/5/1, ...
2010-12-02 19:15:14 UTC  Minor  Check CB 0 Fabric Chip 0 on Plane/FPC/PFE: 1/5/0,
 1/5/1, 1/5/2, 1/5/3, 1/7/0, 1/7/1, 1/7/2, 1/7/3, 2/5/0, 2/5/1, ...
2010-12-02 19:14:18 UTC  Major  PSU 1 Output Failure
2010-12-02 19:14:18 UTC  Minor  Loss of communication with Backup RE
```

show chassis alarms (Alarms Active on a PTX5000 Packet Transport Router)

```
user@host> show chassis alarms

23 alarms currently active
Alarm time                Class  Description
2011-07-12 16:22:05 PDT  Minor  No Redundant Power for Rear Chassis
2011-07-12 16:22:05 PDT  Major  PDU 0 PSM 1 Not OK
2011-07-12 16:21:57 PDT  Minor  No Redundant Power for Fan 0-2
2011-07-12 16:21:57 PDT  Major  PDU 0 PSM 0 Not OK
2011-07-12 15:56:06 PDT  Major  PDU 1 PSM 2 Not OK
2011-07-12 15:56:06 PDT  Minor  No Redundant Power for FPC 0-7
2011-07-12 15:56:06 PDT  Major  PDU 0 PSM 3 Not OK
2011-07-12 15:28:20 PDT  Major  PDU 0 PSM 2 Not OK
2011-07-12 15:19:14 PDT  Minor  Backup RE Active
```

show chassis alarms (Mix of PDUs Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A)

All PDUs installed on a PTX5000 router must be of the same type. The **Mix of PDUs** or **Power Manager Non Operational** alarm is raised when different types of PDUs are installed on a PTX5000 router.

```
user@host> show chassis alarms
15 alarms currently active
Alarm time                Class  Description
2013-03-19 23:03:53 PDT  Minor  No Redundant Power
2013-03-19 23:03:48 PDT  Minor  Mix of PDUs
2013-03-19 23:03:47 PDT  Minor  PDU 1 PSM 3 Absent
2013-03-19 23:03:47 PDT  Minor  PDU 1 PSM 2 Absent
2013-03-19 23:03:47 PDT  Minor  PDU 1 PSM 1 Absent
2013-03-19 23:03:47 PDT  Minor  PDU 1 PSM 0 Absent
2013-03-19 23:03:46 PDT  Major  No CG Online
```

show chassis alarms (PDU Converter Failed Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A)

The **PDU Converter Failed** alarm is raised when one or more 36 V booster converter of a DC PDU fails. If two or more 36 V booster converter fails, fan trays fail and the router might get over heated. Therefore, when this alarm is raised, check the PDU and replace it, if required.

```
user@host> show chassis alarms
11 alarms currently active
Alarm time                Class  Description
2013-12-11 22:14:13 PST  Minor  No Redundant Power for System
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 7 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 6 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 5 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 4 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 3 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 2 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 1 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 0 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 Not OK
2013-12-11 22:14:01 PST  Major  PDU 0 Converter Failed
```

show chassis alarms (No Power for System Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis alarms
8 alarms currently active
Alarm time                Class  Description
```

```
2013-11-19 01:58:41 PST  Major  No Power for System
2013-11-19 01:58:37 PST  Major  PDU 0 PSM 1 Not OK
2013-11-19 01:56:46 PST  Major  PDU 0 PSM 2 Not OK
2013-11-19 01:54:26 PST  Major  PDU 0 PSM 3 Not OK
2013-11-19 01:53:30 PST  Major  PDU 1 PSM 3 Not OK
2013-11-19 01:53:29 PST  Major  PDU 1 PSM 2 Not OK
2013-11-19 01:53:29 PST  Major  PDU 1 PSM 1 Not OK
2013-11-19 01:53:29 PST  Major  PDU 1 PSM 0 Not OK
```

show chassis alarms (Alarms Active on an ACX2000 Universal Access Router)

```
user@host> show chassis alarms
7 alarms currently active
Alarm time               Class  Description
2012-05-22 11:19:09 UTC  Major  xe-0/3/1: Link down
2012-05-22 11:19:09 UTC  Major  xe-0/3/0: Link down
2012-05-22 11:19:09 UTC  Major  ge-0/1/7: Link down
2012-05-22 11:19:09 UTC  Major  ge-0/1/6: Link down
2012-05-22 11:19:09 UTC  Major  ge-0/1/3: Link down
2012-05-22 11:19:09 UTC  Major  ge-0/1/2: Link down
2012-05-22 11:19:09 UTC  Major  ge-0/1/1: Link down
```

show chassis alarms (Active Alarm to Indicate Status of the Bad SCB Clock on MX Series)

```
user@host> show chassis alarms
1 alarm currently active
Alarm time               Class  Description
2013-08-06 07:48:35 PDT  Major  CB 0 19.44 MHz clock failure
```


show chassis 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 620
- *Configuring CFEB Redundancy on the M10i Router*
- *CFEB Overview*

List of Sample Output

show chassis cfeb (M7i) on page 700
show chassis cfeb (M10i) on page 700

Output Fields

Table 43 on page 699 lists the output fields for the **show chassis cfeb** command. Output fields are listed in the approximate order in which they appear.

Table 43: show chassis cfeb Output Fields

Field Name	Field Description
State	Status of the CFEB: • **Online**—CFEB is online and running. • **Offline**—CFEB is powered down.
Intake Temperature	Temperature of the air before flowing past the CFEB.
Exhaust Temperature	Temperature of the air after flowing past the CFEB.
CPU utilization	Percentage of CPU being used by the CFEB processor.
Interrupt utilization	Of the total CPU being used by the CFEB processor, the percentage being used for interrupts
Heap Utilization	Percentage of heap space (dynamic memory) being used by the CFEB processor. If this number exceeds 80 percent, there may be a software problem (memory leak).
Buffer Utilization	Percentage of buffer space being used by the CFEB processor for buffering internal messages
Total CPU DRAM	Amount of DRAM available to the CFEB CPU.

Table 43: show chassis cfeb Output Fields *(continued)*

Field Name	Field Description
Internet Processor II	Information about the CFEB processor.
Start time	Time when the Routing Engine detected that the CFEB was running.
Uptime	How long the Routing Engine has been connected to the CFEB and, therefore, how long the Flexible PIC Concentrator (FPC) has been up and running.

Sample Output

show chassis cfeb (M7i)

```
user@host> show chassis cfeb
CFEB status:
  State                          Online
  Intake Temperature          27 degrees C / 80 degrees F
  Exhaust Temperature         33 degrees C / 91 degrees F
  CPU utilization              3 percent
  Interrupt utilization        0 percent
  Heap utilization             8 percent
  Buffer utilization          21 percent
  Total CPU DRAM             128 MB
  Internet Processor II          Version 1, Foundry IBM, Part number 164
  Start time:                    2003-06-11 11:41:22 PDT
  Uptime:                        1 hour, 39 minutes, 31 seconds
```

show chassis cfeb (M10i)

```
user@host> show chassis cfeb
CFEB status:
Slot 0 information:
  StateMaster
  Intake temperature                 35 degrees C / 95 degrees F
  Exhaust temperature                43 degrees C / 109 degrees F
  CPU utilization                     3 percent
  Interrupt utilization               0 percent
  Heap utilization                   10 percent
  Buffer utilization                 22 percent
  Total CPU DRAM                    128 MB
  Internet Processor II                 Version 1, Foundry IBM, Part number 164
  Start time:                           2004-11-01 03:24:15 PST
  Uptime:                              12 hours, 56 minutes, 18 seconds
Slot 1 information:
  State                                 Backup
```


show chassis cip

Syntax (TX Matrix Plus Router) show chassis cip

Release Information Command introduced in Junos OS Release 9.6.

Description (TX Matrix Plus routers only) Display environmental information about the Connector Interface Panel (CIP) that provides Ethernet Control Plane connectivity to line-card chassis (LCCs), switch fabric chassis, and other devices.

Options This command has no options.

Required Privilege Level view

Related Documentation

- request chassis cip on page 621
- *Installing a T1600 CIP*
- *Installing a T640 CIP*
- *Installing a TX-CIP*
- *Installing an M320 CIP*
- *Installing an M320 CIP*
- *Installing the T320 CIP*
- *CIP Overview*

Output Fields Table 44 on page 701 lists the output fields for the **show chassis cip** command. Output fields are listed in the approximate order in which they appear.

Table 44: show chassis cip Output Fields

Field Name	Field Description
Eswitch	Ethernet switch used to connect to the LCC or to a JCS1200: **0** or **1**.
Port	Physical port number of the Ethernet switch: • Port numbers: **4** to **8** on Ethernet switch **0** can be used to connect up to four (reserved for future use) other SFCs or optional JCS1200s. NOTE: The current configuration of the routing matrix based on a TX Matrix Plus router supports only one SFC. • Port numbers **0** to **15** on Ethernet switch **1** can be used to connect up to 16 LCCs. NOTE: The current configuration of a routing matrix based on a TX Matrix Plus router supports only up to eight LCCs. You can connect LCCs to the port numbers corresponding to LCC0 to LCC7 (**0** to **15)** on the Ethernet switch **1**.

Table 44: show chassis cip Output Fields *(continued)*

Field Name	Field Description
Type	Type of CIP: • **XE**—Ethernet switch **0** ports used for connections to the SFC control plane or other devices such as JCS1200. • **GE**—Ethernet switch **1** ports used for connections to the LCC control plane.
Connected-to	Show control plane connection to a specific LCC or SFC.
Link	State of the connection to an LCC control plane, SFC control plane, or other devices: **Up** or **Down.**
Speed	Ethernet link speed.
Duplex	Type of Ethernet link: **Full** or **Half Duplex**.
Auto-neg	Status of autonegotiation for the CIP connection to the LCC, SFC, or other devices: **On** or **Off**.

show chassis cip (TX Matrix Plus Router)

```
user@host> show chassis cip
sfc0-cip0
Eswitch Port Type Connected-to     Link  Speed        Duplex Auto-Neg
0        4    XE   SFC1            Down  0            Full   Off
0        5    XE   SFC0            Down  0            Full   Off
0        6    XE   SFC3            Down  0            Full   Off
0        7    XE   SFC2            Down  0            Full   Off
0        8    XE   SFC4            Down  0            Full   Off
1        0    GE   LCC0            Up    1000Mbps     Full   On
1        1    GE   LCC8            Down  0            Half   On
1        2    GE   LCC1            Up    1000Mbps     Full   On
1        3    GE   LCC9            Down  0            Half   On
1        4    GE   LCC2            Up    1000Mbps     Full   On
1        5    GE   LCC10           Down  0            Half   On
1        6    GE   LCC3            Up    1000Mbps     Full   On
1        7    GE   LCC11           Down  0            Half   On
1        8    GE   LCC4            Down  0            Half   On
1        9    GE   LCC12           Down  0            Half   On
1        10   GE   LCC5            Down  0            Half   On
1        11   GE   LCC13           Down  0            Half   On
1        12   GE   LCC6            Down  0            Half   On
1        13   GE   LCC14           Down  0            Half   On
1        14   GE   LCC7            Down  0            Half   On
1        15   GE   LCC15           Down  0            Half   On
1        16   GE   GE17            Up    1000Mbps     Full   On
1        17   GE   GE16            Down  0            Half   On
```


show chassis craft-interface

List of Syntax

Syntax

show chassis craft-interface

Syntax (MX Series Routers)

show chassis craft-interface
<all-members>
<local>
<member *member-id*>

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis craft-interface

Syntax (TX Matrix Routers)

show chassis craft-interface
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis craft-interface
<lcc *number* | sfc *number*>

Syntax (ACX Series Universal Access Routers)

show chassis craft-interface

Release Information

Command introduced before Junos OS Release 7.4.
sfc option for the TX Matrix Plus router introduced in Junos OS Release 9.6.
Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.

Description

For routers or switches that have a display on the craft interface, show the messages that are currently displayed. On all routers except for the M20 router, you must enter this command on the master Routing Engine.

Options

none—(TX Matrix, TX Matrix Plus routers, MX104, MX2010, and MX2020 routers, and ACX Series routers only) On a TX Matrix router, show messages that are currently displayed on the craft interface on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, show messages that are currently displayed on the craft interface on the TX Matrix Plus router and its attached routers.

all-members—(MX Series routers only) (Optional) Display information currently on the craft interface for all members of the Virtual Chassis configuration.

lcc *number*—(TX Matrix, TX Matrix Plus routers only) (Optional) On a TX Matrix router, show messages that are currently displayed on the craft interface for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, show messages that are currently displayed on the craft interface for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display information currently on the craft interface for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display information currently on the craft interface for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

scc—(TX Matrix router only) (Optional) Show messages that are currently displayed on the craft interface for the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus router only) (Optional) Show messages that are currently displayed on the craft interface for the respective TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with **0**.

Required Privilege Level

view

Related Documentation

- clear chassis display message on page 611
- set chassis display message on page 674

List of Sample Output

show chassis craft-interface (M20 Router) on page 706
show chassis craft-interface (M40 Router) on page 706
show chassis craft-interface (M120 Router) on page 707
show chassis craft-interface (M160 Router) on page 707
show chassis craft-interface (MX104 Router) on page 708
show chassis craft-interface (MX2010 Router) on page 709
show chassis craft-interface (MX2020 Router) on page 709
show chassis craft-interface (T4000 Router) on page 710
show chassis craft-interface (TX Matrix Routing Matrix) on page 711
show chassis craft-interface (TX Matrix Plus Routing Matrix) on page 713

show chassis craft-interface (TX Matrix Plus router with 3D SIBs) on page 716
show chassis craft-interface (ACX2000 Universal Access Router) on page 718

Output Fields Table 45 on page 705 lists the output fields for the **show chassis craft-interface** command. Output fields are listed in the approximate order in which they appear.

Table 45: show chassis craft-interface Output Fields

Field Name	Field Description
LCD screen or **FPM Display Contents**	Contents of the Front Panel Module display: • *router-name*—Name of the router. • **Up**—How long the router has been operational, in days, hours, minutes, and seconds. • *message*—Information about the router traffic load, the power supply status, the fan status, and the temperature status. The display of this information changes every 2 seconds. If a text message has been created with the **set chassis display** command, this message appears on all four lines of the craft interface display. The display alternates between the text message and the standard system status messages every 2 seconds.
SFC Front Panel Switch Settings	(TX Matrix Plus Routers)—Display the SFC front panel switch settings: **SFC Chassis Number** and **Config Size** are settings on physical switches located on the left side of the craft interface of the TX Matrix Plus router. • **SFC Chassis Number**—This field always displays the value **00**. • **Config Size**—The value of this field is **0** for the TX Matrix Plus router. The value of this filed is **3** for TX Matrix Plus router with 3D SIBs.
Front Panel System LEDs	(MX104, MX2010, and MX2020 Routers) Status of the Front Panel System LEDs. A dot (**.**) indicates the LED is not lit. An asterisk (*****) indicates the LED is lit.
Front Panel Alarm Indicators	(MX104, MX2010, and MX2020 Routers) Status of the Front Panel Alarm indicators. A dot (**.**) indicates the relay is off. An asterisk (*****) indicates the relay is active.
Input Relay	Status of the configured input relay ports—0 through 3. The mode is normally open or closed. The status is clear or raised.
Output Relay	Status of the configured output ports—0 or 1. The mode is normally open or closed. The status is clear or raised.
Front Panel FPC LEDs	(MX2010 and MX2020 Routers) Status of the Front Panel Flexible PIC Concentrator (FPC) LEDs. A dot (**.**) indicates the LED is not lit. An asterisk (*****) indicates the LED is lit. On MX2010 routers, there are 10 (0-9) FPCs LEDs. On MX2020 routers, there are 20 (0-9 and 10-19) FPCs LEDs.
CB LEDs	Status of the Control Board (CB) LEDs. A dot (**.**) indicates the LED is not lit. An asterisk (*****) indicates the LED is lit.
PS LEDs	(MX2010 and MX2020 Routers) Status of the Power Supply (PS) LEDs. A dot (**.**) indicates the LED is not lit. An asterisk (*****) indicates the LED is lit. On MX2010 routers, there are 9 (0-8) PS LEDs. On MX2020 routers, there are 18 (0-8 and 9-17) PS LEDs.
PS Status	(MX104 Routers) Status of the Power Supply (PS). Green indicates that the power supply is functioning. Red indicates that the power supply is not functioning. A dot (**.**) indicates the LED is not lit. An asterix (*****) indicates the LED is lit.

Table 45: show chassis craft-interface Output Fields *(continued)*

Field Name	Field Description
FAN Tray LEDs	(MX2010 and MX2020 Routers) Status of the Fan Tray LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
Front Panel SFB LEDs	(MX2010 and MX2020 Routers) Status of the Front Panel Switch Fabric Boards (SFB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
Front Panel Chassis Info	(MX2010 and MX2020 Routers) Information about the chassis such as the chassis number and role. User can set the chassis number in multi-chassis configurations.
MCS and SFM LEDs	Status of the Miscellaneous Control Subsystem (MCS) and Switching and Forwarding Module (SFM) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit. When neither a dot nor an asterisk is displayed, there is no board in that slot.
SIB LEDs	Status of the Switch Interface Board (SIB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
SCG LEDs	Status of the SONET Clock Generator (SCG) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.

Sample Output

show chassis craft-interface (M20 Router)

```
user@host> show chassis craft-interface
Red alarm:     LED off, relay off
Yellow alarm:  LED on, relay on
Host OK LED:   On
Host fail LED: Off
FPCs     0  1  2  3
-------------------
Green  .  *  *.
Red    ....
LCD screen:
     +--------------------+
     |host                |
     |1 Alarm active      |
     |Y: FERF             |
     |                    |
     +--------------------+
```

show chassis craft-interface (M40 Router)

```
user@host> show chassis craft-interface
Front Panel LCD Display: enabled
Red alarm:     LED off, relay off
Yellow alarm:  LED off, relay off
Host OK LED:   On
Host Fail LED: Off
NICs    0  1  2  3  4  5  6  7
-------------------------------
Green   *.  *.  *.  *.
Red   ........
LCD Screen:
```



```
+--------------------+
|host                |
|Up: 27+18:52:37     |
|                    |
|52.649kpps Load     |
+--------------------+
```

show chassis craft-interface (M120 Router)

```
user@host> show chassis craft-interface
Front Panel System LEDs:
Routing Engine    0    1
--------------------------
OK                *    .
Fail              .    .
Master            *    .

Front Panel Alarm Indicators:
-----------------------------
Red LED      *
Yellow LED   .
Major relay  *
Minor relay  .

Front Panel FPC LEDs:
FPC    0   1   2   3   4   5
----------------------------
Red    .   .   .   .   .   .
Green  .   *   .   *   *   *

CB LEDs:
 CB    0   1
--------------
Amber  .   .
Green  *   *

PS LEDs:
  PS   0   1
------------------------
Red    .   .
Green  *   *

FEB LEDs:
  FEB  0   1   2   3   4   5
------------------------------
Red    .   .   .   .   .   .
Green  .   .   .   *   *   *
Active .   .   .   *   *   *
```

show chassis craft-interface (M160 Router)

```
user@host> show chassis craft-interface
FPM Display contents:
    +--------------------+
    |hosts               |
    |Up: 1+16:46         |
    |                    |
    |Fans OK             |
    +--------------------+

Front Panel System LEDs:
```

```
Host     0    1
------------------------
OK      .    *
Fail    .  .
Master .    *

Front Panel Alarm Indicators:
-----------------------------
Red LED     .
Yellow LED .
Major relay.
Minor relay.

Front Panel FPC LEDs:
FPC    0   1   2   3   4   5   6   7
------------------------------------
Red  . . . . . . . .
Green  *   * . . . . . .

MCS and SFM LEDs:
MCS    0   1      SFM    0   1   2   3
--------------------------------------
Amber    .           . .
Green    .           . .
Blue       *             *   *
```

show chassis craft-interface (MX104 Router)

```
user@host > show chassis craft-interface
Front Panel System LEDs:
Routing Engine    0    1
--------------------------------------
OK                *    .
Fail              .    .
Master            *    .

Front Panel Alarm Indicators:
--------------------------------------
Red LED        .
Yellow LED   *
Major relay  .
Minor relay  *

Input relay:
--------------------------------------
Port    Mode    Status
 0      Open    Clear
 1      Open    Clear
 2      Open    Clear
 3      Open    Clear

Output relay:
--------------------------------------
Port    Mode    Status
 0      Open    Clear
 1      Open    Clear

PS Status:
  PS   0    1
--------------------------------------
```



```
Red     .   .
Green  *    .
```

show chassis craft-interface (MX2010 Router)

```
user@host > show chassis craft-interface
Front Panel System LEDs:
Routing Engine    0    1
--------------------------
OK                *    .
Fail              .    *
Master            *    .

Front Panel Alarm Indicators:
-----------------------------
Red LED      .
Yellow LED   *
Major relay  .
Minor relay  *

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5    6    7    8    9
-----------------------------------------------------
Red    .    .    .    .    .    .    .    .    .    .
Green  *    *    .    .    .    .    .    .    *    *

CB LEDs:
 CB    0   1
------------
Amber  .   .
Green  *   *

PS LEDs:
  PS    0    1    2    3    4    5    6    7    8
-------------------------------------------------
Red     .    .    .    .    .    .    .    .    .
Green   .    .    .    .    *    *    *    *    *

Fan Tray LEDs:
  FT   0   1   2   3
--------------------
Red    .   .   .   .
Green  *   *   *   *

Front Panel SFB LEDs:
SFB    0   1   2   3   4   5   6   7
------------------------------------
Red    .   .   .   .   .   .   .   .
Green  *   *   *   *   *   *   *   *

Front Panel Chassis Info:
Chassis Number    0x0
Chassis Role      S
```

show chassis craft-interface (MX2020 Router)

```
user@host > show chassis craft-interface
Front Panel System LEDs:
Routing Engine 0 1
--------------------------
```

```
OK * *
Fail . .
Master * .
Front Panel Alarm Indicators:
-----------------------------
Red LED .
Yellow LED .
Major relay .
Minor relay .
Front Panel FPC LEDs:
FPC 0 1 2 3 4 5 6 7 8 9
-----------------------------------------------------
Red . . . . . . . . . .
Green * * * * * * * * * *
Front Panel FPC LEDs:
FPC 10 11 12 13 14 15 16 17 18 19
------------------------------------------------------
Red . . . . . . . . . .
Green * * * * * * * * * *
CB LEDs:
CB 0 1
------------
Amber . .
Green * *
PS LEDs:
PS 0 1 2 3 4 5 6 7 8
-------------------------------------------------
Red . . . . . . . . .
Green * * * * * . . * *
PS LEDs:
PS 9 10 11 12 13 14 15 16 17
-------------------------------------------------
Red . . . . . . . . .
Green * * * * * * * * *
Fan Tray LEDs:
FT 0 1 2 3
--------------------
Red . . . .
Green * * * *
Front Panel SFB LEDs:
SFB 0 1 2 3 4 5 6 7
------------------------------------
Red . . . . . . . .
Green * * * * * * * *
Front Panel Chassis Info:
Chassis Number 0x57
Chassis Role M
```

show chassis craft-interface (T4000 Router)

```
user@host> show chassis craft-interface
FPM Display contents:
    +--------------------+
    |stymphalian         |
    |2 Alarms active     |
    |R: Front Top Fan Tra|
    |Y: PEM 1 Absent     |
    +--------------------|

Front Panel System LEDs:
Routing Engine    0    1
```



```
--------------------------
OK                 *    *
Fail               .    .
Master             *    .

Front Panel Alarm Indicators:
-----------------------------
Red LED      *
Yellow LED   *
Major relay  *
Minor relay  *

Front Panel FPC LEDs:
FPC    0   1   2   3   4   5   6   7
------------------------------------
Red    .   .   .   .   .   .   .   .
Green  *   .   .   *   .   *   *   .

CB LEDs:
  CB   0   1
--------------
Amber  .   .
Green  *   *
Blue   *   .

SCG LEDs:
  SCG  0   1
--------------
Amber  .   .
Green  *   *
Blue   *   .

SIB LEDs:
  SIB  0   1   2   3   4
--------------------------
Red    .   .   .   .   .
Green  *   *   *   *   *
```

show chassis craft-interface (TX Matrix Routing Matrix)

```
user@host> show chassis craft-interface
scc-re0:
--------------------------------------------------------------------------
FPM Display contents:
    +---------------------+
    |bradley              |
    |8 Alarms active      |
    |R: SIB 2 Absent      |
    |R: SIB 1 Absent      |
    +---------------------|

Front Panel System LEDs:
Routing Engine    0    1
--------------------------
OK                *  .
Fail            .  .
Master            *  .

Front Panel Alarm Indicators:
-----------------------------
Red LED      *
```

```
Yellow LED   *
Major relay  *
Minor relay  *

CB LEDs:
  CB   0   1
--------------
Amber. .
Green  * .
Blue   * .

SIB LEDs:
  SIB  0   1   2   3   4
--------------------------
Fail . . . . .
OK   . . . .   *
Active . . . .   *

lcc0-re0:
--------------------------------------------------------------------------
FPM Display contents:
    +--------------------+
    |hybrid              |
    |5 Alarms active     |
    |R: SIB 2 Absent     |
    |R: SIB 1 Absent     |
    +--------------------|
Front Panel System LEDs:
Routing Engine    0    1
--------------------------
OK                *  .
Fail            .  .
Master            *  .

Front Panel Alarm Indicators:
-----------------------------
Red LED      *
Yellow LED   *
Major relay  *
Minor relay  *

Front Panel FPC LEDs:
FPC    0   1   2   3   4   5   6   7
------------------------------------
Red  . . . . . . . .
Green.   *   * . . . . .

CB LEDs:
  CB   0   1
--------------
Amber. .
Green  * .
Blue   * .

SCG LEDs:
  SCG  0   1
--------------
Amber. .
Green  * .
Blue   * .
```



```
SIB LEDs:
  SIB  0   1   2   3   4
--------------------------
Red  . . . . .
Green. . . .   *

lcc2-re0:
--------------------------------------------------------------------------
FPM Display contents:
    +--------------------+
    |prius               |
    |5 Alarms active     |
    |R: SIB 2 Absent     |
    |R: SIB 1 Absent     |
    +--------------------|

Front Panel System LEDs:
Routing Engine    0    1
--------------------------
OK                 *  .
Fail             .  .
Master             *  .

Front Panel Alarm Indicators:
-----------------------------
Red LED      *
Yellow LED   *
Major relay  *
Minor relay  *

Front Panel FPC LEDs:
FPC    0   1   2   3   4   5   6   7
------------------------------------
Red  . . . . . . . .
Green  *   *   * . . . . .

CB LEDs:
  CB   0   1
--------------
Amber. .
Green  * .
Blue   * .

SCG LEDs:
  SCG  0   1
--------------
Amber. .
Green  * .
Blue   * .

SIB LEDs:
  SIB  0   1   2   3   4
--------------------------
Red  . . . . .
Green. . . .   *
```

show chassis craft-interface (TX Matrix Plus Routing Matrix)

```
user@host> show chassis craft-interface
sfc0-re0:
--------------------------------------------------------------------------
```

```
FPM Display Contents:
    +--------------------+
    |noname             |
    |12 Alarms active    |
    |R: SIB F13 12 Absent|
    |R: SIB F13 9 Absent |
    +--------------------+

SFC Front Panel Switch Settings:
SFC Chassis Number : 00
Config Size        : 1

Front Panel System LEDs:
Routing Engine    0    1
--------------------------
OK                *    *
Fail              .    .
Master            *    .

Front Panel Alarm Indicators:
-----------------------------
Red LED      *
Yellow LED   *
Major relay  *
Minor relay  *

Front Panel F13 SIB LEDs:
SIB    0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
---------------------------------------------------------------------
Fail   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
OK     *   .   .   *   .   .   *   .   *   .   .   *   .   .   .   .
Active .   .   .   *   .   .   *   .   *   .   .   *   .   .   .   .

PS LEDs:
  PS   0   1
------------
Red    .   *
Green  *   .

Fan Tray LEDs:
  FT   0   1   2   3   4   5
----------------------------
Red    .   .   .   .   *   *
Green  *   *   *   *   .   .

CB LEDs:
  CB   0   1
--------------
Amber  .   .
Green  *   *
Blue   *   .

lcc0-re0:
---------------------------------------------------------------------------
FPM Display contents:
    +--------------------+
    |noname1             |
    |1 Alarm active      |
    |R: PEM 1 Not OK     |
    |                    |
    +--------------------|
```



```
Front Panel System LEDs:
Routing Engine    0    1
--------------------------
OK                *    *
Fail              .    .
Master            *    .

Front Panel Alarm Indicators:
-----------------------------
Red LED      *
Yellow LED   .
Major relay  *
Minor relay  .

Front Panel FPC LEDs:
FPC    0   1   2   3   4   5   6   7
-----------------------------------
Red    .   .   .   .   .   .   .   .
Green  .   *   .   *   *   .   .   *

CB LEDs:
  CB   0   1
--------------
Amber  .   .
Green  *   *
Blue   *   .

SCG LEDs:
  SCG  0   1
--------------
Amber  .   .
Green  *   *
Blue   *   .

SIB LEDs:
  SIB  0   1   2   3   4
--------------------------
Red    .   .   .   .   .
Green  *   *   *   *   *

lcc1-re0:
--------------------------------------------------------------------------
FPM Display contents:
    +--------------------+
    |noname2             |
    |2 Alarms active     |
    |R: FPC 0 PIC 0 Failu|
    |R: PEM 1 Not OK     |
    +--------------------|

Front Panel System LEDs:
Routing Engine    0    1
--------------------------
OK                *    *
Fail              .    .
Master            *    .

Front Panel Alarm Indicators:
-----------------------------
Red LED      *
```

```
Yellow LED   .
Major relay  *
Minor relay  .

Front Panel FPC LEDs:
FPC    0   1   2   3   4   5   6   7
------------------------------------
Red    .   .   .   .   .   .   .   .
Green  *   *   *   .   .   *   .   .

CB LEDs:
  CB   0   1
--------------
Amber  .   .
Green  *   *
Blue   *   .

SCG LEDs:
  SCG  0   1
--------------
Amber  .   .
Green  *   *
Blue   *   .

SIB LEDs:
  SIB  0   1   2   3   4
--------------------------
Red    .   .   .   .   .
Green  *   *   *   *   *
```

show chassis craft-interface (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis craft-interface
sfc0-re0:
--------------------------------------------------------------------------
FPM Display Contents:
    +--------------------+
    |noname              |
    |48 Alarms active    |
    |R: LCC 2 Major Error|
    |R: LCC 0 Major Error|
    +--------------------+

SFC Front Panel Switch Settings:
SFC Chassis Number : 00
Config Size        : 3

Front Panel System LEDs:
Routing Engine    0    1
--------------------------
OK                *    *
Fail              .    .
Master            *    .

Front Panel Alarm Indicators:
-----------------------------
Red LED      *
Yellow LED   *
Major relay  *
Minor relay  *
```



```
Front Panel F13 SIB LEDs:
SIB    0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
--------------------------------------------------------------------
Fail   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
OK     *   .   .   *   .   .   *   .   .   .   .   .   .   .   .   .
Active *   .   .   *   .   .   *   .   .   .   .   .   .   .   .   .

PS LEDs:
  PS   0   1
------------
Red    *   .
Green  .   *

Fan Tray LEDs:
  FT   0   1   2   3   4   5
----------------------------
Red    .   .   .   .   .   *
Green  *   *   *   *   *   .

CB LEDs:
  CB   0   1
--------------
Amber  .   .
Green  *   *
Blue   *   .

lcc0-re0:
--------------------------------------------------------------------------
FPM Display contents:
    +--------------------+
    |noname1            |
    |14 Alarms active    |
    |R: PEM 1 Not OK     |
    |R: FPC 7 misconfig  |
    +--------------------|

Front Panel System LEDs:
Routing Engine    0    1
--------------------------
OK                *    *
Fail              .    .
Master            *    .

Front Panel Alarm Indicators:
-----------------------------
Red LED      *
Yellow LED   *
Major relay  *
Minor relay  *

Front Panel FPC LEDs:
FPC    0   1   2   3   4   5   6   7
------------------------------------
Red    .   .   .   .   .   .   .   .
Green  .   .   .   .   *   .   .   .

CB LEDs:
  CB   0   1
--------------
Amber  .   .
Green  *   *
```



```
Blue    *    .

SCG LEDs:
  SCG  0    1
--------------
Amber  .    .
Green  *    *
Blue   *    .

SIB LEDs:
  SIB  0    1    2    3    4
--------------------------
Red    .    .    .    .    .
Green  *    *    *    .    .
```

show chassis craft-interface (ACX2000 Universal Access Router)

```
user@host> show chassis craft-interface
Front Panel System LEDs:
Routing Engine
------------------
OK                  *
Fail                .

Front Panel Alarm Indicators:
-----------------------------
Red LED        .
Yellow LED     .
Major relay    .
Minor relay    .

Input relay:
------------
Port     Mode     Status
 0       Open     Clear
 1       Open     Clear
 2       Open     Clear
 3       Open     Clear

Output relay:
-------------
Port     Mode     Status
 0       Open     Clear
 1       Open     Clear

PS Status:
  PS    0    1
---------------
Red     .    .
Green   *    *
```


show chassis environment

List of Syntax

Syntax

show chassis environment

Syntax (T320, T640, T1600, and T4000 Routers)

show chassis environment
<cb *cb-slot-number*>
<fpc *fpc-slot-number*>
<fpm>
<pem *pem-slot-number*>
<routing-engine *re-slot-number*>
<scg *scg-slot-number*>
<sib *sib-slot-number*>

Syntax (TX Matrix Routers)

show chassis environment
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis environment
<cb *cb-slot-number*>
<cip *cip-slot-number*>
<fpc *fpc-slot-number*>
<fpm>
<lcc *number*>
<pem *pem-slot-number*>
<routing-engine *re-slot-number*>
<scg *scg-slot-number*>
< sfc *number*>
<sib *sib-slot-number*>

Syntax (MX Series Routers)

show chassis environment
<all-members>
<local>
<member *member-id*>

Syntax (MX104 3D Universal Edge Routers)

show chassis environment
<cb>
<pem *pem-slot-number*>
<routing-engine *re-slot-number*>

Syntax (MX2010 and MX2020 3D Universal Edge Routers)

show chassis environment
<adc *adc-slot-number*>
<cb *cb-slot-number*>
<fpc *fpc-slot-number*>
<fpm>
<monitored>
<psm *psm-slot-number*>
<routing-engine *re-slot-number*>
<sfb *sfb-slot-number*>

Syntax (EX8200 Switches)

show chassis environment
<all-members>
<cb *cb-slot-number*>
<fpc *fpc-slot-number*>
<local>
<member *member-id*>
<psu *psu-slot-number*>
<routing-engine *re-slot-number*>

Syntax (EX Series Switches except EX8200)

show chassis environment
<all-members>
<fpc *fpc-slot-number*>
<local>
<member *member-id*>
<power-supply-unit>
<routing-engine>

Syntax (QFX Series)

show chassis environment
<cb *slot-number* <interconnect-device *name*>>
<fpc *slot-number* <interconnect-device *name*>>
<interconnect-device *name* <*slot-number*>
<node-device *name*>
<pem *slot-number* (interconnect-device *name slot-number*) | (node-device *name*)>
<routing-engine *name* <interconnect-device *name slot-number*>>

Syntax (OCX Series)

show chassis environment

Syntax (PTX Series Packet Transport Routers)

show chassis environment
<cb *cb-slot-number*>
<ccg *ccg-slot-number* >
<fpc *fpc-slot-number*>
<fpm>
<monitored>
<pdu *pdu-slot-number*>
<routing-engine *re-slot-number*>
<sib *sib-slot-number*>

Syntax (ACX Series Universal Access Routers)

show chassis environment
<cb *cb-slot-number*>
<pem *pem-slot-number*>
<routing-engine *re-slot-number*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 11.1 for QFX Series.
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
monitored option added in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.1 for T4000 Core Routers.
Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
pem option introduced in Junos OS Release 12.3 for ACX4000 Universal Access Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display environmental information about the router or switch chassis, including the temperature and information about the fans, power supplies, and Routing Engine.

In addition, on ACX4000 routers, display temperature information about the different channels of a Modular Interface Card (MIC). The number of channels displayed depends on the type of MIC installed.

Starting with Junos OS Release 14.1, the **show chassis environment cb *cb-slot-number* | ccg *ccg-slot-number* | fpc *fpc-slot-number* | fpm | monitored | pdu *pdu-slot-number* | routing-engine *re-slot-number* | sib *sib-slot-number*** operational mode command output displays environmental information for the the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-P1A) and other components in a PTX5000 Packet Transport Router.

Options **none**—Display environmental information about the router or switch chassis. On a TX Matrix router, display environmental information about the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about the TX Matrix Plus router and its attached routers.

all-members—(MX Series routers and EX Series switches only) (Optional) Display chassis environmental information for all the members of the Virtual Chassis configuration.

adc *adc-slot-number*—(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the adapter cards. For MX2020 routers, replace ***adc-slot-number*** with a value from **0** through **19**. For MX2010 routers, replace ***adc-slot-number*** with a value from **0** through **9**.

cb *cb-slot-number*—(ACX Series Universal Access Routers, EX Series switches, M120, M320, and M40e routers, MX Series routers, MX2020 routers, MX2010 routers, PTX Series Packet Transport Routers, QFX Series, and T Series routers, and TX Matrix Plus routers only) (Optional) Display chassis environmental information for the Control Board. On devices other than EX Series switches, replace ***cb-slot*** with **0** or **1**. For the EX Series switches, see *EX Series Switches Hardware and CLI Terminology Mapping* for information on CB slot numbering.

cip ***cip-slot-number***—(TX Matrix Plus routers only) (Optional) Display chassis environmental information for the Connection Interface Panel (CIP). Replace the ***cip-slot-number*** variable with a value of **0** or **1**.

cb interconnect-device ***name***—(QFabric systems only) (Optional) Display chassis environmental information for the Control Board on an Interconnect device.

ccg ***ccg-slot-number***—(PTX Series only) (Optional) Display chassis environmental information for the Centralized Clock Generator. Replace ***cb-slot*** with a value of **0** or **1**.

fpc ***fpc-slot***—(EX Series switches, M120, M320, and M40e routers, MX Series routers, MX2010 routers, MX2020 routers, PTX Series Packet Transport Routers, QFX Series, QFX3500 switches, QFabric systems, T Series routers, and TX Matrix Plus routers) (Optional) Display chassis environmental information for a specified Flexible PIC Concentrator. For MX2010 routers, replace ***fpc-slot*** with a value from **0** through **9**. For MX2020 routers, replace ***fpc-slot*** with a value from **0** through **19**. For information about FPC numbering, see show chassis environment fpc. On a QFabric system, display chassis environmental information for a specified Flexible PIC Concentrator on an Interconnect device. On an EX Series switch, display chassis environmental information for a specified Flexible PIC Concentrator; see *EX Series Switches Hardware and CLI Terminology Mapping* for information on FPC numbering. On a TX Matrix Plus router with 3D SIBs replace *fpc-slot* with a value from **0** through **63**.

fpm—(M120, M320, and M40e routers, MX2010 routers, MX2020 routers, PTX Series, Packet Transport Routers, T Series routers, and TX Matrix Plus routers only) (Optional) Display chassis environmental information for the craft interface (FPM).

interconnect-device ***name***—(QFabric systems only) (Optional) Display chassis environmental information for the Interconnect device.

monitored—(MX2020 routers and PTX Series Packet Transport Routers only) (Optional) Display chassis environmental information for monitored temperatures only. Temperatures that are not included in temperature alarm computations are not displayed.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers and EX Series switches) (Optional) Display chassis environmental information for the local Virtual Chassis member.

member ***member-id***—(MX Series routers and EX Series switches only) (Optional) Display chassis environmental information for the specified member of the Virtual Chassis configuration. On MX Series routers, replace *member-id* variable with a value of **0** or **1**. For EX Series switches, see member for member ID values.

node-device ***name***—(QFabric systems only) (Optional) Display chassis environmental information for the Node device.

pdu ***pdu-slot-number***—(PTX Series only) (Optional) Display chassis environmental information for the specified power distribution unit.

pem—(QFX3500 switches and QFabric systems only) (Optional) Display chassis environmental information for the Power Entry Module on the specified Interconnect device or Node device.

pem ***pem-slot-number***—(ACX Series Universal Access Routers, M120, M320, and M40e routers, MX Series routers, MX104 routers, QFX Series, and T Series routers only) (Optional) Display chassis environmental information for the Power Entry Module on the specified Power Entry Module. For information about the options, see show chassis environment pem.

psm ***psm-slot-number***—(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the power supply module. For MX2020 routers, replace ***psm-slot-number*** with a value from **0** through **17**. For MX2010 routers, replace ***psm-slot-number*** with a value from **0** through **8**.

psu ***psu-slot-number***—(EX Series switches only) (Optional) Display chassis environmental information for a specified power supply. See *EX Series Switches Hardware and CLI Terminology Mapping* for detailed information.

routing-engine—(QFX3500 switches and QFabric systems only) (Optional) Display chassis environmental information for the Routing Engine on the specified Interconnect device.

routing-engine ***re-slot-number***—(Optional) Display chassis environmental information for the specified Routing Engine. For information about the options, see show chassis environment routing-engine.

scg—(T Series routers only) (Optional) Display chassis environmental information about the SONET Clock Generator.

scc—(TX Matrix routers only) (Optional) Display chassis environmental information about the TX Matrix router (switch-card chassis).

sfb ***sfb-slot-number***—(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the power supply module. Replace ***sfb-slot-number*** with a value from **0** through **7**.

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display chassis environmental information about the respective TX Matrix Plus router (switch-fabric chassis). Replace ***number*** variable with **0**.

sib ***sib-slot-number***—(M320 routers, PTX Series Packet Transport Routers, and T Series routers only) (Optional) Display chassis environmental information about the specified switch interface board. For information about the options, see show chassis environment sib.

Required Privilege Level view

Related Documentation

- show chassis environment adc on page 783
- show chassis environment cb on page 794
- show chassis environment ccg on page 812
- *show chassis environment cip*
- show chassis environment fpc on page 814
- show chassis environment fpm on page 840
- *show chassis environment lcc*
- show chassis environment mcs on page 860
- show chassis environment monitored on page 847
- show chassis environment pcg on page 875
- show chassis environment pdu on page 877
- show chassis environment pem on page 880
- show chassis environment psm on page 891
- show chassis environment psu on page 889
- show chassis environment routing-engine on page 896
- show chassis environment scg on page 901
- show chassis environment sfb on page 906
- show chassis environment sib on page 920
- *show chassis environment sfc*

List of Sample Output

Output Fields

Table 46 on page 726 lists the output fields for the **show chassis environment** command. Output fields are listed in the approximate order in which they appear.

Table 46: show chassis environment Output Fields

<table>
<tr><th>Field Name</th><th>Field Description</th></tr>
<tr><td>Class</td><td>Information about the category or class of chassis component:

Power: Power information:

(M5, M10, M20, and M40 routers and EX Series switches only) Power supply status: OK, Testing, (during initial power-on), Failed, or Absent.
(M7i, M10i, M40e, M120, M160, M320, and T Series routers and EX Series switches only) Power Entry Modules status: OK, Testing, (during initial power-on), Check, Failed, or Absent.
(PTX Series only) Power information is reported in PDU or PSM combinations. The status is: OK, Testing, (during initial power-on), Check, Failed, or Absent.

Temp: Temperature of air flowing through the chassis in degrees Celsius (C) and Fahrenheit (F).

On PTX Series Packet Transport Routers and MX2010 and MX2020 Routers, multiple cooling zones are supported. FRU temperatures in each zone are coordinated with the fan speed of fan trays in those zones.
EX2200 switches have a side-to-rear cooling system. The Local Intake temperature is measured by the sensor on the right side of the chassis, and the Remote Intake temperature is measured by the sensor on the left side of the chassis.

Pic: On ACX4000 Routers, multiple temperature channels on a MIC. The status is: OK and the Measurement is in degrees Celsius (C) and Fahrenheit (F).
Fan: Fan status: OK, Testing (during initial power-on), Failed, or Absent.
On PTX Series Packet Transport Routers and MX2010 and MX2020 Routers, multiple fan trays are supported. Fan status is reported in Fan Tray or Fan combinations. Measurement indicates actual fan RPM (PTX and MX2010 and MX2020 Routers only).
Misc: Information about other components of the chassis.

On some routers, this field indicates the status of one or more additional components.
On the M40e, M160, and M320 router, Misc includes CIP (Connector Interface Panel). OK indicates that the CIP is present. Absent indicates that the CIP is not present.
On T Series routers, Misc includes CIP and SPMB (Switch Processor Mezzanine Board). OK indicates that the CIP or SPMB is present. Absent indicates that the CIP or SPMB is not present.
On PTX Series Packet Transport Routers, Misc includes the SPMB (Switch Processor Mezzanine Board). The SPMB is located on the control boards. OK indicates that the control board is present. Absent indicates that the control board is not present.

</td></tr>
<tr><td>Item</td><td>(MX2010 and MX2020 Routers) Information about the chassis component: Routing Engines, Controls Boards (CBs), Switch Fabric Boards (SFBs), PICs, Flexible PIC Concentrators (FPCs), and Adapter Cards (ADCs).

(MX104 Routers) Information about the chassis components: Routing Engines, Control Board (CB), Power Entry Module (PEM), and Compact Forwarding Engine Board (AFEB).

(QFabric Systems) Information about the chassis component: Control Boards, Routing Engines, Flexible PIC Concentrators (FPCs), and Power Entry Modules (PEMs), Node Devices, and Interconnect Devices.

(QFX Series) Information about the chassis component: Flexible PIC Concentrators (FPCs), and Power Entry Modules (PEMs).</td></tr>
</table>

Table 46: show chassis environment Output Fields *(continued)*

Field Name	Field Description
Status	(MX104, MX2010, and MX2020 Routers) Status of the specified chassis component. For example, if the Class is Fan, the fan status can be: • **OK**: The fans are operational. • **Testing**: The fans are being tested during initial power-on. • **Failed**: The fans have failed or the fans are not spinning. • **Absent**: The fan tray is not installed. If the Class is Power, the power supply status can be: • **OK**: The power component is operational. • **Testing**: The power component is being tested during initial power-on. • **Check**: There is insufficient power---that is, fewer than the minimum required feeds are connected. • **Failed**: The inputs leads have failed. • **Absent**: The power component is not installed.
Measurement	(MX104, MX2010, and MX2020 Routers) Dependant on the Class. For example, if the Class is Temp, indicates the temperature in degree Celsius and degrees Fahrenheit. If the Class is Fan, indicates actual fan RPM.

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 (MX104 Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         34 degrees C / 93 degrees F
      PEM 1                          Absent
      ABB 0 Intake                   OK         33 degrees C / 91 degrees F
      ABB 0 Exhaust A                OK         42 degrees C / 107 degrees F
      ABB 0 Exhaust B                OK         43 degrees C / 109 degrees F
      ABB 1 Intake                   Absent
      ABB 1 Exhaust A                Absent
      ABB 1 Exhaust B                Absent
      Routing Engine 0               OK         34 degrees C / 93 degrees F
      Routing Engine 0 CPU           OK         46 degrees C / 114 degrees F
      Routing Engine 1               Absent
      Routing Engine 1 CPU           Absent
      AFEB 0 AFEB Processor          OK         33 degrees C / 91 degrees F
Fans  Fan 1                          OK         Spinning at normal speed
      Fan 2                          OK         Spinning at normal speed
      Fan 3                          OK         Spinning at normal speed
```



```
        Fan 4                         OK         Spinning at normal speed
        Fan 5                         OK         Spinning at normal speed
```

show chassis environment (MX240 Router)

```
user@host> show chassis environment
Class Item                            Status     Measurement
Temp  PEM 0                           OK         40 degrees C / 104 degrees F
      PEM 1                           OK         45 degrees C / 113 degrees F
      PEM 2                           Absent
      PEM 3                           Absent
      Routing Engine 0                OK         39 degrees C / 102 degrees F
      Routing Engine 1                OK         37 degrees C / 98 degrees F
      CB 0 Intake                     OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                  OK         34 degrees C / 93 degrees F
      CB 0 Exhaust B                  OK         38 degrees C / 100 degrees F
      CB 0 ACBC                       OK         37 degrees C / 98 degrees F
      CB 0 SF A                       OK         49 degrees C / 120 degrees F
      CB 0 SF B                       OK         41 degrees C / 105 degrees F
      CB 1 Intake                     OK         37 degrees C / 98 degrees F
      CB 1 Exhaust A                  OK         34 degrees C / 93 degrees F
      CB 1 Exhaust B                  OK         39 degrees C / 102 degrees F
      CB 1 ACBC                       OK         38 degrees C / 100 degrees F
      CB 1 SF A                       OK         47 degrees C / 116 degrees F
      CB 1 SF B                       OK         41 degrees C / 105 degrees F
      FPC 1 Intake                    OK         33 degrees C / 91 degrees F
      FPC 1 Exhaust A                 OK         38 degrees C / 100 degrees F
      FPC 1 Exhaust B                 OK         53 degrees C / 127 degrees F
      FPC 1 I3 0 TSensor              OK         50 degrees C / 122 degrees F
      FPC 1 I3 0 Chip                 OK         53 degrees C / 127 degrees F
      FPC 1 I3 1 TSensor              OK         49 degrees C / 120 degrees F
      FPC 1 I3 1 Chip                 OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor              OK         47 degrees C / 116 degrees F
      FPC 1 I3 2 Chip                 OK         49 degrees C / 120 degrees F
      FPC 1 I3 3 TSensor              OK         44 degrees C / 111 degrees F
      FPC 1 I3 3 Chip                 OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor              OK         45 degrees C / 113 degrees F
      FPC 1 IA 0 Chip                 OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 TSensor              OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 Chip                 OK         48 degrees C / 118 degrees F
      FPC 2 Intake                    OK         32 degrees C / 89 degrees F
      FPC 2 Exhaust A                 OK         40 degrees C / 104 degrees F
      FPC 2 Exhaust B                 OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 TSensor              OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 Chip                 OK         56 degrees C / 132 degrees F
      FPC 2 I3 1 TSensor              OK         52 degrees C / 125 degrees F
      FPC 2 I3 1 Chip                 OK         55 degrees C / 131 degrees F
      FPC 2 I3 2 TSensor              OK         49 degrees C / 120 degrees F
      FPC 2 I3 2 Chip                 OK         52 degrees C / 125 degrees F
      FPC 2 I3 3 TSensor              OK         44 degrees C / 111 degrees F
      FPC 2 I3 3 Chip                 OK         48 degrees C / 118 degrees F
      FPC 2 IA 0 TSensor              OK         50 degrees C / 122 degrees F
      FPC 2 IA 0 Chip                 OK         48 degrees C / 118 degrees F
      FPC 2 IA 1 TSensor              OK         47 degrees C / 116 degrees F
      FPC 2 IA 1 Chip                 OK         53 degrees C / 127 degrees F
Fans  Front Fan                       OK         Spinning at normal speed
      Middle Fan                      OK         Spinning at normal speed
      Rear Fan                        OK         Spinning at normal speed
```


show chassis environment (MX240 Router with SCBE)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         40 degrees C / 104 degrees F
      PEM 1                          OK         45 degrees C / 113 degrees F
      PEM 2                          Absent
      PEM 3                          Absent
      Routing Engine 0               OK         39 degrees C / 102 degrees F
      Routing Engine 1               OK         37 degrees C / 98 degrees F
      CB 0 Intake                    OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                 OK         34 degrees C / 93 degrees F
      CB 0 Exhaust B                 OK         38 degrees C / 100 degrees F
      CB 0 ACBC                      OK         37 degrees C / 98 degrees F
      CB 0 XF A                      OK         49 degrees C / 120 degrees F
      CB 0 XF B                      OK         41 degrees C / 105 degrees F
      CB 1 Intake                    OK         37 degrees C / 98 degrees F
      CB 1 Exhaust A                 OK         34 degrees C / 93 degrees F
      CB 1 Exhaust B                 OK         39 degrees C / 102 degrees F
      CB 1 ACBC                      OK         38 degrees C / 100 degrees F
      CB 1 XF A                      OK         47 degrees C / 116 degrees F
      CB 1 XF B                      OK         41 degrees C / 105 degrees F
      FPC 1 Intake                   OK         33 degrees C / 91 degrees F
      FPC 1 Exhaust A                OK         38 degrees C / 100 degrees F
      FPC 1 Exhaust B                OK         53 degrees C / 127 degrees F
      FPC 1 I3 0 TSensor             OK         50 degrees C / 122 degrees F
      FPC 1 I3 0 Chip                OK         53 degrees C / 127 degrees F
      FPC 1 I3 1 TSensor             OK         49 degrees C / 120 degrees F
      FPC 1 I3 1 Chip                OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor             OK         47 degrees C / 116 degrees F
      FPC 1 I3 2 Chip                OK         49 degrees C / 120 degrees F
      FPC 1 I3 3 TSensor             OK         44 degrees C / 111 degrees F
      FPC 1 I3 3 Chip                OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor             OK         45 degrees C / 113 degrees F
      FPC 1 IA 0 Chip                OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 TSensor             OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 Intake                   OK         32 degrees C / 89 degrees F
      FPC 2 Exhaust A                OK         40 degrees C / 104 degrees F
      FPC 2 Exhaust B                OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 TSensor             OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 Chip                OK         56 degrees C / 132 degrees F
      FPC 2 I3 1 TSensor             OK         52 degrees C / 125 degrees F
      FPC 2 I3 1 Chip                OK         55 degrees C / 131 degrees F
      FPC 2 I3 2 TSensor             OK         49 degrees C / 120 degrees F
      FPC 2 I3 2 Chip                OK         52 degrees C / 125 degrees F
      FPC 2 I3 3 TSensor             OK         44 degrees C / 111 degrees F
      FPC 2 I3 3 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 IA 0 TSensor             OK         50 degrees C / 122 degrees F
      FPC 2 IA 0 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 IA 1 TSensor             OK         47 degrees C / 116 degrees F
      FPC 2 IA 1 Chip                OK         53 degrees C / 127 degrees F
Fans  Front Fan                      OK         Spinning at normal speed
      Middle Fan                     OK         Spinning at normal speed
      Rear Fan                       OK         Spinning at normal speed
```

show chassis environment (MX480 Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         35 degrees C / 95 degrees F
```



```
      PEM 1                       OK         40 degrees C / 104 degrees F
      PEM 2                       Absent
      PEM 3                       Absent
      Routing Engine 0            OK         44 degrees C / 111 degrees F
      Routing Engine 1            OK         45 degrees C / 113 degrees F
      CB 0 Intake                 OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A              OK         38 degrees C / 100 degrees F
      CB 0 Exhaust B              OK         39 degrees C / 102 degrees F
      CB 0 ACBC                   OK         37 degrees C / 98 degrees F
      CB 0 SF A                   OK         51 degrees C / 123 degrees F
      CB 0 SF B                   OK         44 degrees C / 111 degrees F
      CB 1 Intake                 OK         36 degrees C / 96 degrees F
      CB 1 Exhaust A              OK         39 degrees C / 102 degrees F
      CB 1 Exhaust B              OK         40 degrees C / 104 degrees F
      CB 1 ACBC                   OK         37 degrees C / 98 degrees F
      CB 1 SF A                   OK         50 degrees C / 122 degrees F
      CB 1 SF B                   OK         43 degrees C / 109 degrees F
      FPC 0 Intake                OK         36 degrees C / 96 degrees F
      FPC 0 Exhaust A             OK         39 degrees C / 102 degrees F
      FPC 0 Exhaust B             OK         51 degrees C / 123 degrees F
      FPC 0 I3 0 TSensor          OK         49 degrees C / 120 degrees F
      FPC 0 I3 0 Chip             OK         56 degrees C / 132 degrees F
      FPC 0 I3 1 TSensor          OK         47 degrees C / 116 degrees F
      FPC 0 I3 1 Chip             OK         52 degrees C / 125 degrees F
      FPC 0 I3 2 TSensor          OK         46 degrees C / 114 degrees F
      FPC 0 I3 2 Chip             OK         48 degrees C / 118 degrees F
      FPC 0 I3 3 TSensor          OK         42 degrees C / 107 degrees F
      FPC 0 I3 3 Chip             OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 TSensor          OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 Chip             OK         45 degrees C / 113 degrees F
      FPC 0 IA 1 TSensor          OK         44 degrees C / 111 degrees F
      FPC 0 IA 1 Chip             OK         48 degrees C / 118 degrees F
      FPC 1 Intake                OK         37 degrees C / 98 degrees F
      FPC 1 Exhaust A             OK         41 degrees C / 105 degrees F
      FPC 1 Exhaust B             OK         52 degrees C / 125 degrees F
      FPC 1 I3 0 TSensor          OK         51 degrees C / 123 degrees F
      FPC 1 I3 0 Chip             OK         57 degrees C / 134 degrees F
      FPC 1 I3 1 TSensor          OK         48 degrees C / 118 degrees F
      FPC 1 I3 1 Chip             OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor          OK         46 degrees C / 114 degrees F
      FPC 1 I3 2 Chip             OK         50 degrees C / 122 degrees F
      FPC 1 I3 3 TSensor          OK         42 degrees C / 107 degrees F
      FPC 1 I3 3 Chip             OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor          OK         49 degrees C / 120 degrees F
      FPC 1 IA 0 Chip             OK         48 degrees C / 118 degrees F
      FPC 1 IA 1 TSensor          OK         46 degrees C / 114 degrees F
      FPC 1 IA 1 Chip             OK         50 degrees C / 122 degrees F
Fans  Top Rear Fan                OK         Spinning at normal speed
      Bottom Rear Fan             OK         Spinning at normal speed
      Top Middle Fan              OK         Spinning at normal speed
      Bottom Middle Fan           OK         Spinning at normal speed
      Top Front Fan               OK         Spinning at normal speed
      Bottom Front Fan            OK         Spinning at normal speed
```

show chassis environment (MX480 Router with SCBE)

```
user@host> show chassis environment
Class Item                        Status     Measurement
Temp  PEM 0                       OK         35 degrees C / 95 degrees F
      PEM 1                       OK         40 degrees C / 104 degrees F
      PEM 2                       Absent
```

```
            PEM 3                           Absent
            Routing Engine 0                OK          44 degrees C / 111 degrees F
            Routing Engine 1                OK          45 degrees C / 113 degrees F
            CB 0 Intake                     OK          36 degrees C / 96 degrees F
            CB 0 Exhaust A                  OK          38 degrees C / 100 degrees F
            CB 0 Exhaust B                  OK          39 degrees C / 102 degrees F
            CB 0 ACBC                       OK          37 degrees C / 98 degrees F
            CB 0 XF A                       OK          51 degrees C / 123 degrees F
            CB 0 XF B                       OK          44 degrees C / 111 degrees F
            CB 1 Intake                     OK          36 degrees C / 96 degrees F
            CB 1 Exhaust A                  OK          39 degrees C / 102 degrees F
            CB 1 Exhaust B                  OK          40 degrees C / 104 degrees F
            CB 1 ACBC                       OK          37 degrees C / 98 degrees F
            CB 1 XF A                       OK          50 degrees C / 122 degrees F
            CB 1 XF B                       OK          43 degrees C / 109 degrees F
            FPC 0 Intake                    OK          36 degrees C / 96 degrees F
            FPC 0 Exhaust A                 OK          39 degrees C / 102 degrees F
            FPC 0 Exhaust B                 OK          51 degrees C / 123 degrees F
            FPC 0 I3 0 TSensor              OK          49 degrees C / 120 degrees F
            FPC 0 I3 0 Chip                 OK          56 degrees C / 132 degrees F
            FPC 0 I3 1 TSensor              OK          47 degrees C / 116 degrees F
            FPC 0 I3 1 Chip                 OK          52 degrees C / 125 degrees F
            FPC 0 I3 2 TSensor              OK          46 degrees C / 114 degrees F
            FPC 0 I3 2 Chip                 OK          48 degrees C / 118 degrees F
            FPC 0 I3 3 TSensor              OK          42 degrees C / 107 degrees F
            FPC 0 I3 3 Chip                 OK          45 degrees C / 113 degrees F
            FPC 0 IA 0 TSensor              OK          45 degrees C / 113 degrees F
            FPC 0 IA 0 Chip                 OK          45 degrees C / 113 degrees F
            FPC 0 IA 1 TSensor              OK          44 degrees C / 111 degrees F
            FPC 0 IA 1 Chip                 OK          48 degrees C / 118 degrees F
            FPC 1 Intake                    OK          37 degrees C / 98 degrees F
            FPC 1 Exhaust A                 OK          41 degrees C / 105 degrees F
            FPC 1 Exhaust B                 OK          52 degrees C / 125 degrees F
            FPC 1 I3 0 TSensor              OK          51 degrees C / 123 degrees F
            FPC 1 I3 0 Chip                 OK          57 degrees C / 134 degrees F
            FPC 1 I3 1 TSensor              OK          48 degrees C / 118 degrees F
            FPC 1 I3 1 Chip                 OK          52 degrees C / 125 degrees F
            FPC 1 I3 2 TSensor              OK          46 degrees C / 114 degrees F
            FPC 1 I3 2 Chip                 OK          50 degrees C / 122 degrees F
            FPC 1 I3 3 TSensor              OK          42 degrees C / 107 degrees F
            FPC 1 I3 3 Chip                 OK          46 degrees C / 114 degrees F
            FPC 1 IA 0 TSensor              OK          49 degrees C / 120 degrees F
            FPC 1 IA 0 Chip                 OK          48 degrees C / 118 degrees F
            FPC 1 IA 1 TSensor              OK          46 degrees C / 114 degrees F
            FPC 1 IA 1 Chip                 OK          50 degrees C / 122 degrees F
      Fans  Top Rear Fan                    OK          Spinning at normal speed
            Bottom Rear Fan                 OK          Spinning at normal speed
            Top Middle Fan                  OK          Spinning at normal speed
            Bottom Middle Fan               OK          Spinning at normal speed
            Top Front Fan                   OK          Spinning at normal speed
            Bottom Front Fan                OK          Spinning at normal speed
```

show chassis environment (MX960 Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          Absent
      PEM 1                          Absent
      PEM 2                          Check
      PEM 3                          OK         35 degrees C / 95 degrees F
      Routing Engine 0               OK         37 degrees C / 98 degrees F
```



```
        Routing Engine 1              Absent
        CB 0 Intake                   OK         24 degrees C / 75 degrees F
        CB 0 Exhaust A                OK         30 degrees C / 86 degrees F
        CB 0 Exhaust B                OK         27 degrees C / 80 degrees F
        CB 1 Intake                   Absent
        CB 1 Exhaust A                Absent
        CB 1 Exhaust B                Absent
        CB 1 ACBC                     Absent
        CB 1 SF A                     Absent
        CB 1 SF B                     Absent
        CB 2 Intake                   Absent
        CB 2 Exhaust A                Absent
        CB 2 Exhaust B                Absent
        CB 2 ACBC                     Absent
        CB 2 SF A                     Absent
        CB 2 SF B                     Absent
        FPC 4 Intake                  OK         24 degrees C / 75 degrees F
        FPC 4 Exhaust A               OK         36 degrees C / 96 degrees F
        FPC 4 Exhaust B               OK         38 degrees C / 100 degrees F
        FPC 7 Intake                  OK         24 degrees C / 75 degrees F
        FPC 7 Exhaust A               OK         36 degrees C / 96 degrees F
        FPC 7 Exhaust B               OK         42 degrees C / 107 degrees F
Fans    Top Fan Tray Temp             Failed
        Top Tray Fan 1                OK         Spinning at normal speed
        Top Tray Fan 2                OK         Spinning at normal speed
        Top Tray Fan 3                OK         Spinning at normal speed
        Top Tray Fan 4                OK         Spinning at normal speed
        Top Tray Fan 5                OK         Spinning at normal speed
        Top Tray Fan 6                OK         Spinning at normal speed
        Bottom Fan Tray Temp          Failed
        Bottom Tray Fan 1             OK         Spinning at normal speed
        Bottom Tray Fan 2             OK         Spinning at normal speed
        Bottom Tray Fan 3             OK         Spinning at normal speed
        Bottom Tray Fan 4             OK         Spinning at normal speed
        Bottom Tray Fan 5             OK         Spinning at normal speed
        Bottom Tray Fan 6             OK         Spinning at normal speed
```

show chassis environment (MX960 Router with SCBE)

```
user@host> show chassis environment
Class Item                            Status     Measurement
Temp    PEM 0                         Absent
        PEM 1                         OK         50 degrees C / 122 degrees F
        PEM 2                         OK         50 degrees C / 122 degrees F
        PEM 3                         OK         50 degrees C / 122 degrees F
        Routing Engine 0              OK         42 degrees C / 107 degrees F
        Routing Engine 0 CPU          OK         51 degrees C / 123 degrees F
        Routing Engine 1              OK         39 degrees C / 102 degrees F
        Routing Engine 1 CPU          OK         44 degrees C / 111 degrees F
        CB 0 Intake                   OK         35 degrees C / 95 degrees F
        CB 0 Exhaust A                OK         36 degrees C / 96 degrees F
        CB 0 Exhaust B                OK         43 degrees C / 109 degrees F
        CB 0 ACBC                     OK         38 degrees C / 100 degrees F
        CB 0 XF A                     OK         53 degrees C / 127 degrees F
        CB 0 XF B                     OK         47 degrees C / 116 degrees F
        CB 1 Intake                   OK         35 degrees C / 95 degrees F
        CB 1 Exhaust A                OK         35 degrees C / 95 degrees F
        CB 1 Exhaust B                OK         41 degrees C / 105 degrees F
        CB 1 ACBC                     OK         38 degrees C / 100 degrees F
        CB 1 XF A                     OK         52 degrees C / 125 degrees F
        CB 1 XF B                     OK         47 degrees C / 116 degrees F
```

```
CB 2 Intake                  OK          32 degrees C / 89 degrees F
CB 2 Exhaust A               OK          30 degrees C / 86 degrees F
CB 2 Exhaust B               OK          35 degrees C / 95 degrees F
CB 2 ACBC                    OK          33 degrees C / 91 degrees F
CB 2 XF A                    OK          51 degrees C / 123 degrees F
CB 2 XF B                    OK          50 degrees C / 122 degrees F
FPC 0 Intake                 OK          35 degrees C / 95 degrees F
FPC 0 Exhaust A              OK          39 degrees C / 102 degrees F
FPC 0 Exhaust B              OK          50 degrees C / 122 degrees F
FPC 0 I3 0 TSensor           OK          50 degrees C / 122 degrees F
FPC 0 I3 0 Chip              OK          56 degrees C / 132 degrees F
FPC 0 I3 1 TSensor           OK          47 degrees C / 116 degrees F
FPC 0 I3 1 Chip              OK          50 degrees C / 122 degrees F
FPC 0 I3 2 TSensor           OK          45 degrees C / 113 degrees F
FPC 0 I3 2 Chip              OK          48 degrees C / 118 degrees F
FPC 0 I3 3 TSensor           OK          41 degrees C / 105 degrees F
FPC 0 I3 3 Chip              OK          44 degrees C / 111 degrees F
FPC 0 IA 0 TSensor           OK          45 degrees C / 113 degrees F
FPC 0 IA 0 Chip              OK          45 degrees C / 113 degrees F
FPC 0 IA 1 TSensor           OK          44 degrees C / 111 degrees F
FPC 0 IA 1 Chip              OK          48 degrees C / 118 degrees F
FPC 1 Intake                 OK          36 degrees C / 96 degrees F
FPC 1 Exhaust A              OK          47 degrees C / 116 degrees F
FPC 1 Exhaust B              OK          43 degrees C / 109 degrees F
FPC 1 LU 0 TCAM TSensor      OK          53 degrees C / 127 degrees F
FPC 1 LU 0 TCAM Chip         OK          57 degrees C / 134 degrees F
FPC 1 LU 0 TSensor           OK          53 degrees C / 127 degrees F
FPC 1 LU 0 Chip              OK          60 degrees C / 140 degrees F
FPC 1 MQ 0 TSensor           OK          53 degrees C / 127 degrees F
FPC 1 MQ 0 Chip              OK          56 degrees C / 132 degrees F
FPC 1 LU 1 TCAM TSensor      OK          51 degrees C / 123 degrees F
FPC 1 LU 1 TCAM Chip         OK          52 degrees C / 125 degrees F
FPC 1 LU 1 TSensor           OK          51 degrees C / 123 degrees F
FPC 1 LU 1 Chip              OK          53 degrees C / 127 degrees F
FPC 1 MQ 1 TSensor           OK          51 degrees C / 123 degrees F
FPC 1 MQ 1 Chip              OK          58 degrees C / 136 degrees F
FPC 2 Intake                 OK          35 degrees C / 95 degrees F
FPC 2 Exhaust A              OK          39 degrees C / 102 degrees F
FPC 2 Exhaust B              OK          54 degrees C / 129 degrees F
FPC 2 I3 0 TSensor           OK          52 degrees C / 125 degrees F
FPC 2 I3 0 Chip              OK          59 degrees C / 138 degrees F
FPC 2 I3 1 TSensor           OK          48 degrees C / 118 degrees F
FPC 2 I3 1 Chip              OK          52 degrees C / 125 degrees F
FPC 2 I3 2 TSensor           OK          47 degrees C / 116 degrees F
FPC 2 I3 2 Chip              OK          49 degrees C / 120 degrees F
FPC 2 I3 3 TSensor           OK          41 degrees C / 105 degrees F
FPC 2 I3 3 Chip              OK          44 degrees C / 111 degrees F
FPC 2 IA 0 TSensor           OK          47 degrees C / 116 degrees F
FPC 2 IA 0 Chip              OK          46 degrees C / 114 degrees F
FPC 2 IA 1 TSensor           OK          45 degrees C / 113 degrees F
FPC 2 IA 1 Chip              OK          49 degrees C / 120 degrees F
FPC 3 Intake                 OK          34 degrees C / 93 degrees F
FPC 3 Exhaust A              OK          34 degrees C / 93 degrees F
FPC 3 Exhaust B              OK          47 degrees C / 116 degrees F
FPC 3 I3 0 TSensor           OK          48 degrees C / 118 degrees F
FPC 3 I3 0 Chip              OK          52 degrees C / 125 degrees F
FPC 3 I3 1 TSensor           OK          46 degrees C / 114 degrees F
FPC 3 I3 1 Chip              OK          48 degrees C / 118 degrees F
FPC 3 IA 0 TSensor           OK          41 degrees C / 105 degrees F
FPC 3 IA 0 Chip              OK          40 degrees C / 104 degrees F
FPC 5 Intake                 OK          42 degrees C / 107 degrees F
```



```
            FPC 5 Exhaust A              OK          42 degrees C / 107 degrees F
            FPC 5 Exhaust B              OK          53 degrees C / 127 degrees F
            FPC 5 LU 0 TSensor           OK          53 degrees C / 127 degrees F
            FPC 5 LU 0 Chip              OK          54 degrees C / 129 degrees F
            FPC 5 LU 1 TSensor           OK          53 degrees C / 127 degrees F
            FPC 5 LU 1 Chip              OK          61 degrees C / 141 degrees F
            FPC 5 LU 2 TSensor           OK          53 degrees C / 127 degrees F
            FPC 5 LU 2 Chip              OK          51 degrees C / 123 degrees F
            FPC 5 LU 3 TSensor           OK          53 degrees C / 127 degrees F
            FPC 5 LU 3 Chip              OK          53 degrees C / 127 degrees F
            FPC 5 MQ 0 TSensor           OK          47 degrees C / 116 degrees F
            FPC 5 MQ 0 Chip              OK          52 degrees C / 125 degrees F
            FPC 5 MQ 1 TSensor           OK          47 degrees C / 116 degrees F
            FPC 5 MQ 1 Chip              OK          52 degrees C / 125 degrees F
            FPC 5 MQ 2 TSensor           OK          47 degrees C / 116 degrees F
            FPC 5 MQ 2 Chip              OK          46 degrees C / 114 degrees F
            FPC 5 MQ 3 TSensor           OK          47 degrees C / 116 degrees F
            FPC 5 MQ 3 Chip              OK          45 degrees C / 113 degrees F
            FPC 7 Intake                 OK          36 degrees C / 96 degrees F
            FPC 7 Exhaust A              OK          35 degrees C / 95 degrees F
            FPC 7 Exhaust B              OK          33 degrees C / 91 degrees F
            FPC 7 QX 0 TSensor           OK          42 degrees C / 107 degrees F
            FPC 7 QX 0 Chip              OK          47 degrees C / 116 degrees F
            FPC 7 LU 0 TCAM TSensor      OK          42 degrees C / 107 degrees F
            FPC 7 LU 0 TCAM Chip         OK          44 degrees C / 111 degrees F
            FPC 7 LU 0 TSensor           OK          42 degrees C / 107 degrees F
            FPC 7 LU 0 Chip              OK          46 degrees C / 114 degrees F
            FPC 7 MQ 0 TSensor           OK          42 degrees C / 107 degrees F
            FPC 7 MQ 0 Chip              OK          45 degrees C / 113 degrees F
            FPC 8 Intake                 OK          33 degrees C / 91 degrees F
            FPC 8 Exhaust A              OK          33 degrees C / 91 degrees F
            FPC 8 Exhaust B              OK          36 degrees C / 96 degrees F
            FPC 8 I3 0 TSensor           OK          38 degrees C / 100 degrees F
            FPC 8 I3 0 Chip              OK          43 degrees C / 109 degrees F
            FPC 8 BDS 0 TSensor          OK          37 degrees C / 98 degrees F
            FPC 8 BDS 0 Chip             OK          36 degrees C / 96 degrees F
            FPC 8 IA 0 TSensor           OK          37 degrees C / 98 degrees F
            FPC 8 IA 0 Chip              OK          37 degrees C / 98 degrees F
            FPC 10 Intake                OK          38 degrees C / 100 degrees F
            FPC 10 Exhaust A             OK          36 degrees C / 96 degrees F
            FPC 10 Exhaust B             OK          41 degrees C / 105 degrees F
            FPC 10 I3 0 TSensor          OK          40 degrees C / 104 degrees F
            FPC 10 I3 0 Chip             OK          42 degrees C / 107 degrees F
            FPC 10 I3 1 TSensor          OK          40 degrees C / 104 degrees F
            FPC 10 I3 1 Chip             OK          44 degrees C / 111 degrees F
            FPC 10 I3 2 TSensor          OK          42 degrees C / 107 degrees F
            FPC 10 I3 2 Chip             OK          43 degrees C / 109 degrees F
            FPC 10 I3 3 TSensor          OK          39 degrees C / 102 degrees F
            FPC 10 I3 3 Chip             OK          44 degrees C / 111 degrees F
            FPC 10 IA 0 TSensor          OK          36 degrees C / 96 degrees F
            FPC 10 IA 0 Chip             OK          36 degrees C / 96 degrees F
            FPC 10 IA 1 TSensor          OK          43 degrees C / 109 degrees F
            FPC 10 IA 1 Chip             OK          42 degrees C / 107 degrees F
      Fans  Top Fan Tray Temp            OK          37 degrees C / 98 degrees F
            Top Tray Fan 1               OK          Spinning at normal speed
            Top Tray Fan 2               OK          Spinning at normal speed
            Top Tray Fan 3               OK          Spinning at normal speed
            Top Tray Fan 4               OK          Spinning at normal speed
            Top Tray Fan 5               OK          Spinning at normal speed
            Top Tray Fan 6               OK          Spinning at normal speed
            Bottom Fan Tray Temp         OK          28 degrees C / 82 degrees F
```

```
Bottom Tray Fan 1              OK          Spinning at normal speed
Bottom Tray Fan 2              OK          Spinning at normal speed
Bottom Tray Fan 3              OK          Spinning at normal speed
Bottom Tray Fan 4              OK          Spinning at normal speed
Bottom Tray Fan 5              OK          Spinning at normal speed
Bottom Tray Fan 6              OK          Spinning at normal speed
```

show chassis environment (MX960 Router with MPC5EQ)

```
user@host> show chassis environment
Class Item                           Status      Measurement
Temp  PEM 0                          OK          50 degrees C / 122 degrees F
      PEM 1                          OK          45 degrees C / 113 degrees F
      PEM 2                          OK          45 degrees C / 113 degrees F
      PEM 3                          Absent
      Routing Engine 0               OK          31 degrees C / 87 degrees F
      Routing Engine 0 CPU           OK          30 degrees C / 86 degrees F
      Routing Engine 1               Present
      Routing Engine 1 CPU           Present
      CB 0 Intake                    OK          29 degrees C / 84 degrees F
      CB 0 Exhaust A                 OK          29 degrees C / 84 degrees F
      CB 0 Exhaust B                 OK          34 degrees C / 93 degrees F
      CB 0 ACBC                      OK          32 degrees C / 89 degrees F
      CB 0 XF A                      OK          49 degrees C / 120 degrees F
      CB 0 XF B                      OK          45 degrees C / 113 degrees F
      CB 1 Intake                    OK          26 degrees C / 78 degrees F
      CB 1 Exhaust A                 OK          26 degrees C / 78 degrees F
      CB 1 Exhaust B                 OK          27 degrees C / 80 degrees F
      CB 1 ACBC                      OK          26 degrees C / 78 degrees F
      CB 1 XF A                      OK          32 degrees C / 89 degrees F
      CB 1 XF B                      OK          32 degrees C / 89 degrees F
      CB 2 Intake                    OK          28 degrees C / 82 degrees F
      CB 2 Exhaust A                 OK          27 degrees C / 80 degrees F
      CB 2 Exhaust B                 OK          33 degrees C / 91 degrees F
      CB 2 ACBC                      OK          30 degrees C / 86 degrees F
      CB 2 XF A                      OK          48 degrees C / 118 degrees F
      CB 2 XF B                      OK          46 degrees C / 114 degrees F
      FPC 0 Intake                   OK          38 degrees C / 100 degrees F
      FPC 0 Exhaust A                OK          48 degrees C / 118 degrees F
      FPC 0 Exhaust B                OK          49 degrees C / 120 degrees F
      FPC 0 XL TSen                  OK          48 degrees C / 118 degrees F
      FPC 0 XL Chip                  OK          50 degrees C / 122 degrees F
      FPC 0 XL_XR0 TSen              OK          48 degrees C / 118 degrees F
      FPC 0 XL_XR0 Chip              OK          53 degrees C / 127 degrees F
      FPC 0 XL_XR1 TSen              OK          48 degrees C / 118 degrees F
      FPC 0 XL_XR1 Chip              OK          54 degrees C / 129 degrees F
      FPC 0 XQ TSen                  OK          48 degrees C / 118 degrees F
      FPC 0 XQ Chip                  OK          52 degrees C / 125 degrees F
      FPC 0 XQ_XR0 TSen              OK          48 degrees C / 118 degrees F
      FPC 0 XQ_XR0 Chip              OK          62 degrees C / 143 degrees F
      FPC 0 XQ_XR1 TSen              OK          48 degrees C / 118 degrees F
      FPC 0 XQ_XR1 Chip              OK          62 degrees C / 143 degrees F
      FPC 0 XM 0 TSen                OK          53 degrees C / 127 degrees F
      FPC 0 XM 0 Chip                OK          63 degrees C / 145 degrees F
      FPC 0 XM 1 TSen                OK          53 degrees C / 127 degrees F
      FPC 0 XM 1 Chip                OK          46 degrees C / 114 degrees F
      FPC 0 PLX PCIe Switch TSe      OK          53 degrees C / 127 degrees F
      FPC 0 PLX PCIe Switch Chi      OK          66 degrees C / 150 degrees F
      FPC 1 Intake                   OK          31 degrees C / 87 degrees F
      FPC 1 Exhaust A                OK          38 degrees C / 100 degrees F
      FPC 1 Exhaust B                OK          49 degrees C / 120 degrees F
```

```
     FPC 1 LU 0 TSen                OK          41 degrees C / 105 degrees F
     FPC 1 LU 0 Chip                OK          47 degrees C / 116 degrees F
     FPC 1 LU 1 TSen                OK          41 degrees C / 105 degrees F
FPC 1 LU 1 Chip                OK          42 degrees C / 107 degrees F
     FPC 1 LU 2 TSen                OK          41 degrees C / 105 degrees F
     FPC 1 LU 2 Chip                OK          46 degrees C / 114 degrees F
     FPC 1 LU 3 TSen                OK          41 degrees C / 105 degrees F
     FPC 1 LU 3 Chip                OK          51 degrees C / 123 degrees F
     FPC 1 XM 0 TSen                OK          41 degrees C / 105 degrees F
     FPC 1 XM 0 Chip                OK          49 degrees C / 120 degrees F
     FPC 1 XF 0 TSen                OK          41 degrees C / 105 degrees F
     FPC 1 XF 0 Chip                OK          63 degrees C / 145 degrees F
     FPC 1 PLX Switch TSen          OK          41 degrees C / 105 degrees F
     FPC 1 PLX Switch Chip          OK          43 degrees C / 109 degrees F
     FPC 3 Intake                   OK          31 degrees C / 87 degrees F
     FPC 3 Exhaust A                OK          37 degrees C / 98 degrees F
     FPC 3 Exhaust B                OK          43 degrees C / 109 degrees F
     FPC 3 LU 0 TSen                OK          42 degrees C / 107 degrees F
     FPC 3 LU 0 Chip                OK          43 degrees C / 109 degrees F
     FPC 3 LU 1 TSen                OK          42 degrees C / 107 degrees F
     FPC 3 LU 1 Chip                OK          46 degrees C / 114 degrees F
     FPC 3 LU 2 TSen                OK          42 degrees C / 107 degrees F
     FPC 3 LU 2 Chip                OK          40 degrees C / 104 degrees F
     FPC 3 LU 3 TSen                OK          42 degrees C / 107 degrees F
     FPC 3 LU 3 Chip                OK          41 degrees C / 105 degrees F
     FPC 3 MQ 0 TSen                OK          37 degrees C / 98 degrees F
     FPC 3 MQ 0 Chip                OK          37 degrees C / 98 degrees F
     FPC 3 MQ 1 TSen                OK          37 degrees C / 98 degrees F
     FPC 3 MQ 1 Chip                OK          40 degrees C / 104 degrees F
     FPC 3 MQ 2 TSen                OK          37 degrees C / 98 degrees F
     FPC 3 MQ 2 Chip                OK          36 degrees C / 96 degrees F
     FPC 3 MQ 3 TSen                OK          37 degrees C / 98 degrees F
     FPC 3 MQ 3 Chip                OK          38 degrees C / 100 degrees F
     FPC 4 Intake                   OK          34 degrees C / 93 degrees F
     FPC 4 Exhaust A                OK          45 degrees C / 113 degrees F
     FPC 4 Exhaust B                OK          47 degrees C / 116 degrees F
     FPC 4 XL TSen                  OK          44 degrees C / 111 degrees F
     FPC 4 XL Chip                  OK          47 degrees C / 116 degrees F
     FPC 4 XL_XR0 TSen              OK          44 degrees C / 111 degrees F
     FPC 4 XL_XR0 Chip              OK          48 degrees C / 118 degrees F
     FPC 4 XL_XR1 TSen              OK          44 degrees C / 111 degrees F
     FPC 4 XL_XR1 Chip              OK          47 degrees C / 116 degrees F
     FPC 4 XQ TSen                  OK          44 degrees C / 111 degrees F
     FPC 4 XQ Chip                  OK          47 degrees C / 116 degrees F
     FPC 4 XQ_XR0 TSen              OK          44 degrees C / 111 degrees F
     FPC 4 XQ_XR0 Chip              OK          57 degrees C / 134 degrees F
     FPC 4 XQ_XR1 TSen              OK          44 degrees C / 111 degrees F
     FPC 4 XQ_XR1 Chip              OK          58 degrees C / 136 degrees F
     FPC 4 XM 0 TSen                OK          51 degrees C / 123 degrees F
     FPC 4 XM 0 Chip                OK          61 degrees C / 141 degrees F
     FPC 4 XM 1 TSen                OK          51 degrees C / 123 degrees F
     FPC 4 XM 1 Chip                OK          47 degrees C / 116 degrees F
     FPC 4 PLX PCIe Switch TSe      OK          51 degrees C / 123 degrees F
     FPC 4 PLX PCIe Switch Chi      OK          60 degrees C / 140 degrees F
     FPC 5 Intake                   OK          34 degrees C / 93 degrees F
     FPC 5 Exhaust A                OK          45 degrees C / 113 degrees F
     FPC 5 Exhaust B                OK          47 degrees C / 116 degrees F
     FPC 5 XL TSen                  OK          45 degrees C / 113 degrees F
     FPC 5 XL Chip                  OK          47 degrees C / 116 degrees F
     FPC 5 XL_XR0 TSen              OK          45 degrees C / 113 degrees F
FPC 5 XL_XR0 Chip              OK          49 degrees C / 120 degrees F
```

```
    FPC 5 XL_XR1 TSen          OK          45 degrees C / 113 degrees F
    FPC 5 XL_XR1 Chip          OK          49 degrees C / 120 degrees F
    FPC 5 XQ TSen              OK          45 degrees C / 113 degrees F
    FPC 5 XQ Chip              OK          48 degrees C / 118 degrees F
    FPC 5 XQ_XR0 TSen          OK          45 degrees C / 113 degrees F
    FPC 5 XQ_XR0 Chip          OK          60 degrees C / 140 degrees F
    FPC 5 XQ_XR1 TSen          OK          45 degrees C / 113 degrees F
    FPC 5 XQ_XR1 Chip          OK          58 degrees C / 136 degrees F
    FPC 5 XM 0 TSen            OK          50 degrees C / 122 degrees F
    FPC 5 XM 0 Chip            OK          48 degrees C / 118 degrees F
    FPC 5 XM 1 TSen            OK          50 degrees C / 122 degrees F
    FPC 5 XM 1 Chip            OK          47 degrees C / 116 degrees F
    FPC 5 PLX PCIe Switch TSe  OK          50 degrees C / 122 degrees F
    FPC 5 PLX PCIe Switch Chi  OK          59 degrees C / 138 degrees F
    FPC 7 Intake               OK          32 degrees C / 89 degrees F
    FPC 7 Exhaust A            OK          32 degrees C / 89 degrees F
    FPC 7 Exhaust B            OK          33 degrees C / 91 degrees F
    FPC 7 LU 0 TSen            OK          49 degrees C / 120 degrees F
    FPC 7 LU 0 Chip            OK          44 degrees C / 111 degrees F
    FPC 7 LU 1 TSen            OK          49 degrees C / 120 degrees F
    FPC 7 LU 1 Chip            OK          47 degrees C / 116 degrees F
    FPC 7 LU 2 TSen            OK          49 degrees C / 120 degrees F
    FPC 7 LU 2 Chip            OK          39 degrees C / 102 degrees F
    FPC 7 LU 3 TSen            OK          49 degrees C / 120 degrees F
    FPC 7 LU 3 Chip            OK          43 degrees C / 109 degrees F
    FPC 7 XM 0 TSen            OK          49 degrees C / 120 degrees F
    FPC 7 XM 0 Chip            OK          57 degrees C / 134 degrees F
    FPC 7 XM 1 TSen            OK          49 degrees C / 120 degrees F
    FPC 7 XM 1 Chip            OK          48 degrees C / 118 degrees F
    FPC 7 PLX Switch TSen      OK          49 degrees C / 120 degrees F
    FPC 7 PLX Switch Chip      OK          45 degrees C / 113 degrees F
    FPC 8 Intake               OK          36 degrees C / 96 degrees F
    FPC 8 Exhaust A            OK          51 degrees C / 123 degrees F
    FPC 8 Exhaust B            OK          46 degrees C / 114 degrees F
    FPC 8 XL TSen              OK          46 degrees C / 114 degrees F
    FPC 8 XL Chip              OK          47 degrees C / 116 degrees F
    FPC 8 XL_XR0 TSen          OK          46 degrees C / 114 degrees F
    FPC 8 XL_XR0 Chip          OK          53 degrees C / 127 degrees F
    FPC 8 XL_XR1 TSen          OK          46 degrees C / 114 degrees F
    FPC 8 XL_XR1 Chip          OK          52 degrees C / 125 degrees F
    FPC 8 XQ TSen              OK          46 degrees C / 114 degrees F
    FPC 8 XQ Chip              OK          46 degrees C / 114 degrees F
    FPC 8 XQ_XR0 TSen          OK          46 degrees C / 114 degrees F
    FPC 8 XQ_XR0 Chip          OK          59 degrees C / 138 degrees F
    FPC 8 XQ_XR1 TSen          OK          46 degrees C / 114 degrees F
    FPC 8 XQ_XR1 Chip          OK          57 degrees C / 134 degrees F
    FPC 8 XM 0 TSen            OK          52 degrees C / 125 degrees F
    FPC 8 XM 0 Chip            OK          61 degrees C / 141 degrees F
    FPC 8 XM 1 TSen            OK          52 degrees C / 125 degrees F
    FPC 8 XM 1 Chip            OK          47 degrees C / 116 degrees F
    FPC 8 PLX PCIe Switch TSe  OK          52 degrees C / 125 degrees F
    FPC 8 PLX PCIe Switch Chi  OK          63 degrees C / 145 degrees F
    FPC 9 Intake               OK          31 degrees C / 87 degrees F
    FPC 9 Exhaust A            OK          34 degrees C / 93 degrees F
    FPC 9 Exhaust B            OK          35 degrees C / 95 degrees F
FPC 9 QX 0 TSen                OK          42 degrees C / 107 degrees F
    FPC 9 QX 0 Chip            OK          45 degrees C / 113 degrees F
    FPC 9 LU 0 TCAM TSen       OK          42 degrees C / 107 degrees F
    FPC 9 LU 0 TCAM Chip       OK          41 degrees C / 105 degrees F
    FPC 9 LU 0 TSen            OK          42 degrees C / 107 degrees F
    FPC 9 LU 0 Chip            OK          43 degrees C / 109 degrees F
```



```
      FPC 9 MQ 0 TSen              OK         42 degrees C / 107 degrees F
      FPC 9 MQ 0 Chip              OK         43 degrees C / 109 degrees F
      FPC 9 QX 1 TSen              OK         38 degrees C / 100 degrees F
      FPC 9 QX 1 Chip              OK         40 degrees C / 104 degrees F
      FPC 9 LU 1 TCAM TSen         OK         38 degrees C / 100 degrees F
      FPC 9 LU 1 TCAM Chip         OK         38 degrees C / 100 degrees F
      FPC 9 LU 1 TSen              OK         38 degrees C / 100 degrees F
      FPC 9 LU 1 Chip              OK         41 degrees C / 105 degrees F
      FPC 9 MQ 1 TSen              OK         38 degrees C / 100 degrees F
      FPC 9 MQ 1 Chip              OK         41 degrees C / 105 degrees F
      FPC 10 Intake                OK         35 degrees C / 95 degrees F
      FPC 10 Exhaust A             OK         51 degrees C / 123 degrees F
      FPC 10 Exhaust B             OK         46 degrees C / 114 degrees F
      FPC 10 XL TSen               OK         42 degrees C / 107 degrees F
      FPC 10 XL Chip               OK         44 degrees C / 111 degrees F
      FPC 10 XL_XR0 TSen           OK         42 degrees C / 107 degrees F
      FPC 10 XL_XR0 Chip           OK         47 degrees C / 116 degrees F
      FPC 10 XL_XR1 TSen           OK         42 degrees C / 107 degrees F
      FPC 10 XL_XR1 Chip           OK         48 degrees C / 118 degrees F
      FPC 10 XQ TSen               OK         42 degrees C / 107 degrees F
      FPC 10 XQ Chip               OK         46 degrees C / 114 degrees F
      FPC 10 XQ_XR0 TSen           OK         42 degrees C / 107 degrees F
      FPC 10 XQ_XR0 Chip           OK         57 degrees C / 134 degrees F
      FPC 10 XQ_XR1 TSen           OK         42 degrees C / 107 degrees F
      FPC 10 XQ_XR1 Chip           OK         53 degrees C / 127 degrees F
      FPC 10 XM 0 TSen             OK         51 degrees C / 123 degrees F
      FPC 10 XM 0 Chip             OK         61 degrees C / 141 degrees F
      FPC 10 XM 1 TSen             OK         51 degrees C / 123 degrees F
      FPC 10 XM 1 Chip             OK         49 degrees C / 120 degrees F
      FPC 10 PLX PCIe Switch TSe   OK         51 degrees C / 123 degrees F
      FPC 10 PLX PCIe Switch Chi   OK         61 degrees C / 141 degrees F
      FPC 11 Intake                OK         33 degrees C / 91 degrees F
      FPC 11 Exhaust A             OK         33 degrees C / 91 degrees F
      FPC 11 Exhaust B             OK         34 degrees C / 93 degrees F
      FPC 11 LU 0 TSen             OK         50 degrees C / 122 degrees F
      FPC 11 LU 0 Chip             OK         48 degrees C / 118 degrees F
      FPC 11 LU 1 TSen             OK         50 degrees C / 122 degrees F
      FPC 11 LU 1 Chip             OK         50 degrees C / 122 degrees F
      FPC 11 LU 2 TSen             OK         50 degrees C / 122 degrees F
      FPC 11 LU 2 Chip             OK         41 degrees C / 105 degrees F
      FPC 11 LU 3 TSen             OK         50 degrees C / 122 degrees F
      FPC 11 LU 3 Chip             OK         48 degrees C / 118 degrees F
      FPC 11 XM 0 TSen             OK         50 degrees C / 122 degrees F
      FPC 11 XM 0 Chip             OK         57 degrees C / 134 degrees F
      FPC 11 XM 1 TSen             OK         50 degrees C / 122 degrees F
      FPC 11 XM 1 Chip             OK         52 degrees C / 125 degrees F
      FPC 11 PLX Switch TSen       OK         50 degrees C / 122 degrees F
      FPC 11 PLX Switch Chip       OK         45 degrees C / 113 degrees F
Fans  Top Fan Tray Temp            OK         42 degrees C / 107 degrees F
      Top Tray Fan 1               OK         Spinning at high speed
 Top Tray Fan 2               OK         Spinning at high speed
      Top Tray Fan 3               OK         Spinning at high speed
      Top Tray Fan 4               OK         Spinning at high speed
      Top Tray Fan 5               OK         Spinning at high speed
      Top Tray Fan 6               OK         Spinning at high speed
      Top Tray Fan 7               OK         Spinning at high speed
      Top Tray Fan 8               OK         Spinning at high speed
      Top Tray Fan 9               OK         Spinning at high speed
      Top Tray Fan 10              OK         Spinning at high speed
      Top Tray Fan 11              OK         Spinning at high speed
      Top Tray Fan 12              OK         Spinning at high speed
```

```
      Bottom Fan Tray Temp          OK          33 degrees C / 91 degrees F
      Bottom Tray Fan 1             OK          Spinning at high speed
      Bottom Tray Fan 2             OK          Spinning at high speed
      Bottom Tray Fan 3             OK          Spinning at high speed
      Bottom Tray Fan 4             OK          Spinning at high speed
      Bottom Tray Fan 5             OK          Spinning at high speed
      Bottom Tray Fan 6             OK          Spinning at high speed
      Bottom Tray Fan 7             OK          Spinning at high speed
      Bottom Tray Fan 8             OK          Spinning at high speed
      Bottom Tray Fan 9             OK          Spinning at high speed
      Bottom Tray Fan 10            OK          Spinning at high speed
      Bottom Tray Fan 11            OK          Spinning at high speed
      Bottom Tray Fan 12            OK          Spinning at high speed
```

show chassis environment (MX2020 Router)

```
user@host> show chassis environment
Class Item                          Status      Measurement
Temp  PSM 0                         Absent
      PSM 1                         Absent
      PSM 2                         OK          41 degrees C / 105 degrees F
      PSM 3                         OK          39 degrees C / 102 degrees F
      PSM 4                         OK          39 degrees C / 102 degrees F
      PSM 5                         OK          38 degrees C / 100 degrees F
      PSM 6                         OK          38 degrees C / 100 degrees F
      PSM 7                         OK          38 degrees C / 100 degrees F
      PSM 8                         OK          37 degrees C / 98 degrees F
      PSM 9                         Absent
      PSM 10                        Absent
      PSM 11                        OK          47 degrees C / 116 degrees F
      PSM 12                        OK          45 degrees C / 113 degrees F
      PSM 13                        OK          44 degrees C / 111 degrees F
      PSM 14                        OK          44 degrees C / 111 degrees F
      PSM 15                        OK          43 degrees C / 109 degrees F
      PSM 16                        OK          42 degrees C / 107 degrees F
      PSM 17                        OK          41 degrees C / 105 degrees F
      PDM 0                         OK
      PDM 1                         Absent
      PDM 2                         Absent
      PDM 3                         OK
      CB 0 IntakeA-Zone0            OK          45 degrees C / 113 degrees F
      CB 0 IntakeB-Zone1            OK          34 degrees C / 93 degrees F
      CB 0 IntakeC-Zone0            OK          48 degrees C / 118 degrees F
      CB 0 ExhaustA-Zone0           OK          45 degrees C / 113 degrees F
      CB 0 ExhaustB-Zone1           OK          37 degrees C / 98 degrees F
      CB 0 TCBC-Zone0               OK          41 degrees C / 105 degrees F
      CB 1 IntakeA-Zone0            OK          46 degrees C / 114 degrees F
      CB 1 IntakeB-Zone1            OK          42 degrees C / 107 degrees F
      CB 1 IntakeC-Zone0            OK          49 degrees C / 120 degrees F
      CB 1 ExhaustA-Zone0           OK          46 degrees C / 114 degrees F
      CB 1 ExhaustB-Zone1           OK          41 degrees C / 105 degrees F
      CB 1 TCBC-Zone0               OK          46 degrees C / 114 degrees F
      SPMB 0 Intake                 OK          33 degrees C / 91 degrees F
      SPMB 1 Intake                 OK          42 degrees C / 107 degrees F
      Routing Engine 0              OK          35 degrees C / 95 degrees F
      Routing Engine 0 CPU          OK          34 degrees C / 93 degrees F
      Routing Engine 1              OK          44 degrees C / 111 degrees F
      Routing Engine 1 CPU          OK          42 degrees C / 107 degrees F
      SFB 0 Intake-Zone0            OK          55 degrees C / 131 degrees F
      SFB 0 Exhaust-Zone1           OK          48 degrees C / 118 degrees F
      SFB 0 IntakeA-Zone0           OK          50 degrees C / 122 degrees F
```

```
SFB 0 IntakeB-Zone1           OK          40 degrees C / 104 degrees F
SFB 0 Exhaust-Zone0           OK          52 degrees C / 125 degrees F
SFB 0 SFB-XF2-Zone1           OK          61 degrees C / 141 degrees F
SFB 0 SFB-XF1-Zone0           OK          69 degrees C / 156 degrees F
SFB 0 SFB-XF0-Zone0           OK          68 degrees C / 154 degrees F
SFB 1 Intake-Zone0            OK          56 degrees C / 132 degrees F
SFB 1 Exhaust-Zone1           OK          47 degrees C / 116 degrees F
SFB 1 IntakeA-Zone0           OK          51 degrees C / 123 degrees F
SFB 1 IntakeB-Zone1           OK          40 degrees C / 104 degrees F
SFB 1 Exhaust-Zone0           OK          51 degrees C / 123 degrees F
SFB 1 SFB-XF2-Zone1           OK          62 degrees C / 143 degrees F
SFB 1 SFB-XF1-Zone0           OK          67 degrees C / 152 degrees F
SFB 1 SFB-XF0-Zone0           OK          69 degrees C / 156 degrees F
SFB 2 Intake-Zone0            OK          56 degrees C / 132 degrees F
SFB 2 Exhaust-Zone1           OK          47 degrees C / 116 degrees F
SFB 2 IntakeA-Zone0           OK          51 degrees C / 123 degrees F
SFB 2 IntakeB-Zone1           OK          40 degrees C / 104 degrees F
SFB 2 Exhaust-Zone0           OK          53 degrees C / 127 degrees F
SFB 2 SFB-XF2-Zone1           OK          65 degrees C / 149 degrees F
SFB 2 SFB-XF1-Zone0           OK          69 degrees C / 156 degrees F
SFB 2 SFB-XF0-Zone0           OK          70 degrees C / 158 degrees F
SFB 3 Intake-Zone0            OK          57 degrees C / 134 degrees F
SFB 3 Exhaust-Zone1           OK          48 degrees C / 118 degrees F
SFB 3 IntakeA-Zone0           OK          52 degrees C / 125 degrees F
SFB 3 IntakeB-Zone1           OK          41 degrees C / 105 degrees F
SFB 3 Exhaust-Zone0           OK          53 degrees C / 127 degrees F
SFB 3 SFB-XF2-Zone1           OK          66 degrees C / 150 degrees F
SFB 3 SFB-XF1-Zone0           OK          69 degrees C / 156 degrees F
SFB 3 SFB-XF0-Zone0           OK          71 degrees C / 159 degrees F
SFB 4 Intake-Zone0            OK          58 degrees C / 136 degrees F
SFB 4 Exhaust-Zone1           OK          49 degrees C / 120 degrees F
SFB 4 IntakeA-Zone0           OK          54 degrees C / 129 degrees F
SFB 4 IntakeB-Zone1           OK          42 degrees C / 107 degrees F
SFB 4 Exhaust-Zone0           OK          53 degrees C / 127 degrees F
SFB 4 SFB-XF2-Zone1           OK          64 degrees C / 147 degrees F
SFB 4 SFB-XF1-Zone0           OK          68 degrees C / 154 degrees F
SFB 4 SFB-XF0-Zone0           OK          71 degrees C / 159 degrees F
SFB 5 Intake-Zone0            OK          58 degrees C / 136 degrees F
SFB 5 Exhaust-Zone1           OK          50 degrees C / 122 degrees F
SFB 5 IntakeA-Zone0           OK          53 degrees C / 127 degrees F
SFB 5 IntakeB-Zone1           OK          43 degrees C / 109 degrees F
SFB 5 Exhaust-Zone0           OK          54 degrees C / 129 degrees F
SFB 5 SFB-XF2-Zone1           OK          66 degrees C / 150 degrees F
SFB 5 SFB-XF1-Zone0           OK          69 degrees C / 156 degrees F
SFB 5 SFB-XF0-Zone0           OK          74 degrees C / 165 degrees F
SFB 6 Intake-Zone0            OK          58 degrees C / 136 degrees F
SFB 6 Exhaust-Zone1           OK          49 degrees C / 120 degrees F
SFB 6 IntakeA-Zone0           OK          53 degrees C / 127 degrees F
SFB 6 IntakeB-Zone1           OK          43 degrees C / 109 degrees F
SFB 6 Exhaust-Zone0           OK          53 degrees C / 127 degrees F
SFB 6 SFB-XF2-Zone1           OK          65 degrees C / 149 degrees F
SFB 6 SFB-XF1-Zone0           OK          68 degrees C / 154 degrees F
SFB 6 SFB-XF0-Zone0           OK          72 degrees C / 161 degrees F
SFB 7 Intake-Zone0            OK          57 degrees C / 134 degrees F
SFB 7 Exhaust-Zone1           OK          50 degrees C / 122 degrees F
SFB 7 IntakeA-Zone0           OK          53 degrees C / 127 degrees F
SFB 7 IntakeB-Zone1           OK          43 degrees C / 109 degrees F
SFB 7 Exhaust-Zone0           OK          54 degrees C / 129 degrees F
SFB 7 SFB-XF2-Zone1           OK          68 degrees C / 154 degrees F
SFB 7 SFB-XF1-Zone0           OK          69 degrees C / 156 degrees F
SFB 7 SFB-XF0-Zone0           OK          73 degrees C / 163 degrees F
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FPC 0 Intake                  OK         41 degrees C / 105 degrees F
FPC 0 Exhaust A               OK         48 degrees C / 118 degrees F
FPC 0 Exhaust B               OK         62 degrees C / 143 degrees F
FPC 0 LU 0 TSen               OK         59 degrees C / 138 degrees F
FPC 0 LU 0 Chip               OK         62 degrees C / 143 degrees F
FPC 0 LU 1 TSen               OK         59 degrees C / 138 degrees F
FPC 0 LU 1 Chip               OK         64 degrees C / 147 degrees F
FPC 0 LU 2 TSen               OK         59 degrees C / 138 degrees F
FPC 0 LU 2 Chip               OK         53 degrees C / 127 degrees F
FPC 0 LU 3 TSen               OK         59 degrees C / 138 degrees F
FPC 0 LU 3 Chip               OK         53 degrees C / 127 degrees F
FPC 0 MQ 0 TSen               OK         47 degrees C / 116 degrees F
FPC 0 MQ 0 Chip               OK         49 degrees C / 120 degrees F
FPC 0 MQ 1 TSen               OK         47 degrees C / 116 degrees F
FPC 0 MQ 1 Chip               OK         51 degrees C / 123 degrees F
FPC 0 MQ 2 TSen               OK         47 degrees C / 116 degrees F
FPC 0 MQ 2 Chip               OK         44 degrees C / 111 degrees F
FPC 0 MQ 3 TSen               OK         47 degrees C / 116 degrees F
FPC 0 MQ 3 Chip               OK         45 degrees C / 113 degrees F
FPC 1 Intake                  OK         40 degrees C / 104 degrees F
FPC 1 Exhaust A               OK         49 degrees C / 120 degrees F
FPC 1 Exhaust B               OK         58 degrees C / 136 degrees F
FPC 1 LU 0 TSen               OK         55 degrees C / 131 degrees F
FPC 1 LU 0 Chip               OK         56 degrees C / 132 degrees F
FPC 1 LU 1 TSen               OK         55 degrees C / 131 degrees F
FPC 1 LU 1 Chip               OK         58 degrees C / 136 degrees F
FPC 1 LU 2 TSen               OK         55 degrees C / 131 degrees F
FPC 1 LU 2 Chip               OK         49 degrees C / 120 degrees F
FPC 1 LU 3 TSen               OK         55 degrees C / 131 degrees F
FPC 1 LU 3 Chip               OK         51 degrees C / 123 degrees F
FPC 1 MQ 0 TSen               OK         47 degrees C / 116 degrees F
FPC 1 MQ 0 Chip               OK         48 degrees C / 118 degrees F
FPC 1 MQ 1 TSen               OK         47 degrees C / 116 degrees F
FPC 1 MQ 1 Chip               OK         50 degrees C / 122 degrees F
FPC 1 MQ 2 TSen               OK         47 degrees C / 116 degrees F
FPC 1 MQ 2 Chip               OK         44 degrees C / 111 degrees F
FPC 1 MQ 3 TSen               OK         47 degrees C / 116 degrees F
FPC 1 MQ 3 Chip               OK         44 degrees C / 111 degrees F
FPC 2 Intake                  OK         39 degrees C / 102 degrees F
FPC 2 Exhaust A               OK         49 degrees C / 120 degrees F
FPC 2 Exhaust B               OK         61 degrees C / 141 degrees F
FPC 2 LU 0 TSen               OK         58 degrees C / 136 degrees F
FPC 2 LU 0 Chip               OK         60 degrees C / 140 degrees F
FPC 2 LU 1 TSen               OK         58 degrees C / 136 degrees F
FPC 2 LU 1 Chip               OK         65 degrees C / 149 degrees F
FPC 2 LU 2 TSen               OK         58 degrees C / 136 degrees F
FPC 2 LU 2 Chip               OK         51 degrees C / 123 degrees F
FPC 2 LU 3 TSen               OK         58 degrees C / 136 degrees F
FPC 2 LU 3 Chip               OK         53 degrees C / 127 degrees F
FPC 2 MQ 0 TSen               OK         47 degrees C / 116 degrees F
FPC 2 MQ 0 Chip               OK         50 degrees C / 122 degrees F
FPC 2 MQ 1 TSen               OK         47 degrees C / 116 degrees F
FPC 2 MQ 1 Chip               OK         52 degrees C / 125 degrees F
FPC 2 MQ 2 TSen               OK         47 degrees C / 116 degrees F
FPC 2 MQ 2 Chip               OK         45 degrees C / 113 degrees F
FPC 2 MQ 3 TSen               OK         47 degrees C / 116 degrees F
FPC 2 MQ 3 Chip               OK         46 degrees C / 114 degrees F
FPC 3 Intake                  OK         40 degrees C / 104 degrees F
FPC 3 Exhaust A               OK         49 degrees C / 120 degrees F
FPC 3 Exhaust B               OK         61 degrees C / 141 degrees F
FPC 3 LU 0 TSen               OK         58 degrees C / 136 degrees F
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FPC 3 LU 0 Chip              OK         61 degrees C / 141 degrees F
FPC 3 LU 1 TSen              OK         58 degrees C / 136 degrees F
FPC 3 LU 1 Chip              OK         62 degrees C / 143 degrees F
FPC 3 LU 2 TSen              OK         58 degrees C / 136 degrees F
FPC 3 LU 2 Chip              OK         51 degrees C / 123 degrees F
FPC 3 LU 3 TSen              OK         58 degrees C / 136 degrees F
FPC 3 LU 3 Chip              OK         53 degrees C / 127 degrees F
FPC 3 MQ 0 TSen              OK         48 degrees C / 118 degrees F
FPC 3 MQ 0 Chip              OK         50 degrees C / 122 degrees F
FPC 3 MQ 1 TSen              OK         48 degrees C / 118 degrees F
FPC 3 MQ 1 Chip              OK         54 degrees C / 129 degrees F
FPC 3 MQ 2 TSen              OK         48 degrees C / 118 degrees F
FPC 3 MQ 2 Chip              OK         45 degrees C / 113 degrees F
FPC 3 MQ 3 TSen              OK         48 degrees C / 118 degrees F
FPC 3 MQ 3 Chip              OK         48 degrees C / 118 degrees F
FPC 4 Intake                 OK         40 degrees C / 104 degrees F
FPC 4 Exhaust A              OK         49 degrees C / 120 degrees F
FPC 4 Exhaust B              OK         62 degrees C / 143 degrees F
FPC 4 LU 0 TSen              OK         59 degrees C / 138 degrees F
FPC 4 LU 0 Chip              OK         62 degrees C / 143 degrees F
FPC 4 LU 1 TSen              OK         59 degrees C / 138 degrees F
FPC 4 LU 1 Chip              OK         65 degrees C / 149 degrees F
FPC 4 LU 2 TSen              OK         59 degrees C / 138 degrees F
FPC 4 LU 2 Chip              OK         51 degrees C / 123 degrees F
FPC 4 LU 3 TSen              OK         59 degrees C / 138 degrees F
FPC 4 LU 3 Chip              OK         53 degrees C / 127 degrees F
FPC 4 MQ 0 TSen              OK         48 degrees C / 118 degrees F
FPC 4 MQ 0 Chip              OK         52 degrees C / 125 degrees F
FPC 4 MQ 1 TSen              OK         48 degrees C / 118 degrees F
FPC 4 MQ 1 Chip              OK         53 degrees C / 127 degrees F
FPC 4 MQ 2 TSen              OK         48 degrees C / 118 degrees F
FPC 4 MQ 2 Chip              OK         46 degrees C / 114 degrees F
FPC 4 MQ 3 TSen              OK         48 degrees C / 118 degrees F
FPC 4 MQ 3 Chip              OK         47 degrees C / 116 degrees F
FPC 5 Intake                 OK         41 degrees C / 105 degrees F
FPC 5 Exhaust A              OK         50 degrees C / 122 degrees F
FPC 5 Exhaust B              OK         63 degrees C / 145 degrees F
FPC 5 LU 0 TSen              OK         60 degrees C / 140 degrees F
FPC 5 LU 0 Chip              OK         63 degrees C / 145 degrees F
FPC 5 LU 1 TSen              OK         60 degrees C / 140 degrees F
FPC 5 LU 1 Chip              OK         66 degrees C / 150 degrees F
FPC 5 LU 2 TSen              OK         60 degrees C / 140 degrees F
FPC 5 LU 2 Chip              OK         56 degrees C / 132 degrees F
FPC 5 LU 3 TSen              OK         60 degrees C / 140 degrees F
FPC 5 LU 3 Chip              OK         54 degrees C / 129 degrees F
FPC 5 MQ 0 TSen              OK         49 degrees C / 120 degrees F
FPC 5 MQ 0 Chip              OK         52 degrees C / 125 degrees F
FPC 5 MQ 1 TSen              OK         49 degrees C / 120 degrees F
FPC 5 MQ 1 Chip              OK         53 degrees C / 127 degrees F
FPC 5 MQ 2 TSen              OK         49 degrees C / 120 degrees F
FPC 5 MQ 2 Chip              OK         48 degrees C / 118 degrees F
FPC 5 MQ 3 TSen              OK         49 degrees C / 120 degrees F
FPC 5 MQ 3 Chip              OK         47 degrees C / 116 degrees F
FPC 6 Intake                 OK         42 degrees C / 107 degrees F
FPC 6 Exhaust A              OK         51 degrees C / 123 degrees F
FPC 6 Exhaust B              OK         63 degrees C / 145 degrees F
FPC 6 LU 0 TSen              OK         61 degrees C / 141 degrees F
FPC 6 LU 0 Chip              OK         64 degrees C / 147 degrees F
FPC 6 LU 1 TSen              OK         61 degrees C / 141 degrees F
FPC 6 LU 1 Chip              OK         66 degrees C / 150 degrees F
FPC 6 LU 2 TSen              OK         61 degrees C / 141 degrees F
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FPC 6 LU 2 Chip              OK          56 degrees C / 132 degrees F
FPC 6 LU 3 TSen              OK          61 degrees C / 141 degrees F
FPC 6 LU 3 Chip              OK          56 degrees C / 132 degrees F
FPC 6 MQ 0 TSen              OK          50 degrees C / 122 degrees F
FPC 6 MQ 0 Chip              OK          56 degrees C / 132 degrees F
FPC 6 MQ 1 TSen              OK          50 degrees C / 122 degrees F
FPC 6 MQ 1 Chip              OK          59 degrees C / 138 degrees F
FPC 6 MQ 2 TSen              OK          50 degrees C / 122 degrees F
FPC 6 MQ 2 Chip              OK          49 degrees C / 120 degrees F
FPC 6 MQ 3 TSen              OK          50 degrees C / 122 degrees F
FPC 6 MQ 3 Chip              OK          49 degrees C / 120 degrees F
FPC 7 Intake                 OK          41 degrees C / 105 degrees F
FPC 7 Exhaust A              OK          51 degrees C / 123 degrees F
FPC 7 Exhaust B              OK          63 degrees C / 145 degrees F
FPC 7 LU 0 TSen              OK          60 degrees C / 140 degrees F
FPC 7 LU 0 Chip              OK          61 degrees C / 141 degrees F
FPC 7 LU 1 TSen              OK          60 degrees C / 140 degrees F
FPC 7 LU 1 Chip              OK          65 degrees C / 149 degrees F
FPC 7 LU 2 TSen              OK          60 degrees C / 140 degrees F
FPC 7 LU 2 Chip              OK          54 degrees C / 129 degrees F
FPC 7 LU 3 TSen              OK          60 degrees C / 140 degrees F
FPC 7 LU 3 Chip              OK          53 degrees C / 127 degrees F
FPC 7 MQ 0 TSen              OK          50 degrees C / 122 degrees F
FPC 7 MQ 0 Chip              OK          53 degrees C / 127 degrees F
FPC 7 MQ 1 TSen              OK          50 degrees C / 122 degrees F
FPC 7 MQ 1 Chip              OK          54 degrees C / 129 degrees F
FPC 7 MQ 2 TSen              OK          50 degrees C / 122 degrees F
FPC 7 MQ 2 Chip              OK          47 degrees C / 116 degrees F
FPC 7 MQ 3 TSen              OK          50 degrees C / 122 degrees F
FPC 7 MQ 3 Chip              OK          47 degrees C / 116 degrees F
FPC 8 Intake                 OK          41 degrees C / 105 degrees F
FPC 8 Exhaust A              OK          50 degrees C / 122 degrees F
FPC 8 Exhaust B              OK          62 degrees C / 143 degrees F
FPC 8 LU 0 TSen              OK          59 degrees C / 138 degrees F
FPC 8 LU 0 Chip              OK          62 degrees C / 143 degrees F
FPC 8 LU 1 TSen              OK          59 degrees C / 138 degrees F
FPC 8 LU 1 Chip              OK          64 degrees C / 147 degrees F
FPC 8 LU 2 TSen              OK          59 degrees C / 138 degrees F
FPC 8 LU 2 Chip              OK          55 degrees C / 131 degrees F
FPC 8 LU 3 TSen              OK          59 degrees C / 138 degrees F
FPC 8 LU 3 Chip              OK          54 degrees C / 129 degrees F
FPC 8 MQ 0 TSen              OK          49 degrees C / 120 degrees F
FPC 8 MQ 0 Chip              OK          51 degrees C / 123 degrees F
FPC 8 MQ 1 TSen              OK          49 degrees C / 120 degrees F
FPC 8 MQ 1 Chip              OK          52 degrees C / 125 degrees F
FPC 8 MQ 2 TSen              OK          49 degrees C / 120 degrees F
FPC 8 MQ 2 Chip              OK          46 degrees C / 114 degrees F
FPC 8 MQ 3 TSen              OK          49 degrees C / 120 degrees F
FPC 8 MQ 3 Chip              OK          47 degrees C / 116 degrees F
FPC 9 Intake                 OK          42 degrees C / 107 degrees F
FPC 9 Exhaust A              OK          51 degrees C / 123 degrees F
FPC 9 Exhaust B              OK          63 degrees C / 145 degrees F
FPC 9 LU 0 TSen              OK          60 degrees C / 140 degrees F
FPC 9 LU 0 Chip              OK          65 degrees C / 149 degrees F
FPC 9 LU 1 TSen              OK          60 degrees C / 140 degrees F
FPC 9 LU 1 Chip              OK          67 degrees C / 152 degrees F
FPC 9 LU 2 TSen              OK          60 degrees C / 140 degrees F
FPC 9 LU 2 Chip              OK          54 degrees C / 129 degrees F
FPC 9 LU 3 TSen              OK          60 degrees C / 140 degrees F
FPC 9 LU 3 Chip              OK          54 degrees C / 129 degrees F
FPC 9 MQ 0 TSen              OK          51 degrees C / 123 degrees F
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FPC 9 MQ 0 Chip               OK          55 degrees C / 131 degrees F
FPC 9 MQ 1 TSen               OK          51 degrees C / 123 degrees F
FPC 9 MQ 1 Chip               OK          59 degrees C / 138 degrees F
FPC 9 MQ 2 TSen               OK          51 degrees C / 123 degrees F
FPC 9 MQ 2 Chip               OK          49 degrees C / 120 degrees F
FPC 9 MQ 3 TSen               OK          51 degrees C / 123 degrees F
FPC 9 MQ 3 Chip               OK          49 degrees C / 120 degrees F
FPC 10 Intake                 OK          44 degrees C / 111 degrees F
FPC 10 Exhaust A              OK          49 degrees C / 120 degrees F
FPC 10 Exhaust B              OK          55 degrees C / 131 degrees F
FPC 10 LU 0 TSen              OK          54 degrees C / 129 degrees F
FPC 10 LU 0 Chip              OK          55 degrees C / 131 degrees F
FPC 10 LU 1 TSen              OK          54 degrees C / 129 degrees F
FPC 10 LU 1 Chip              OK          59 degrees C / 138 degrees F
FPC 10 LU 2 TSen              OK          54 degrees C / 129 degrees F
FPC 10 LU 2 Chip              OK          52 degrees C / 125 degrees F
FPC 10 LU 3 TSen              OK          54 degrees C / 129 degrees F
FPC 10 LU 3 Chip              OK          51 degrees C / 123 degrees F
FPC 10 MQ 0 TSen              OK          48 degrees C / 118 degrees F
FPC 10 MQ 0 Chip              OK          49 degrees C / 120 degrees F
FPC 10 MQ 1 TSen              OK          48 degrees C / 118 degrees F
FPC 10 MQ 1 Chip              OK          52 degrees C / 125 degrees F
FPC 10 MQ 2 TSen              OK          48 degrees C / 118 degrees F
FPC 10 MQ 2 Chip              OK          47 degrees C / 116 degrees F
FPC 10 MQ 3 TSen              OK          48 degrees C / 118 degrees F
FPC 10 MQ 3 Chip              OK          47 degrees C / 116 degrees F
FPC 11 Intake                 OK          30 degrees C / 86 degrees F
FPC 11 Exhaust A              OK          35 degrees C / 95 degrees F
FPC 11 Exhaust B              OK          30 degrees C / 86 degrees F
FPC 11 LU 0 TSen              OK          57 degrees C / 134 degrees F
FPC 11 LU 0 Chip              OK          58 degrees C / 136 degrees F
FPC 11 LU 1 TSen              OK          57 degrees C / 134 degrees F
FPC 11 LU 1 Chip              OK          62 degrees C / 143 degrees F
FPC 11 LU 2 TSen              OK          57 degrees C / 134 degrees F
FPC 11 LU 2 Chip              OK          53 degrees C / 127 degrees F
FPC 11 LU 3 TSen              OK          57 degrees C / 134 degrees F
FPC 11 LU 3 Chip              OK          54 degrees C / 129 degrees F
FPC 11 MQ 0 TSen              OK          52 degrees C / 125 degrees F
FPC 11 MQ 0 Chip              OK          52 degrees C / 125 degrees F
FPC 11 MQ 1 TSen              OK          52 degrees C / 125 degrees F
FPC 11 MQ 1 Chip              OK          57 degrees C / 134 degrees F
FPC 11 MQ 2 TSen              OK          52 degrees C / 125 degrees F
FPC 11 MQ 2 Chip              OK          48 degrees C / 118 degrees F
FPC 11 MQ 3 TSen              OK          52 degrees C / 125 degrees F
FPC 11 MQ 3 Chip              OK          52 degrees C / 125 degrees F
FPC 12 Intake                 OK          40 degrees C / 104 degrees F
FPC 12 Exhaust A              OK          47 degrees C / 116 degrees F
FPC 12 Exhaust B              OK          52 degrees C / 125 degrees F
FPC 12 LU 0 TSen              OK          51 degrees C / 123 degrees F
FPC 12 LU 0 Chip              OK          52 degrees C / 125 degrees F
FPC 12 LU 1 TSen              OK          51 degrees C / 123 degrees F
FPC 12 LU 1 Chip              OK          55 degrees C / 131 degrees F
FPC 12 LU 2 TSen              OK          51 degrees C / 123 degrees F
FPC 12 LU 2 Chip              OK          47 degrees C / 116 degrees F
FPC 12 LU 3 TSen              OK          51 degrees C / 123 degrees F
FPC 12 LU 3 Chip              OK          50 degrees C / 122 degrees F
FPC 12 MQ 0 TSen              OK          46 degrees C / 114 degrees F
FPC 12 MQ 0 Chip              OK          46 degrees C / 114 degrees F
FPC 12 MQ 1 TSen              OK          46 degrees C / 114 degrees F
FPC 12 MQ 1 Chip              OK          50 degrees C / 122 degrees F
FPC 12 MQ 2 TSen              OK          46 degrees C / 114 degrees F
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FPC 12 MQ 2 Chip              OK          44 degrees C / 111 degrees F
FPC 12 MQ 3 TSen              OK          46 degrees C / 114 degrees F
FPC 12 MQ 3 Chip              OK          46 degrees C / 114 degrees F
FPC 13 Intake                 OK          40 degrees C / 104 degrees F
FPC 13 Exhaust A              OK          48 degrees C / 118 degrees F
FPC 13 Exhaust B              OK          52 degrees C / 125 degrees F
FPC 13 LU 0 TSen              OK          51 degrees C / 123 degrees F
FPC 13 LU 0 Chip              OK          52 degrees C / 125 degrees F
FPC 13 LU 1 TSen              OK          51 degrees C / 123 degrees F
FPC 13 LU 1 Chip              OK          55 degrees C / 131 degrees F
FPC 13 LU 2 TSen              OK          51 degrees C / 123 degrees F
FPC 13 LU 2 Chip              OK          48 degrees C / 118 degrees F
FPC 13 LU 3 TSen              OK          51 degrees C / 123 degrees F
FPC 13 LU 3 Chip              OK          48 degrees C / 118 degrees F
FPC 13 MQ 0 TSen              OK          46 degrees C / 114 degrees F
FPC 13 MQ 0 Chip              OK          46 degrees C / 114 degrees F
FPC 13 MQ 1 TSen              OK          46 degrees C / 114 degrees F
FPC 13 MQ 1 Chip              OK          50 degrees C / 122 degrees F
FPC 13 MQ 2 TSen              OK          46 degrees C / 114 degrees F
FPC 13 MQ 2 Chip              OK          44 degrees C / 111 degrees F
FPC 13 MQ 3 TSen              OK          46 degrees C / 114 degrees F
FPC 13 MQ 3 Chip              OK          46 degrees C / 114 degrees F
FPC 14 Intake                 OK          40 degrees C / 104 degrees F
FPC 14 Exhaust A              OK          50 degrees C / 122 degrees F
FPC 14 Exhaust B              OK          51 degrees C / 123 degrees F
FPC 14 LU 0 TSen              OK          50 degrees C / 122 degrees F
FPC 14 LU 0 Chip              OK          50 degrees C / 122 degrees F
FPC 14 LU 1 TSen              OK          50 degrees C / 122 degrees F
FPC 14 LU 1 Chip              OK          54 degrees C / 129 degrees F
FPC 14 LU 2 TSen              OK          50 degrees C / 122 degrees F
FPC 14 LU 2 Chip              OK          47 degrees C / 116 degrees F
FPC 14 LU 3 TSen              OK          50 degrees C / 122 degrees F
FPC 14 LU 3 Chip              OK          49 degrees C / 120 degrees F
FPC 14 MQ 0 TSen              OK          47 degrees C / 116 degrees F
FPC 14 MQ 0 Chip              OK          46 degrees C / 114 degrees F
FPC 14 MQ 1 TSen              OK          47 degrees C / 116 degrees F
FPC 14 MQ 1 Chip              OK          51 degrees C / 123 degrees F
FPC 14 MQ 2 TSen              OK          47 degrees C / 116 degrees F
FPC 14 MQ 2 Chip              OK          45 degrees C / 113 degrees F
FPC 14 MQ 3 TSen              OK          47 degrees C / 116 degrees F
FPC 14 MQ 3 Chip              OK          48 degrees C / 118 degrees F
FPC 15 Intake                 OK          44 degrees C / 111 degrees F
FPC 15 Exhaust A              OK          49 degrees C / 120 degrees F
FPC 15 Exhaust B              OK          60 degrees C / 140 degrees F
FPC 15 LU 0 TSen              OK          50 degrees C / 122 degrees F
FPC 15 LU 0 Chip              OK          56 degrees C / 132 degrees F
FPC 15 LU 1 TSen              OK          50 degrees C / 122 degrees F
FPC 15 LU 1 Chip              OK          50 degrees C / 122 degrees F
FPC 15 LU 2 TSen              OK          50 degrees C / 122 degrees F
FPC 15 LU 2 Chip              OK          58 degrees C / 136 degrees F
FPC 15 LU 3 TSen              OK          50 degrees C / 122 degrees F
FPC 15 LU 3 Chip              OK          63 degrees C / 145 degrees F
FPC 15 XM 0 TSen              OK          50 degrees C / 122 degrees F
FPC 15 XM 0 Chip              OK          56 degrees C / 132 degrees F
FPC 15 XF 0 TSen              OK          50 degrees C / 122 degrees F
FPC 15 XF 0 Chip              OK          68 degrees C / 154 degrees F
FPC 15 PLX Switch TSen        OK          50 degrees C / 122 degrees F
FPC 15 PLX Switch Chip        OK          56 degrees C / 132 degrees F
FPC 16 Intake                 OK          42 degrees C / 107 degrees F
FPC 16 Exhaust A              OK          51 degrees C / 123 degrees F
FPC 16 Exhaust B              OK          53 degrees C / 127 degrees F
```



```
FPC 16 LU 0 TSen              OK         51 degrees C / 123 degrees F
FPC 16 LU 0 Chip              OK         52 degrees C / 125 degrees F
FPC 16 LU 1 TSen              OK         51 degrees C / 123 degrees F
FPC 16 LU 1 Chip              OK         55 degrees C / 131 degrees F
FPC 16 LU 2 TSen              OK         51 degrees C / 123 degrees F
FPC 16 LU 2 Chip              OK         48 degrees C / 118 degrees F
FPC 16 LU 3 TSen              OK         51 degrees C / 123 degrees F
FPC 16 LU 3 Chip              OK         49 degrees C / 120 degrees F
FPC 16 MQ 0 TSen              OK         49 degrees C / 120 degrees F
FPC 16 MQ 0 Chip              OK         48 degrees C / 118 degrees F
FPC 16 MQ 1 TSen              OK         49 degrees C / 120 degrees F
FPC 16 MQ 1 Chip              OK         53 degrees C / 127 degrees F
FPC 16 MQ 2 TSen              OK         49 degrees C / 120 degrees F
FPC 16 MQ 2 Chip              OK         46 degrees C / 114 degrees F
FPC 16 MQ 3 TSen              OK         49 degrees C / 120 degrees F
FPC 16 MQ 3 Chip              OK         49 degrees C / 120 degrees F
FPC 17 Intake                 OK         43 degrees C / 109 degrees F
FPC 17 Exhaust A              OK         51 degrees C / 123 degrees F
FPC 17 Exhaust B              OK         55 degrees C / 131 degrees F
FPC 17 LU 0 TSen              OK         54 degrees C / 129 degrees F
FPC 17 LU 0 Chip              OK         57 degrees C / 134 degrees F
FPC 17 LU 1 TSen              OK         54 degrees C / 129 degrees F
FPC 17 LU 1 Chip              OK         60 degrees C / 140 degrees F
FPC 17 LU 2 TSen              OK         54 degrees C / 129 degrees F
FPC 17 LU 2 Chip              OK         53 degrees C / 127 degrees F
FPC 17 LU 3 TSen              OK         54 degrees C / 129 degrees F
FPC 17 LU 3 Chip              OK         53 degrees C / 127 degrees F
FPC 17 MQ 0 TSen              OK         49 degrees C / 120 degrees F
FPC 17 MQ 0 Chip              OK         50 degrees C / 122 degrees F
FPC 17 MQ 1 TSen              OK         49 degrees C / 120 degrees F
FPC 17 MQ 1 Chip              OK         54 degrees C / 129 degrees F
FPC 17 MQ 2 TSen              OK         49 degrees C / 120 degrees F
FPC 17 MQ 2 Chip              OK         47 degrees C / 116 degrees F
FPC 17 MQ 3 TSen              OK         49 degrees C / 120 degrees F
FPC 17 MQ 3 Chip              OK         51 degrees C / 123 degrees F
FPC 18 Intake                 OK         44 degrees C / 111 degrees F
FPC 18 Exhaust A              OK         53 degrees C / 127 degrees F
FPC 18 Exhaust B              OK         57 degrees C / 134 degrees F
FPC 18 LU 0 TSen              OK         56 degrees C / 132 degrees F
FPC 18 LU 0 Chip              OK         57 degrees C / 134 degrees F
FPC 18 LU 1 TSen              OK         56 degrees C / 132 degrees F
FPC 18 LU 1 Chip              OK         62 degrees C / 143 degrees F
FPC 18 LU 2 TSen              OK         56 degrees C / 132 degrees F
FPC 18 LU 2 Chip              OK         53 degrees C / 127 degrees F
FPC 18 LU 3 TSen              OK         56 degrees C / 132 degrees F
FPC 18 LU 3 Chip              OK         55 degrees C / 131 degrees F
FPC 18 MQ 0 TSen              OK         51 degrees C / 123 degrees F
FPC 18 MQ 0 Chip              OK         54 degrees C / 129 degrees F
FPC 18 MQ 1 TSen              OK         51 degrees C / 123 degrees F
FPC 18 MQ 1 Chip              OK         58 degrees C / 136 degrees F
FPC 18 MQ 2 TSen              OK         51 degrees C / 123 degrees F
FPC 18 MQ 2 Chip              OK         50 degrees C / 122 degrees F
FPC 18 MQ 3 TSen              OK         51 degrees C / 123 degrees F
FPC 18 MQ 3 Chip              OK         53 degrees C / 127 degrees F
FPC 19 Intake                 OK         48 degrees C / 118 degrees F
FPC 19 Exhaust A              OK         56 degrees C / 132 degrees F
FPC 19 Exhaust B              OK         64 degrees C / 147 degrees F
FPC 19 LU 0 TSen              OK         63 degrees C / 145 degrees F
FPC 19 LU 0 Chip              OK         64 degrees C / 147 degrees F
FPC 19 LU 1 TSen              OK         63 degrees C / 145 degrees F
FPC 19 LU 1 Chip              OK         70 degrees C / 158 degrees F
```



```
FPC 19 LU 2 TSen              OK          63 degrees C / 145 degrees F
FPC 19 LU 2 Chip              OK          61 degrees C / 141 degrees F
FPC 19 LU 3 TSen              OK          63 degrees C / 145 degrees F
FPC 19 LU 3 Chip              OK          62 degrees C / 143 degrees F
FPC 19 MQ 0 TSen              OK          56 degrees C / 132 degrees F
FPC 19 MQ 0 Chip              OK          60 degrees C / 140 degrees F
FPC 19 MQ 1 TSen              OK          56 degrees C / 132 degrees F
FPC 19 MQ 1 Chip              OK          62 degrees C / 143 degrees F
FPC 19 MQ 2 TSen              OK          56 degrees C / 132 degrees F
FPC 19 MQ 2 Chip              OK          56 degrees C / 132 degrees F
FPC 19 MQ 3 TSen              OK          56 degrees C / 132 degrees F
FPC 19 MQ 3 Chip              OK          57 degrees C / 134 degrees F
ADC 0 Intake                  OK          40 degrees C / 104 degrees F
ADC 0 Exhaust                 OK          52 degrees C / 125 degrees F
ADC 0 ADC-XF1                 OK          59 degrees C / 138 degrees F
ADC 0 ADC-XF0                 OK          66 degrees C / 150 degrees F
ADC 1 Intake                  OK          38 degrees C / 100 degrees F
ADC 1 Exhaust                 OK          50 degrees C / 122 degrees F
ADC 1 ADC-XF1                 OK          59 degrees C / 138 degrees F
ADC 1 ADC-XF0                 OK          63 degrees C / 145 degrees F
ADC 2 Intake                  OK          37 degrees C / 98 degrees F
ADC 2 Exhaust                 OK          52 degrees C / 125 degrees F
ADC 2 ADC-XF1                 OK          53 degrees C / 127 degrees F
ADC 2 ADC-XF0                 OK          61 degrees C / 141 degrees F
ADC 3 Intake                  OK          40 degrees C / 104 degrees F
ADC 3 Exhaust                 OK          51 degrees C / 123 degrees F
ADC 3 ADC-XF1                 OK          61 degrees C / 141 degrees F
ADC 3 ADC-XF0                 OK          64 degrees C / 147 degrees F
ADC 4 Intake                  OK          39 degrees C / 102 degrees F
ADC 4 Exhaust                 OK          51 degrees C / 123 degrees F
ADC 4 ADC-XF1                 OK          60 degrees C / 140 degrees F
ADC 4 ADC-XF0                 OK          63 degrees C / 145 degrees F
ADC 5 Intake                  OK          38 degrees C / 100 degrees F
ADC 5 Exhaust                 OK          54 degrees C / 129 degrees F
ADC 5 ADC-XF1                 OK          56 degrees C / 132 degrees F
ADC 5 ADC-XF0                 OK          67 degrees C / 152 degrees F
ADC 6 Intake                  OK          39 degrees C / 102 degrees F
ADC 6 Exhaust                 OK          52 degrees C / 125 degrees F
ADC 6 ADC-XF1                 OK          59 degrees C / 138 degrees F
ADC 6 ADC-XF0                 OK          66 degrees C / 150 degrees F
ADC 7 Intake                  OK          39 degrees C / 102 degrees F
ADC 7 Exhaust                 OK          54 degrees C / 129 degrees F
ADC 7 ADC-XF1                 OK          62 degrees C / 143 degrees F
ADC 7 ADC-XF0                 OK          70 degrees C / 158 degrees F
ADC 8 Intake                  OK          39 degrees C / 102 degrees F
ADC 8 Exhaust                 OK          52 degrees C / 125 degrees F
ADC 8 ADC-XF1                 OK          61 degrees C / 141 degrees F
ADC 8 ADC-XF0                 OK          65 degrees C / 149 degrees F
ADC 9 Intake                  OK          41 degrees C / 105 degrees F
ADC 9 Exhaust                 OK          51 degrees C / 123 degrees F
ADC 9 ADC-XF1                 OK          63 degrees C / 145 degrees F
ADC 9 ADC-XF0                 OK          63 degrees C / 145 degrees F
ADC 10 Intake                 OK          48 degrees C / 118 degrees F
ADC 10 Exhaust                OK          53 degrees C / 127 degrees F
ADC 10 ADC-XF1                OK          67 degrees C / 152 degrees F
ADC 10 ADC-XF0                OK          66 degrees C / 150 degrees F
ADC 12 Intake                 OK          49 degrees C / 120 degrees F
ADC 12 Exhaust                OK          54 degrees C / 129 degrees F
ADC 12 ADC-XF1                OK          67 degrees C / 152 degrees F
ADC 12 ADC-XF0                OK          67 degrees C / 152 degrees F
ADC 13 Intake                 OK          49 degrees C / 120 degrees F
```



```
      ADC 13 Exhaust              OK         57 degrees C / 134 degrees F
      ADC 13 ADC-XF1              OK         66 degrees C / 150 degrees F
      ADC 13 ADC-XF0              OK         69 degrees C / 156 degrees F
      ADC 14 Intake               OK         51 degrees C / 123 degrees F
      ADC 14 Exhaust              OK         59 degrees C / 138 degrees F
      ADC 14 ADC-XF1              OK         69 degrees C / 156 degrees F
      ADC 14 ADC-XF0              OK         74 degrees C / 165 degrees F
      ADC 15 Intake               OK         50 degrees C / 122 degrees F
      ADC 15 Exhaust              OK         59 degrees C / 138 degrees F
      ADC 15 ADC-XF1              OK         68 degrees C / 154 degrees F
      ADC 15 ADC-XF0              OK         69 degrees C / 156 degrees F
      ADC 16 Intake               OK         52 degrees C / 125 degrees F
      ADC 16 Exhaust              OK         58 degrees C / 136 degrees F
      ADC 16 ADC-XF1              OK         68 degrees C / 154 degrees F
      ADC 16 ADC-XF0              OK         70 degrees C / 158 degrees F
      ADC 17 Intake               OK         52 degrees C / 125 degrees F
      ADC 17 Exhaust              OK         59 degrees C / 138 degrees F
      ADC 17 ADC-XF1              OK         69 degrees C / 156 degrees F
      ADC 17 ADC-XF0              OK         71 degrees C / 159 degrees F
      ADC 18 Intake               OK         53 degrees C / 127 degrees F
      ADC 18 Exhaust              OK         59 degrees C / 138 degrees F
      ADC 18 ADC-XF1              OK         68 degrees C / 154 degrees F
      ADC 18 ADC-XF0              OK         73 degrees C / 163 degrees F
      ADC 19 Intake               OK         50 degrees C / 122 degrees F
      ADC 19 Exhaust              OK         59 degrees C / 138 degrees F
      ADC 19 ADC-XF1              OK         68 degrees C / 154 degrees F
      ADC 19 ADC-XF0              OK         72 degrees C / 161 degrees F
Fans  Fan Tray 0 Fan 1            OK         7440 RPM
      Fan Tray 0 Fan 2            OK         7200 RPM
      Fan Tray 0 Fan 3            OK         6960 RPM
      Fan Tray 0 Fan 4            OK         7200 RPM
      Fan Tray 0 Fan 5            OK         7080 RPM
      Fan Tray 0 Fan 6            OK         6840 RPM
      Fan Tray 1 Fan 1            OK         6840 RPM
      Fan Tray 1 Fan 2            OK         6960 RPM
      Fan Tray 1 Fan 3            OK         6960 RPM
      Fan Tray 1 Fan 4            OK         7080 RPM
      Fan Tray 1 Fan 5            OK         6960 RPM
      Fan Tray 1 Fan 6            OK         6960 RPM
      Fan Tray 2 Fan 1            OK         8640 RPM
      Fan Tray 2 Fan 2            OK         8640 RPM
      Fan Tray 2 Fan 3            OK         8760 RPM
      Fan Tray 2 Fan 4            OK         8760 RPM
      Fan Tray 2 Fan 5            OK         8640 RPM
      Fan Tray 2 Fan 6            OK         8640 RPM
      Fan Tray 3 Fan 1            OK         8520 RPM
      Fan Tray 3 Fan 2            OK         8520 RPM
      Fan Tray 3 Fan 3            OK         8640 RPM
      Fan Tray 3 Fan 4            OK         8640 RPM
      Fan Tray 3 Fan 5            OK         8520 RPM
      Fan Tray 3 Fan 6            OK         8520 RPM
```

show chassis environment (MX2020 Router with MPC5EQ and MPC6E)

```
Class Item                        Status     Measurement
Temp  PSM 0                       OK         32 degrees C / 89 degrees F
      PSM 1                       OK         32 degrees C / 89 degrees F
      PSM 2                       OK         32 degrees C / 89 degrees F
      PSM 3                       OK         32 degrees C / 89 degrees F
      PSM 4                       OK         32 degrees C / 89 degrees F
      PSM 5                       OK         33 degrees C / 91 degrees F
```

```
          PSM 6                         OK          32 degrees C / 89 degrees F
          PSM 7                         OK          32 degrees C / 89 degrees F
          PSM 8                         OK          32 degrees C / 89 degrees F
          PSM 9                         Absent
          PSM 10                        Absent
          PSM 11                        Absent
          PSM 12                        OK          33 degrees C / 91 degrees F
          PSM 13                        OK          33 degrees C / 91 degrees F
          PSM 14                        OK          34 degrees C / 93 degrees F
          PSM 15                        OK          34 degrees C / 93 degrees F
          PSM 16                        OK          33 degrees C / 91 degrees F
          PSM 17                        OK          33 degrees C / 91 degrees F
          PDM 0                         OK
          PDM 1                         OK
          PDM 2                         OK
          PDM 3                         OK
          CB 0 IntakeA-Zone0            OK          34 degrees C / 93 degrees F
          CB 0 IntakeB-Zone1            OK          26 degrees C / 78 degrees F
          CB 0 IntakeC-Zone0            OK          38 degrees C / 100 degrees F
          CB 0 ExhaustA-Zone0           OK          34 degrees C / 93 degrees F
          CB 0 ExhaustB-Zone1           OK          27 degrees C / 80 degrees F
          CB 0 TCBC-Zone0               OK          32 degrees C / 89 degrees F
          CB 1 IntakeA-Zone0            OK          24 degrees C / 75 degrees F
          CB 1 IntakeB-Zone1            OK          22 degrees C / 71 degrees F
          CB 1 IntakeC-Zone0            OK          34 degrees C / 93 degrees F
          CB 1 ExhaustA-Zone0           OK          31 degrees C / 87 degrees F
          CB 1 ExhaustB-Zone1           OK          24 degrees C / 75 degrees F
          CB 1 TCBC-Zone0               OK          27 degrees C / 80 degrees F
          SPMB 0 Intake                 OK          25 degrees C / 77 degrees F
          SPMB 1 Intake                 OK          23 degrees C / 73 degrees F
          Routing Engine 0              OK          28 degrees C / 82 degrees F
          Routing Engine 0 CPU          OK          25 degrees C / 77 degrees F
          Routing Engine 1              OK          25 degrees C / 77 degrees F
          Routing Engine 1 CPU          OK          24 degrees C / 75 degrees F
          SFB 0 Intake-Zone0            OK          45 degrees C / 113 degrees F
          SFB 0 Exhaust-Zone1           OK          34 degrees C / 93 degrees F
          SFB 0 IntakeA-Zone0           OK          32 degrees C / 89 degrees F
          SFB 0 IntakeB-Zone1           OK          28 degrees C / 82 degrees F
          SFB 0 Exhaust-Zone0           OK          36 degrees C / 96 degrees F
          SFB 0 SFB-XF2-Zone1           OK          46 degrees C / 114 degrees F
          SFB 0 SFB-XF1-Zone0           OK          48 degrees C / 118 degrees F
          SFB 0 SFB-XF0-Zone0           OK          60 degrees C / 140 degrees F
          SFB 1 Intake-Zone0            OK          44 degrees C / 111 degrees F
          SFB 1 Exhaust-Zone1           OK          34 degrees C / 93 degrees F
          SFB 1 IntakeA-Zone0           OK          35 degrees C / 95 degrees F
          SFB 1 IntakeB-Zone1           OK          27 degrees C / 80 degrees F
          SFB 1 Exhaust-Zone0           OK          37 degrees C / 98 degrees F
          SFB 1 SFB-XF2-Zone1           OK          47 degrees C / 116 degrees F
          SFB 1 SFB-XF1-Zone0           OK          49 degrees C / 120 degrees F
     SFB 1 SFB-XF0-Zone0           OK          56 degrees C / 132 degrees F
          SFB 2 Intake-Zone0            OK          41 degrees C / 105 degrees F
          SFB 2 Exhaust-Zone1           OK          34 degrees C / 93 degrees F
          SFB 2 IntakeA-Zone0           OK          35 degrees C / 95 degrees F
          SFB 2 IntakeB-Zone1           OK          28 degrees C / 82 degrees F
          SFB 2 Exhaust-Zone0           OK          37 degrees C / 98 degrees F
          SFB 2 SFB-XF2-Zone1           OK          47 degrees C / 116 degrees F
          SFB 2 SFB-XF1-Zone0           OK          55 degrees C / 131 degrees F
          SFB 2 SFB-XF0-Zone0           OK          55 degrees C / 131 degrees F
          SFB 3 Intake-Zone0            OK          43 degrees C / 109 degrees F
          SFB 3 Exhaust-Zone1           OK          33 degrees C / 91 degrees F
          SFB 3 IntakeA-Zone0           OK          35 degrees C / 95 degrees F
```



```
          SFB 3 IntakeB-Zone1          OK         27 degrees C / 80 degrees F
          SFB 3 Exhaust-Zone0          OK         36 degrees C / 96 degrees F
          SFB 3 SFB-XF2-Zone1          OK         46 degrees C / 114 degrees F
          SFB 3 SFB-XF1-Zone0          OK         46 degrees C / 114 degrees F
          SFB 3 SFB-XF0-Zone0          OK         57 degrees C / 134 degrees F
          SFB 4 Intake-Zone0           OK         36 degrees C / 96 degrees F
          SFB 4 Exhaust-Zone1          OK         32 degrees C / 89 degrees F
          SFB 4 IntakeA-Zone0          OK         31 degrees C / 87 degrees F
          SFB 4 IntakeB-Zone1          OK         26 degrees C / 78 degrees F
          SFB 4 Exhaust-Zone0          OK         32 degrees C / 89 degrees F
          SFB 4 SFB-XF2-Zone1          OK         44 degrees C / 111 degrees F
          SFB 4 SFB-XF1-Zone0          OK         45 degrees C / 113 degrees F
          SFB 4 SFB-XF0-Zone0          OK         52 degrees C / 125 degrees F
          SFB 5 Intake-Zone0           OK         31 degrees C / 87 degrees F
          SFB 5 Exhaust-Zone1          OK         30 degrees C / 86 degrees F
          SFB 5 IntakeA-Zone0          OK         26 degrees C / 78 degrees F
          SFB 5 IntakeB-Zone1          OK         24 degrees C / 75 degrees F
          SFB 5 Exhaust-Zone0          OK         29 degrees C / 84 degrees F
          SFB 5 SFB-XF2-Zone1          OK         43 degrees C / 109 degrees F
          SFB 5 SFB-XF1-Zone0          OK         47 degrees C / 116 degrees F
          SFB 5 SFB-XF0-Zone0          OK         49 degrees C / 120 degrees F
          SFB 6 Intake-Zone0           OK         30 degrees C / 86 degrees F
          SFB 6 Exhaust-Zone1          OK         29 degrees C / 84 degrees F
          SFB 6 IntakeA-Zone0          OK         25 degrees C / 77 degrees F
          SFB 6 IntakeB-Zone1          OK         24 degrees C / 75 degrees F
          SFB 6 Exhaust-Zone0          OK         29 degrees C / 84 degrees F
          SFB 6 SFB-XF2-Zone1          OK         43 degrees C / 109 degrees F
          SFB 6 SFB-XF1-Zone0          OK         44 degrees C / 111 degrees F
          SFB 6 SFB-XF0-Zone0          OK         45 degrees C / 113 degrees F
          SFB 7 Intake-Zone0           OK         31 degrees C / 87 degrees F
          SFB 7 Exhaust-Zone1          OK         30 degrees C / 86 degrees F
          SFB 7 IntakeA-Zone0          OK         26 degrees C / 78 degrees F
          SFB 7 IntakeB-Zone1          OK         24 degrees C / 75 degrees F
          SFB 7 Exhaust-Zone0          OK         28 degrees C / 82 degrees F
          SFB 7 SFB-XF2-Zone1          OK         50 degrees C / 122 degrees F
          SFB 7 SFB-XF1-Zone0          OK         43 degrees C / 109 degrees F
          SFB 7 SFB-XF0-Zone0          OK         47 degrees C / 116 degrees F
          FPC 0 Intake                 OK         31 degrees C / 87 degrees F
          FPC 0 Exhaust A              OK         49 degrees C / 120 degrees F
          FPC 0 Exhaust B              OK         43 degrees C / 109 degrees F
          FPC 0 XL TSen                OK         42 degrees C / 107 degrees F
          FPC 0 XL Chip                OK         46 degrees C / 114 degrees F
          FPC 0 XL_XR0 TSen            OK         42 degrees C / 107 degrees F
          FPC 0 XL_XR0 Chip            OK         48 degrees C / 118 degrees F
     FPC 0 XL_XR1 TSen            OK         42 degrees C / 107 degrees F
          FPC 0 XL_XR1 Chip            OK         48 degrees C / 118 degrees F
          FPC 0 XQ TSen                OK         42 degrees C / 107 degrees F
          FPC 0 XQ Chip                OK         44 degrees C / 111 degrees F
          FPC 0 XQ_XR0 TSen            OK         42 degrees C / 107 degrees F
          FPC 0 XQ_XR0 Chip            OK         57 degrees C / 134 degrees F
          FPC 0 XQ_XR1 TSen            OK         42 degrees C / 107 degrees F
          FPC 0 XQ_XR1 Chip            OK         55 degrees C / 131 degrees F
          FPC 0 XM 0 TSen              OK         48 degrees C / 118 degrees F
          FPC 0 XM 0 Chip              OK         62 degrees C / 143 degrees F
          FPC 0 XM 1 TSen              OK         48 degrees C / 118 degrees F
          FPC 0 XM 1 Chip              OK         44 degrees C / 111 degrees F
          FPC 0 PLX PCIe Switch TSe    OK         48 degrees C / 118 degrees F
          FPC 0 PLX PCIe Switch Chi    OK         57 degrees C / 134 degrees F
          FPC 1 Intake                 OK         29 degrees C / 84 degrees F
          FPC 1 Exhaust A              OK         36 degrees C / 96 degrees F
          FPC 1 Exhaust B              OK         44 degrees C / 111 degrees F
```

```
    FPC 1 LU 0 TSen                OK        38 degrees C / 100 degrees F
    FPC 1 LU 0 Chip                OK        45 degrees C / 113 degrees F
    FPC 1 LU 1 TSen                OK        38 degrees C / 100 degrees F
    FPC 1 LU 1 Chip                OK        38 degrees C / 100 degrees F
    FPC 1 LU 2 TSen                OK        38 degrees C / 100 degrees F
    FPC 1 LU 2 Chip                OK        42 degrees C / 107 degrees F
    FPC 1 LU 3 TSen                OK        38 degrees C / 100 degrees F
    FPC 1 LU 3 Chip                OK        47 degrees C / 116 degrees F
    FPC 1 XM 0 TSen                OK        38 degrees C / 100 degrees F
    FPC 1 XM 0 Chip                OK        44 degrees C / 111 degrees F
    FPC 1 XF 0 TSen                OK        38 degrees C / 100 degrees F
    FPC 1 XF 0 Chip                OK        54 degrees C / 129 degrees F
    FPC 1 PLX Switch TSen          OK        38 degrees C / 100 degrees F
    FPC 1 PLX Switch Chip          OK        41 degrees C / 105 degrees F
    FPC 2 Intake                   OK        28 degrees C / 82 degrees F
    FPC 2 Exhaust A                OK        28 degrees C / 82 degrees F
    FPC 2 Exhaust B                OK        28 degrees C / 82 degrees F
    FPC 2 LU 0 TSen                OK        40 degrees C / 104 degrees F
    FPC 2 LU 0 Chip                OK        40 degrees C / 104 degrees F
    FPC 2 LU 1 TSen                OK        40 degrees C / 104 degrees F
    FPC 2 LU 1 Chip                OK        41 degrees C / 105 degrees F
    FPC 2 LU 2 TSen                OK        40 degrees C / 104 degrees F
    FPC 2 LU 2 Chip                OK        34 degrees C / 93 degrees F
    FPC 2 LU 3 TSen                OK        40 degrees C / 104 degrees F
    FPC 2 LU 3 Chip                OK        38 degrees C / 100 degrees F
    FPC 2 XM 0 TSen                OK        40 degrees C / 104 degrees F
    FPC 2 XM 0 Chip                OK        47 degrees C / 116 degrees F
    FPC 2 XM 1 TSen                OK        40 degrees C / 104 degrees F
    FPC 2 XM 1 Chip                OK        42 degrees C / 107 degrees F
    FPC 2 PLX Switch TSen          OK        40 degrees C / 104 degrees F
    FPC 2 PLX Switch Chip          OK        39 degrees C / 102 degrees F
    FPC 3 Intake                   OK        27 degrees C / 80 degrees F
    FPC 3 Exhaust A                OK        38 degrees C / 100 degrees F
    FPC 3 Exhaust B                OK        31 degrees C / 87 degrees F
    FPC 3 QX 0 TSen                OK        38 degrees C / 100 degrees F
    FPC 3 QX 0 Chip                OK        42 degrees C / 107 degrees F
    FPC 3 LU 0 TCAM TSen           OK        38 degrees C / 100 degrees F
    FPC 3 LU 0 TCAM Chip           OK        43 degrees C / 109 degrees F
    FPC 3 LU 0 TSen                OK        38 degrees C / 100 degrees F
FPC 3 LU 0 Chip                OK        42 degrees C / 107 degrees F
    FPC 3 MQ 0 TSen                OK        38 degrees C / 100 degrees F
    FPC 3 MQ 0 Chip                OK        39 degrees C / 102 degrees F
    FPC 3 QX 1 TSen                OK        32 degrees C / 89 degrees F
    FPC 3 QX 1 Chip                OK        36 degrees C / 96 degrees F
    FPC 3 LU 1 TCAM TSen           OK        32 degrees C / 89 degrees F
    FPC 3 LU 1 TCAM Chip           OK        35 degrees C / 95 degrees F
    FPC 3 LU 1 TSen                OK        32 degrees C / 89 degrees F
    FPC 3 LU 1 Chip                OK        37 degrees C / 98 degrees F
    FPC 3 MQ 1 TSen                OK        32 degrees C / 89 degrees F
    FPC 3 MQ 1 Chip                OK        36 degrees C / 96 degrees F
    FPC 4 Intake                   OK        29 degrees C / 84 degrees F
    FPC 4 Exhaust A                OK        36 degrees C / 96 degrees F
    FPC 4 Exhaust B                OK        40 degrees C / 104 degrees F
    FPC 4 XL TSen                  OK        39 degrees C / 102 degrees F
    FPC 4 XL Chip                  OK        42 degrees C / 107 degrees F
    FPC 4 XL_XR0 TSen              OK        39 degrees C / 102 degrees F
    FPC 4 XL_XR0 Chip              OK        45 degrees C / 113 degrees F
    FPC 4 XL_XR1 TSen              OK        39 degrees C / 102 degrees F
    FPC 4 XL_XR1 Chip              OK        46 degrees C / 114 degrees F
    FPC 4 XQ TSen                  OK        39 degrees C / 102 degrees F
    FPC 4 XQ Chip                  OK        42 degrees C / 107 degrees F
```



```
        FPC 4 XQ_XR0 TSen              OK          39 degrees C / 102 degrees F
        FPC 4 XQ_XR0 Chip              OK          54 degrees C / 129 degrees F
        FPC 4 XQ_XR1 TSen              OK          39 degrees C / 102 degrees F
        FPC 4 XQ_XR1 Chip              OK          53 degrees C / 127 degrees F
        FPC 4 XM 0 TSen                OK          45 degrees C / 113 degrees F
        FPC 4 XM 0 Chip                OK          59 degrees C / 138 degrees F
        FPC 4 XM 1 TSen                OK          45 degrees C / 113 degrees F
        FPC 4 XM 1 Chip                OK          41 degrees C / 105 degrees F
        FPC 4 PLX PCIe Switch TSe      OK          45 degrees C / 113 degrees F
        FPC 4 PLX PCIe Switch Chi      OK          58 degrees C / 136 degrees F
        FPC 5 Intake                   OK          29 degrees C / 84 degrees F
        FPC 5 Exhaust A                OK          33 degrees C / 91 degrees F
        FPC 5 Exhaust B                OK          39 degrees C / 102 degrees F
        FPC 5 LU 0 TSen                OK          40 degrees C / 104 degrees F
        FPC 5 LU 0 Chip                OK          40 degrees C / 104 degrees F
        FPC 5 LU 1 TSen                OK          40 degrees C / 104 degrees F
        FPC 5 LU 1 Chip                OK          45 degrees C / 113 degrees F
        FPC 5 LU 2 TSen                OK          40 degrees C / 104 degrees F
        FPC 5 LU 2 Chip                OK          40 degrees C / 104 degrees F
        FPC 5 LU 3 TSen                OK          40 degrees C / 104 degrees F
        FPC 5 LU 3 Chip                OK          46 degrees C / 114 degrees F
        FPC 5 MQ 0 TSen                OK          32 degrees C / 89 degrees F
        FPC 5 MQ 0 Chip                OK          33 degrees C / 91 degrees F
        FPC 5 MQ 1 TSen                OK          32 degrees C / 89 degrees F
        FPC 5 MQ 1 Chip                OK          35 degrees C / 95 degrees F
        FPC 5 MQ 2 TSen                OK          32 degrees C / 89 degrees F
        FPC 5 MQ 2 Chip                OK          32 degrees C / 89 degrees F
        FPC 5 MQ 3 TSen                OK          32 degrees C / 89 degrees F
        FPC 5 MQ 3 Chip                OK          32 degrees C / 89 degrees F
        FPC 9 Intake                   OK          25 degrees C / 77 degrees F
        FPC 9 Exhaust A                OK          37 degrees C / 98 degrees F
        FPC 9 Exhaust B                OK          40 degrees C / 104 degrees F
        FPC 9 XL 0 TSen                OK          40 degrees C / 104 degrees F
...
```

show chassis environment (MX2010 Router)

```
user@host> show chassis environment
Class Item                           Status      Measurement
Temp  PSM 0                          OK          7 degrees C / 44 degrees F
      PSM 1                          OK          7 degrees C / 44 degrees F
      PSM 2                          OK          7 degrees C / 44 degrees F
      PSM 3                          OK          6 degrees C / 42 degrees F
      PSM 4                          OK          6 degrees C / 42 degrees F
      PSM 5                          OK          6 degrees C / 42 degrees F
      PSM 6                          OK          6 degrees C / 42 degrees F
      PSM 7                          OK          7 degrees C / 44 degrees F
      PSM 8                          OK          7 degrees C / 44 degrees F
      PDM 0                          OK
      PDM 1                          Absent
      CB 0 IntakeA-Zone0             OK          14 degrees C / 57 degrees F
      CB 0 IntakeB-Zone1             OK          7 degrees C / 44 degrees F
      CB 0 IntakeC-Zone0             OK          22 degrees C / 71 degrees F
      CB 0 ExhaustA-Zone0            OK          14 degrees C / 57 degrees F
      CB 0 ExhaustB-Zone1            OK          9 degrees C / 48 degrees F
      CB 0 TCBC-Zone0                OK          11 degrees C / 51 degrees F
      CB 1 IntakeA-Zone0             OK          9 degrees C / 48 degrees F
      CB 1 IntakeB-Zone1             OK          5 degrees C / 41 degrees F
      CB 1 IntakeC-Zone0             OK          20 degrees C / 68 degrees F
      CB 1 ExhaustA-Zone0            OK          12 degrees C / 53 degrees F
      CB 1 ExhaustB-Zone1            OK          7 degrees C / 44 degrees F
```

```
CB 1 TCBC-Zone0            OK         10 degrees C / 50 degrees F
SPMB 0 Intake              OK         5 degrees C / 41 degrees F
SPMB 1 Intake              OK         4 degrees C / 39 degrees F
Routing Engine 0           OK         9 degrees C / 48 degrees F
Routing Engine 0 CPU       OK         9 degrees C / 48 degrees F
Routing Engine 1           OK         6 degrees C / 42 degrees F
Routing Engine 1 CPU       OK         6 degrees C / 42 degrees F
SFB 0 Intake-Zone0         OK         26 degrees C / 78 degrees F
SFB 0 Exhaust-Zone1        OK         17 degrees C / 62 degrees F
SFB 0 IntakeA-Zone0        OK         16 degrees C / 60 degrees F
SFB 0 IntakeB-Zone1        OK         11 degrees C / 51 degrees F
SFB 0 Exhaust-Zone0        OK         18 degrees C / 64 degrees F
SFB 0 SFB-XF2-Zone1        OK         25 degrees C / 77 degrees F
SFB 0 SFB-XF1-Zone0        OK         23 degrees C / 73 degrees F
SFB 0 SFB-XF0-Zone0        OK         33 degrees C / 91 degrees F
SFB 1 Intake-Zone0         OK         27 degrees C / 80 degrees F
SFB 1 Exhaust-Zone1        OK         15 degrees C / 59 degrees F
SFB 1 IntakeA-Zone0        OK         20 degrees C / 68 degrees F
SFB 1 IntakeB-Zone1        OK         10 degrees C / 50 degrees F
SFB 1 Exhaust-Zone0        OK         19 degrees C / 66 degrees F
SFB 1 SFB-XF2-Zone1        OK         26 degrees C / 78 degrees F
SFB 1 SFB-XF1-Zone0        OK         27 degrees C / 80 degrees F
SFB 1 SFB-XF0-Zone0        OK         32 degrees C / 89 degrees F
SFB 2 Intake-Zone0         OK         21 degrees C / 69 degrees F
SFB 2 Exhaust-Zone1        OK         13 degrees C / 55 degrees F
SFB 2 IntakeA-Zone0        OK         18 degrees C / 64 degrees F
SFB 2 IntakeB-Zone1        OK         9 degrees C / 48 degrees F
SFB 2 Exhaust-Zone0        OK         16 degrees C / 60 degrees F
SFB 2 SFB-XF2-Zone1        OK         24 degrees C / 75 degrees F
SFB 2 SFB-XF1-Zone0        OK         21 degrees C / 69 degrees F
SFB 2 SFB-XF0-Zone0        OK         26 degrees C / 78 degrees F
SFB 4 Intake-Zone0         OK         28 degrees C / 82 degrees F
SFB 4 Exhaust-Zone1        OK         16 degrees C / 60 degrees F
SFB 4 IntakeA-Zone0        OK         18 degrees C / 64 degrees F
SFB 4 IntakeB-Zone1        OK         11 degrees C / 51 degrees F
SFB 4 Exhaust-Zone0        OK         19 degrees C / 66 degrees F
SFB 4 SFB-XF2-Zone1        OK         27 degrees C / 80 degrees F
SFB 4 SFB-XF1-Zone0        OK         27 degrees C / 80 degrees F
SFB 4 SFB-XF0-Zone0        OK         32 degrees C / 89 degrees F
SFB 5 Intake-Zone0         OK         22 degrees C / 71 degrees F
SFB 5 Exhaust-Zone1        OK         14 degrees C / 57 degrees F
SFB 5 IntakeA-Zone0        OK         18 degrees C / 64 degrees F
SFB 5 IntakeB-Zone1        OK         10 degrees C / 50 degrees F
SFB 5 Exhaust-Zone0        OK         17 degrees C / 62 degrees F
SFB 5 SFB-XF2-Zone1        OK         22 degrees C / 71 degrees F
SFB 5 SFB-XF1-Zone0        OK         29 degrees C / 84 degrees F
SFB 5 SFB-XF0-Zone0        OK         27 degrees C / 80 degrees F
SFB 6 Intake-Zone0         OK         27 degrees C / 80 degrees F
SFB 6 Exhaust-Zone1        OK         13 degrees C / 55 degrees F
SFB 6 IntakeA-Zone0        OK         19 degrees C / 66 degrees F
SFB 6 IntakeB-Zone1        OK         10 degrees C / 50 degrees F
SFB 6 Exhaust-Zone0        OK         20 degrees C / 68 degrees F
SFB 6 SFB-XF2-Zone1        OK         24 degrees C / 75 degrees F
SFB 6 SFB-XF1-Zone0        OK         32 degrees C / 89 degrees F
SFB 6 SFB-XF0-Zone0        OK         33 degrees C / 91 degrees F
SFB 7 Intake-Zone0         OK         25 degrees C / 77 degrees F
SFB 7 Exhaust-Zone1        OK         13 degrees C / 55 degrees F
SFB 7 IntakeA-Zone0        OK         14 degrees C / 57 degrees F
SFB 7 IntakeB-Zone1        OK         8 degrees C / 46 degrees F
SFB 7 Exhaust-Zone0        OK         17 degrees C / 62 degrees F
SFB 7 SFB-XF2-Zone1        OK         21 degrees C / 69 degrees F
```



```
          SFB 7 SFB-XF1-Zone0           OK         21 degrees C / 69 degrees F
          SFB 7 SFB-XF0-Zone0           OK         33 degrees C / 91 degrees F
          FPC 0 Intake                  OK         13 degrees C / 55 degrees F
          FPC 0 Exhaust A               OK         13 degrees C / 55 degrees F
          FPC 0 Exhaust B               OK         14 degrees C / 57 degrees F
          FPC 0 LU 0 TSen               OK         28 degrees C / 82 degrees F
          FPC 0 LU 0 Chip               OK         25 degrees C / 77 degrees F
          FPC 0 LU 1 TSen               OK         28 degrees C / 82 degrees F
          FPC 0 LU 1 Chip               OK         27 degrees C / 80 degrees F
          FPC 0 LU 2 TSen               OK         28 degrees C / 82 degrees F
          FPC 0 LU 2 Chip               OK         19 degrees C / 66 degrees F
          FPC 0 LU 3 TSen               OK         28 degrees C / 82 degrees F
          FPC 0 LU 3 Chip               OK         23 degrees C / 73 degrees F
          FPC 0 XM 0 TSen               OK         28 degrees C / 82 degrees F
          FPC 0 XM 0 Chip               OK         33 degrees C / 91 degrees F
          FPC 0 XM 1 TSen               OK         28 degrees C / 82 degrees F
          FPC 0 XM 1 Chip               OK         26 degrees C / 78 degrees F
          FPC 0 PLX Switch TSen         OK         28 degrees C / 82 degrees F
          FPC 0 PLX Switch Chip         OK         26 degrees C / 78 degrees F
          FPC 1 Intake                  OK         10 degrees C / 50 degrees F
          FPC 1 Exhaust A               OK         24 degrees C / 75 degrees F
          FPC 1 Exhaust B               OK         28 degrees C / 82 degrees F
          FPC 1 LU 0 TSen               OK         22 degrees C / 71 degrees F
          FPC 1 LU 0 Chip               OK         31 degrees C / 87 degrees F
          FPC 1 LU 1 TSen               OK         22 degrees C / 71 degrees F
          FPC 1 LU 1 Chip               OK         21 degrees C / 69 degrees F
          FPC 1 LU 2 TSen               OK         22 degrees C / 71 degrees F
          FPC 1 LU 2 Chip               OK         25 degrees C / 77 degrees F
          FPC 1 LU 3 TSen               OK         22 degrees C / 71 degrees F
          FPC 1 LU 3 Chip               OK         33 degrees C / 91 degrees F
          FPC 1 XM 0 TSen               OK         22 degrees C / 71 degrees F
          FPC 1 XM 0 Chip               OK         30 degrees C / 86 degrees F
          FPC 1 XF 0 TSen               OK         22 degrees C / 71 degrees F
          FPC 1 XF 0 Chip               OK         37 degrees C / 98 degrees F
          FPC 1 PLX Switch TSen         OK         22 degrees C / 71 degrees F
    FPC 1 PLX Switch Chip         OK         22 degrees C / 71 degrees F
          FPC 2 Intake                  OK         9 degrees C / 48 degrees F
          FPC 2 Exhaust A               OK         10 degrees C / 50 degrees F
          FPC 2 Exhaust B               OK         10 degrees C / 50 degrees F
          FPC 2 LU 0 TSen               OK         26 degrees C / 78 degrees F
          FPC 2 LU 0 Chip               OK         25 degrees C / 77 degrees F
          FPC 2 LU 1 TSen               OK         26 degrees C / 78 degrees F
          FPC 2 LU 1 Chip               OK         26 degrees C / 78 degrees F
          FPC 2 LU 2 TSen               OK         26 degrees C / 78 degrees F
          FPC 2 LU 2 Chip               OK         17 degrees C / 62 degrees F
          FPC 2 LU 3 TSen               OK         26 degrees C / 78 degrees F
          FPC 2 LU 3 Chip               OK         22 degrees C / 71 degrees F
          FPC 2 XM 0 TSen               OK         26 degrees C / 78 degrees F
          FPC 2 XM 0 Chip               OK         34 degrees C / 93 degrees F
          FPC 2 XM 1 TSen               OK         26 degrees C / 78 degrees F
          FPC 2 XM 1 Chip               OK         26 degrees C / 78 degrees F
          FPC 2 PLX Switch TSen         OK         26 degrees C / 78 degrees F
          FPC 2 PLX Switch Chip         OK         20 degrees C / 68 degrees F
          FPC 3 Intake                  OK         12 degrees C / 53 degrees F
          FPC 3 Exhaust A               OK         16 degrees C / 60 degrees F
          FPC 3 Exhaust B               OK         26 degrees C / 78 degrees F
          FPC 3 LU 0 TSen               OK         23 degrees C / 73 degrees F
          FPC 3 LU 0 Chip               OK         26 degrees C / 78 degrees F
          FPC 3 LU 1 TSen               OK         23 degrees C / 73 degrees F
          FPC 3 LU 1 Chip               OK         27 degrees C / 80 degrees F
          FPC 3 LU 2 TSen               OK         23 degrees C / 73 degrees F
```

```
    FPC 3 LU 2 Chip          OK         22 degrees C / 71 degrees F
    FPC 3 LU 3 TSen          OK         23 degrees C / 73 degrees F
    FPC 3 LU 3 Chip          OK         21 degrees C / 69 degrees F
    FPC 3 MQ 0 TSen          OK         15 degrees C / 59 degrees F
    FPC 3 MQ 0 Chip          OK         18 degrees C / 64 degrees F
    FPC 3 MQ 1 TSen          OK         15 degrees C / 59 degrees F
    FPC 3 MQ 1 Chip          OK         20 degrees C / 68 degrees F
    FPC 3 MQ 2 TSen          OK         15 degrees C / 59 degrees F
    FPC 3 MQ 2 Chip          OK         17 degrees C / 62 degrees F
    FPC 3 MQ 3 TSen          OK         15 degrees C / 59 degrees F
    FPC 3 MQ 3 Chip          OK         16 degrees C / 60 degrees F
    FPC 4 Intake             OK         11 degrees C / 51 degrees F
    FPC 4 Exhaust A          OK         22 degrees C / 71 degrees F
    FPC 4 Exhaust B          OK         28 degrees C / 82 degrees F
    FPC 4 LU 0 TSen          OK         22 degrees C / 71 degrees F
    FPC 4 LU 0 Chip          OK         33 degrees C / 91 degrees F
    FPC 4 LU 1 TSen          OK         22 degrees C / 71 degrees F
    FPC 4 LU 1 Chip          OK         21 degrees C / 69 degrees F
    FPC 4 LU 2 TSen          OK         22 degrees C / 71 degrees F
    FPC 4 LU 2 Chip          OK         26 degrees C / 78 degrees F
    FPC 4 LU 3 TSen          OK         22 degrees C / 71 degrees F
    FPC 4 LU 3 Chip          OK         33 degrees C / 91 degrees F
    FPC 4 XM 0 TSen          OK         22 degrees C / 71 degrees F
    FPC 4 XM 0 Chip          OK         30 degrees C / 86 degrees F
    FPC 4 XF 0 TSen          OK         22 degrees C / 71 degrees F
    FPC 4 XF 0 Chip          OK         37 degrees C / 98 degrees F
    FPC 4 PLX Switch TSen    OK         22 degrees C / 71 degrees F
    FPC 4 PLX Switch Chip    OK         23 degrees C / 73 degrees F
    FPC 5 Intake             OK         12 degrees C / 53 degrees F
    FPC 5 Exhaust A          OK         12 degrees C / 53 degrees F
FPC 5 Exhaust B              OK         12 degrees C / 53 degrees F
    FPC 5 LU 0 TSen          OK         27 degrees C / 80 degrees F
    FPC 5 LU 0 Chip          OK         28 degrees C / 82 degrees F
    FPC 5 LU 1 TSen          OK         27 degrees C / 80 degrees F
    FPC 5 LU 1 Chip          OK         27 degrees C / 80 degrees F
    FPC 5 LU 2 TSen          OK         27 degrees C / 80 degrees F
    FPC 5 LU 2 Chip          OK         19 degrees C / 66 degrees F
    FPC 5 LU 3 TSen          OK         27 degrees C / 80 degrees F
    FPC 5 LU 3 Chip          OK         22 degrees C / 71 degrees F
    FPC 5 XM 0 TSen          OK         27 degrees C / 80 degrees F
    FPC 5 XM 0 Chip          OK         36 degrees C / 96 degrees F
    FPC 5 XM 1 TSen          OK         27 degrees C / 80 degrees F
    FPC 5 XM 1 Chip          OK         26 degrees C / 78 degrees F
    FPC 5 PLX Switch TSen    OK         27 degrees C / 80 degrees F
    FPC 5 PLX Switch Chip    OK         24 degrees C / 75 degrees F
    FPC 6 Intake             OK         12 degrees C / 53 degrees F
    FPC 6 Exhaust A          OK         17 degrees C / 62 degrees F
    FPC 6 Exhaust B          OK         28 degrees C / 82 degrees F
    FPC 6 LU 0 TSen          OK         24 degrees C / 75 degrees F
    FPC 6 LU 0 Chip          OK         29 degrees C / 84 degrees F
    FPC 6 LU 1 TSen          OK         24 degrees C / 75 degrees F
    FPC 6 LU 1 Chip          OK         30 degrees C / 86 degrees F
    FPC 6 LU 2 TSen          OK         24 degrees C / 75 degrees F
    FPC 6 LU 2 Chip          OK         24 degrees C / 75 degrees F
    FPC 6 LU 3 TSen          OK         24 degrees C / 75 degrees F
    FPC 6 LU 3 Chip          OK         22 degrees C / 71 degrees F
    FPC 6 MQ 0 TSen          OK         16 degrees C / 60 degrees F
    FPC 6 MQ 0 Chip          OK         19 degrees C / 66 degrees F
    FPC 6 MQ 1 TSen          OK         16 degrees C / 60 degrees F
    FPC 6 MQ 1 Chip          OK         20 degrees C / 68 degrees F
    FPC 6 MQ 2 TSen          OK         16 degrees C / 60 degrees F
```

```
    FPC 6 MQ 2 Chip           OK         17 degrees C / 62 degrees F
    FPC 6 MQ 3 TSen           OK         16 degrees C / 60 degrees F
    FPC 6 MQ 3 Chip           OK         16 degrees C / 60 degrees F
    FPC 7 Intake              OK         10 degrees C / 50 degrees F
    FPC 7 Exhaust A           OK         10 degrees C / 50 degrees F
    FPC 7 Exhaust B           OK         11 degrees C / 51 degrees F
    FPC 7 LU 0 TSen           OK         26 degrees C / 78 degrees F
    FPC 7 LU 0 Chip           OK         26 degrees C / 78 degrees F
    FPC 7 LU 1 TSen           OK         26 degrees C / 78 degrees F
    FPC 7 LU 1 Chip           OK         29 degrees C / 84 degrees F
    FPC 7 LU 2 TSen           OK         26 degrees C / 78 degrees F
    FPC 7 LU 2 Chip           OK         19 degrees C / 66 degrees F
    FPC 7 LU 3 TSen           OK         26 degrees C / 78 degrees F
    FPC 7 LU 3 Chip           OK         24 degrees C / 75 degrees F
    FPC 7 XM 0 TSen           OK         26 degrees C / 78 degrees F
    FPC 7 XM 0 Chip           OK         34 degrees C / 93 degrees F
    FPC 7 XM 1 TSen           OK         26 degrees C / 78 degrees F
    FPC 7 XM 1 Chip           OK         32 degrees C / 89 degrees F
    FPC 7 PLX Switch TSen     OK         26 degrees C / 78 degrees F
    FPC 7 PLX Switch Chip     OK         22 degrees C / 71 degrees F
    FPC 8 Intake              OK         10 degrees C / 50 degrees F
    FPC 8 Exhaust A           OK         22 degrees C / 71 degrees F
    FPC 8 Exhaust B           OK         28 degrees C / 82 degrees F
    FPC 8 LU 0 TSen           OK         20 degrees C / 68 degrees F
    FPC 8 LU 0 Chip           OK         33 degrees C / 91 degrees F
FPC 8 LU 1 TSen           OK         20 degrees C / 68 degrees F
    FPC 8 LU 1 Chip           OK         23 degrees C / 73 degrees F
    FPC 8 LU 2 TSen           OK         20 degrees C / 68 degrees F
    FPC 8 LU 2 Chip           OK         26 degrees C / 78 degrees F
    FPC 8 LU 3 TSen           OK         20 degrees C / 68 degrees F
    FPC 8 LU 3 Chip           OK         33 degrees C / 91 degrees F
    FPC 8 XM 0 TSen           OK         20 degrees C / 68 degrees F
    FPC 8 XM 0 Chip           OK         29 degrees C / 84 degrees F
    FPC 8 XF 0 TSen           OK         20 degrees C / 68 degrees F
    FPC 8 XF 0 Chip           OK         38 degrees C / 100 degrees F
    FPC 8 PLX Switch TSen     OK         20 degrees C / 68 degrees F
    FPC 8 PLX Switch Chip     OK         24 degrees C / 75 degrees F
    FPC 9 Intake              OK         11 degrees C / 51 degrees F
    FPC 9 Exhaust A           OK         11 degrees C / 51 degrees F
    FPC 9 Exhaust B           OK         11 degrees C / 51 degrees F
    FPC 9 LU 0 TSen           OK         25 degrees C / 77 degrees F
    FPC 9 LU 0 Chip           OK         24 degrees C / 75 degrees F
    FPC 9 LU 1 TSen           OK         25 degrees C / 77 degrees F
    FPC 9 LU 1 Chip           OK         26 degrees C / 78 degrees F
    FPC 9 LU 2 TSen           OK         25 degrees C / 77 degrees F
    FPC 9 LU 2 Chip           OK         16 degrees C / 60 degrees F
    FPC 9 LU 3 TSen           OK         25 degrees C / 77 degrees F
    FPC 9 LU 3 Chip           OK         21 degrees C / 69 degrees F
    FPC 9 XM 0 TSen           OK         25 degrees C / 77 degrees F
    FPC 9 XM 0 Chip           OK         32 degrees C / 89 degrees F
    FPC 9 XM 1 TSen           OK         25 degrees C / 77 degrees F
    FPC 9 XM 1 Chip           OK         25 degrees C / 77 degrees F
    FPC 9 PLX Switch TSen     OK         25 degrees C / 77 degrees F
    FPC 9 PLX Switch Chip     OK         21 degrees C / 69 degrees F
    ADC 0 Intake              OK         12 degrees C / 53 degrees F
    ADC 0 Exhaust             OK         20 degrees C / 68 degrees F
    ADC 0 ADC-XF1             OK         26 degrees C / 78 degrees F
    ADC 0 ADC-XF0             OK         32 degrees C / 89 degrees F
    ADC 1 Intake              OK         11 degrees C / 51 degrees F
    ADC 1 Exhaust             OK         21 degrees C / 69 degrees F
    ADC 1 ADC-XF1             OK         24 degrees C / 75 degrees F
```

```
          ADC 1 ADC-XF0                 OK          31 degrees C / 87 degrees F
          ADC 2 Intake                  OK          14 degrees C / 57 degrees F
          ADC 2 Exhaust                 OK          21 degrees C / 69 degrees F
          ADC 2 ADC-XF1                 OK          28 degrees C / 82 degrees F
          ADC 2 ADC-XF0                 OK          34 degrees C / 93 degrees F
          ADC 3 Intake                  OK          13 degrees C / 55 degrees F
          ADC 3 Exhaust                 OK          19 degrees C / 66 degrees F
          ADC 3 ADC-XF1                 OK          24 degrees C / 75 degrees F
          ADC 3 ADC-XF0                 OK          31 degrees C / 87 degrees F
          ADC 4 Intake                  OK          9 degrees C / 48 degrees F
          ADC 4 Exhaust                 OK          22 degrees C / 71 degrees F
          ADC 4 ADC-XF1                 OK          28 degrees C / 82 degrees F
          ADC 4 ADC-XF0                 OK          35 degrees C / 95 degrees F
          ADC 5 Intake                  OK          12 degrees C / 53 degrees F
          ADC 5 Exhaust                 OK          22 degrees C / 71 degrees F
          ADC 5 ADC-XF1                 OK          28 degrees C / 82 degrees F
          ADC 5 ADC-XF0                 OK          34 degrees C / 93 degrees F
          ADC 6 Intake                  OK          11 degrees C / 51 degrees F
          ADC 6 Exhaust                 OK          21 degrees C / 69 degrees F
          ADC 6 ADC-XF1                 OK          26 degrees C / 78 degrees F
     ADC 6 ADC-XF0                 OK          35 degrees C / 95 degrees F
          ADC 7 Intake                  OK          14 degrees C / 57 degrees F
          ADC 7 Exhaust                 OK          22 degrees C / 71 degrees F
          ADC 7 ADC-XF1                 OK          26 degrees C / 78 degrees F
          ADC 7 ADC-XF0                 OK          34 degrees C / 93 degrees F
          ADC 8 Intake                  OK          14 degrees C / 57 degrees F
          ADC 8 Exhaust                 OK          21 degrees C / 69 degrees F
          ADC 8 ADC-XF1                 OK          24 degrees C / 75 degrees F
          ADC 8 ADC-XF0                 OK          31 degrees C / 87 degrees F
          ADC 9 Intake                  OK          10 degrees C / 50 degrees F
          ADC 9 Exhaust                 OK          22 degrees C / 71 degrees F
          ADC 9 ADC-XF1                 OK          28 degrees C / 82 degrees F
          ADC 9 ADC-XF0                 OK          36 degrees C / 96 degrees F
    Fans  Fan Tray 0 Fan 1              OK          3480 RPM
          Fan Tray 0 Fan 2              OK          3480 RPM
          Fan Tray 0 Fan 3              OK          3480 RPM
          Fan Tray 0 Fan 4              OK          3360 RPM
          Fan Tray 0 Fan 5              OK          3360 RPM
          Fan Tray 0 Fan 6              OK          3480 RPM
          Fan Tray 1 Fan 1              OK          3360 RPM
          Fan Tray 1 Fan 2              OK          3360 RPM
          Fan Tray 1 Fan 3              OK          3360 RPM
          Fan Tray 1 Fan 4              OK          3480 RPM
          Fan Tray 1 Fan 5              OK          3480 RPM
          Fan Tray 1 Fan 6              OK          3480 RPM
          Fan Tray 2 Fan 1              OK          3360 RPM
          Fan Tray 2 Fan 2              OK          3360 RPM
          Fan Tray 2 Fan 3              OK          3480 RPM
          Fan Tray 2 Fan 4              OK          3480 RPM
          Fan Tray 2 Fan 5              OK          3360 RPM
          Fan Tray 2 Fan 6              OK          3480 RPM
          Fan Tray 3 Fan 1              OK          3360 RPM
          Fan Tray 3 Fan 2              OK          3360 RPM
          Fan Tray 3 Fan 3              OK          3480 RPM
          Fan Tray 3 Fan 4              OK          3480 RPM
          Fan Tray 3 Fan 5              OK          3480 RPM
          Fan Tray 3 Fan 6              OK          3360 RPM
```

show chassis environment (T320 Router)

`user@host>` **show chassis environment**


```
Class Item                   Status     Measurement
Power PEM 0                  OK
      PEM 1                  Absent
Temp  SCG 0                  OK         28 degrees C / 82 degrees F
      SCG 1                  OK         28 degrees C / 82 degrees F
      Routing Engine 0       OK         31 degrees C / 87 degrees F
      Routing Engine 1       OK         30 degrees C / 86 degrees F
      CB 0                   OK         32 degrees C / 89 degrees F
      CB 1                   OK         32 degrees C / 89 degrees F
      SIB 0                  OK         33 degrees C / 91 degrees F
      SIB 1                  OK         33 degrees C / 91 degrees F
      SIB 2                  OK         34 degrees C / 93 degrees F
      FPC 0 Top              OK         38 degrees C / 100 degrees F
      FPC 0 Bottom           OK         32 degrees C / 89 degrees F
      FPC 1 Top              OK         38 degrees C / 100 degrees F
      FPC 1 Bottom           OK         33 degrees C / 91 degrees F
      FPC 2 Top              OK         36 degrees C / 96 degrees F
      FPC 2 Bottom           OK         31 degrees C / 87 degrees F
      FPM GBUS               OK         26 degrees C / 78 degrees F
      FPM Display            OK         29 degrees C / 84 degrees F
Fans  Top Left Front fan     OK         Spinning at normal speed
      Top Left Middle fan    OK         Spinning at normal speed
      Top Left Rear fan      OK         Spinning at normal speed
      Top Right Front fan    OK         Spinning at normal speed
      Top Right Middle fan   OK         Spinning at normal speed
      Top Right Rear fan     OK         Spinning at normal speed
      Bottom Left Front fan  OK         Spinning at normal speed
      Bottom Left Middle fan OK         Spinning at normal speed
      Bottom Left Rear fan   OK         Spinning at normal speed
      Bottom Right Front fan OK         Spinning at normal speed
      Bottom Right Middle fan OK        Spinning at normal speed
      Bottom Right Rear fan  OK         Spinning at normal speed
      Rear Tray Top fan      OK         Spinning at normal speed
      Rear Tray Second fan   OK         Spinning at normal speed
      Rear Tray Middle fan   OK         Spinning at normal speed
      Rear Tray Fourth fan   OK         Spinning at normal speed
      Rear Tray Bottom fan   OK         Spinning at normal speed
Misc  CIP                    OK
      SPMB 0                 OK
      SPMB 1                 OK
```

show chassis environment (T640 Router)

```
user@host> show chassis environment
Class Item                   Status     Measurement
Temp  PEM 0                  Absent
      PEM 1                  OK         22 degrees C / 71 degrees F
      SCG 0                  OK         30 degrees C / 86 degrees F
      SCG 1                  OK         30 degrees C / 86 degrees F
      Routing Engine 0       Present
      Routing Engine 1       OK         27 degrees C / 80 degrees F
      CB 0                   Present
      CB 1                   OK         33 degrees C / 91 degrees F
      SIB 0                  Absent
      SIB 1                  Absent
      SIB 2                  Absent
      SIB 3                  Absent
      SIB 4                  Absent
      FPC 4 Top              Testing
      FPC 4 Bottom           Testing
```



```
        FPC 5 Top              Testing
        FPC 5 Bottom           Testing
        FPC 6 Top              Testing
        FPC 6 Bottom           Testing
        FPM GBUS               OK          23 degrees C / 73 degrees F
        FPM Display            Absent
Fans    Top Left Front fan     OK          Spinning at normal speed
        Top Left Middle fan    OK          Spinning at normal speed
        Top Left Rear fan      OK          Spinning at normal speed
        Top Right Front fan    OK          Spinning at normal speed
        Top Right Middle fan   OK          Spinning at normal speed
        Top Right Rear fan     OK          Spinning at normal speed
        Bottom Left Front fan  OK          Spinning at normal speed
        Bottom Left Middle fan OK          Spinning at normal speed
        Bottom Left Rear fan   OK          Spinning at normal speed
        Bottom Right Front fan OK          Spinning at normal speed
        Bottom Right Middle fan OK         Spinning at normal speed
        Bottom Right Rear fan  OK          Spinning at normal speed
        Fourth Blower from top OK          Spinning at normal speed
        Bottom Blower          OK          Spinning at normal speed
        Middle Blower          OK          Spinning at normal speed
        Top Blower             OK          Spinning at normal speed
        Second Blower from top OK          Spinning at normal speed
Misc    CIP                    OK
        SPMB 0                 OK
        SPMB 1                 OK
```

show chassis environment (T4000 Router)

```
user@host> show chassis environment
Class Item                          Status     Measurement
Temp  PEM 0                         OK         33 degrees C / 91 degrees F
      PEM 1                         Absent
      SCG 0                         OK         33 degrees C / 91 degrees F
      SCG 1                         OK         33 degrees C / 91 degrees F
      Routing Engine 0              OK         33 degrees C / 91 degrees F
      Routing Engine 0 CPU          OK         50 degrees C / 122 degrees F
      Routing Engine 1              OK         32 degrees C / 89 degrees F
      Routing Engine 1 CPU          OK         46 degrees C / 114 degrees F
      CB 0                          OK         32 degrees C / 89 degrees F
      CB 1                          OK         33 degrees C / 91 degrees F
      SIB 0                         OK         42 degrees C / 107 degrees F
      SIB 1                         OK         42 degrees C / 107 degrees F
      SIB 2                         OK         42 degrees C / 107 degrees F
      SIB 3                         OK         43 degrees C / 109 degrees F
      SIB 4                         OK         45 degrees C / 113 degrees F
      FPC 0 Fan Intake              OK         34 degrees C / 93 degrees F
      FPC 0 Fan Exhaust             OK         48 degrees C / 118 degrees F
      FPC 0 PMB                     OK         47 degrees C / 116 degrees F
      FPC 0 LMB0                    OK         50 degrees C / 122 degrees F
      FPC 0 LMB1                    OK         41 degrees C / 105 degrees F
      FPC 0 LMB2                    OK         35 degrees C / 95 degrees F
      FPC 0 PFE1 LU2                OK         46 degrees C / 114 degrees F
      FPC 0 PFE1 LU0                OK         41 degrees C / 105 degrees F
      FPC 0 PFE0 LU0                OK         57 degrees C / 134 degrees F
      FPC 0 XF1                     OK         46 degrees C / 114 degrees F
      FPC 0 XF0                     OK         52 degrees C / 125 degrees F
      FPC 0 XM1                     OK         41 degrees C / 105 degrees F
      FPC 0 XM0                     OK         50 degrees C / 122 degrees F
      FPC 0 PFE0 LU1                OK         56 degrees C / 132 degrees F
```



```
      FPC 0 PFE0 LU2              OK          45 degrees C / 113 degrees F
      FPC 0 PFE1 LU1              OK          37 degrees C / 98 degrees F
      FPC 3 Fan Intake            OK          36 degrees C / 96 degrees F
      FPC 3 Fan Exhaust           OK          51 degrees C / 123 degrees F
      FPC 3 PMB                   OK          43 degrees C / 109 degrees F
      FPC 3 LMB0                  OK          57 degrees C / 134 degrees F
      FPC 3 LMB1                  OK          54 degrees C / 129 degrees F
      FPC 3 LMB2                  OK          38 degrees C / 100 degrees F
      FPC 3 PFE1 LU2              OK          63 degrees C / 145 degrees F
      FPC 3 PFE1 LU0              OK          45 degrees C / 113 degrees F
      FPC 3 PFE0 LU0              OK          69 degrees C / 156 degrees F
      FPC 3 XF1                   OK          62 degrees C / 143 degrees F
      FPC 3 XF0                   OK          63 degrees C / 145 degrees F
      FPC 3 XM1                   OK          43 degrees C / 109 degrees F
      FPC 3 XM0                   OK          67 degrees C / 152 degrees F
      FPC 3 PFE0 LU1              OK          63 degrees C / 145 degrees F
      FPC 3 PFE0 LU2              OK          66 degrees C / 150 degrees F
      FPC 3 PFE1 LU1              OK          41 degrees C / 105 degrees F
      FPC 5 Top                   OK          39 degrees C / 102 degrees F
      FPC 5 Bottom                OK          38 degrees C / 100 degrees F
      FPC 6 Fan Intake            OK          33 degrees C / 91 degrees F
      FPC 6 Fan Exhaust           OK          49 degrees C / 120 degrees F
      FPC 6 PMB                   OK          40 degrees C / 104 degrees F
      FPC 6 LMB0                  OK          60 degrees C / 140 degrees F
      FPC 6 LMB1                  OK          58 degrees C / 136 degrees F
      FPC 6 LMB2                  OK          40 degrees C / 104 degrees F
      FPC 6 PFE1 LU2              OK          69 degrees C / 156 degrees F
      FPC 6 PFE1 LU0              OK          45 degrees C / 113 degrees F
      FPC 6 PFE0 LU0              OK          71 degrees C / 159 degrees F
      FPC 6 XF1                   OK          58 degrees C / 136 degrees F
      FPC 6 XF0                   OK          65 degrees C / 149 degrees F
      FPC 6 XM1                   OK          39 degrees C / 102 degrees F
      FPC 6 XM0                   OK          66 degrees C / 150 degrees F
      FPC 6 PFE0 LU1              OK          69 degrees C / 156 degrees F
      FPC 6 PFE0 LU2              OK          69 degrees C / 156 degrees F
      FPC 6 PFE1 LU1              OK          42 degrees C / 107 degrees F
      FPM GBUS                    OK          24 degrees C / 75 degrees F
      FPM Display                 OK          27 degrees C / 80 degrees F
Fans  Top Left Front fan          OK          Spinning at high speed
      Top Left Middle fan         OK          Spinning at high speed
      Top Left Rear fan           OK          Spinning at high speed
      Top Right Front fan         OK          Spinning at high speed
      Top Right Middle fan        OK          Spinning at high speed
      Top Right Rear fan          OK          Spinning at high speed
      Bottom Left Front fan       OK          Spinning at high speed
      Bottom Left Middle fan      OK          Spinning at high speed
      Bottom Left Rear fan        OK          Spinning at high speed
      Bottom Right Front fan      OK          Spinning at high speed
      Bottom Right Middle fan     OK          Spinning at high speed
      Bottom Right Rear fan       OK          Spinning at high speed
      Rear Tray Top fan           OK          Spinning at high speed
      Rear Tray Second fan        OK          Spinning at high speed
      Rear Tray Third fan         OK          Spinning at high speed
      Rear Tray Fourth fan        OK          Spinning at high speed
      Rear Tray Fifth fan         OK          Spinning at high speed
      Rear Tray Sixth fan         OK          Spinning at high speed
      Rear Tray Seventh fan       OK          Spinning at high speed
      Rear Tray Bottom fan        OK          Spinning at high speed
Misc  CIP                         OK
      SPMB 0                      OK
      SPMB 1                      OK
```

show chassis environment (TX Matrix Router)

```
user@host> show chassis environment
scc-re0:
--------------------------------------------------------------------------
Class Item                     Status     Measurement
Temp  PEM 0                    Absent
      PEM 1                    OK         29 degrees C / 84 degrees F
      Routing Engine 0         OK         34 degrees C / 93 degrees F
      Routing Engine 1         OK         34 degrees C / 93 degrees F
      CB 0                     OK         32 degrees C / 89 degrees F
      CB 1                     OK         32 degrees C / 89 degrees F
      SIB 0                    OK         44 degrees C / 111 degrees F
      SIB 0 (B)                OK         44 degrees C / 111 degrees F
      FPM GBUS                 OK         27 degrees C / 80 degrees F
      FPM Display              OK         32 degrees C / 89 degrees F
Fans  Top Left Front fan       OK         Spinning at normal speed
      Top Left Middle fan      OK         Spinning at normal speed
      Top Left Rear fan        OK         Spinning at normal speed
      Top Right Front fan      OK         Spinning at normal speed
      Top Right Middle fan     OK         Spinning at normal speed
      Top Right Rear fan       OK         Spinning at normal speed
      Bottom Left Front fan    OK         Spinning at normal speed
      Bottom Left Middle fan OK           Spinning at normal speed
      Bottom Left Rear fan     OK         Spinning at normal speed
      Bottom Right Front fan OK           Spinning at normal speed
      Bottom Right Middle fan OK          Spinning at normal speed
      Bottom Right Rear fan    OK         Spinning at normal speed
      Rear Tray Top fan        OK         Spinning at normal speed
      Rear Tray Second fan     OK         Spinning at normal speed
      Rear Tray Third fan      OK         Spinning at normal speed
      Rear Tray Fourth fan     OK         Spinning at normal speed
      Rear Tray Fifth fan      OK         Spinning at normal speed
      Rear Tray Sixth fan      OK         Spinning at normal speed
      Rear Tray Seventh fan    OK         Spinning at normal speed
      Rear Tray Bottom fan     OK         Spinning at normal speed
Misc  CIP 0                    OK
      CIP 1                    OK
      SPMB 0                   OK
      SPMB 1                   OK

lcc0-re0:
--------------------------------------------------------------------------
Class Item                     Status     Measurement
Temp  PEM 0                    OK         29 degrees C / 84 degrees F
      PEM 1                    Absent
      SCG 0                    OK         35 degrees C / 95 degrees F
      SCG 1                    Absent
      Routing Engine 0         OK         39 degrees C / 102 degrees F
      Routing Engine 1         OK         36 degrees C / 96 degrees F
      CB 0                     OK         32 degrees C / 89 degrees F
      CB 1                     OK         32 degrees C / 89 degrees F
      SIB 0                    OK         40 degrees C / 104 degrees F
      SIB 0 (B)                OK         51 degrees C / 123 degrees F
      FPC 0 Top                OK         45 degrees C / 113 degrees F
      FPC 0 Bottom             OK         31 degrees C / 87 degrees F
      FPC 1 Top                OK         34 degrees C / 93 degrees F
      FPC 1 Bottom             OK         31 degrees C / 87 degrees F
      FPM GBUS                 OK         30 degrees C / 86 degrees F
      FPM Display              OK         34 degrees C / 93 degrees F
Fans  Top Left Front fan       OK         Spinning at normal speed
```

```
        Top Left Middle fan     OK         Spinning at normal speed
        Top Left Rear fan       OK         Spinning at normal speed
        Top Right Front fan     OK         Spinning at normal speed
        Top Right Middle fan    OK         Spinning at normal speed
        Top Right Rear fan      OK         Spinning at normal speed
        Bottom Left Front fan   OK         Spinning at normal speed
        Bottom Left Middle fan  OK         Spinning at normal speed
        Bottom Left Rear fan    OK         Spinning at normal speed
        Bottom Right Front fan  OK         Spinning at normal speed
        Bottom Right Middle fan OK         Spinning at normal speed
        Bottom Right Rear fan   OK         Spinning at normal speed
        Rear Tray Top fan       OK         Spinning at normal speed
        Rear Tray Second fan    OK         Spinning at normal speed
        Rear Tray Third fan     OK         Spinning at normal speed
        Rear Tray Fourth fan    OK         Spinning at normal speed
        Rear Tray Fifth fan     OK         Spinning at normal speed
        Rear Tray Sixth fan     OK         Spinning at normal speed
        Rear Tray Seventh fan   OK         Spinning at normal speed
        Rear Tray Bottom fan    OK         Spinning at normal speed
Misc    CIP                     OK
        SPMB 0                  OK
        SPMB 1                  OK

lcc2-re0:
--------------------------------------------------------------------------
Class Item                      Status     Measurement
Temp    PEM 0                   OK         29 degrees C / 84 degrees F
        PEM 1                   Absent
        SCG 0                   OK         32 degrees C / 89 degrees F
        SCG 1                   Absent
        Routing Engine 0        OK         31 degrees C / 87 degrees F
        Routing Engine 1        OK         32 degrees C / 89 degrees F
        CB 0                    OK         30 degrees C / 86 degrees F
        SIB 0                   OK         38 degrees C / 100 degrees F
        SIB 0 (B)               OK         49 degrees C / 120 degrees F
        FPC 0 Top               OK         45 degrees C / 113 degrees F
        FPC 0 Bottom            OK         33 degrees C / 91 degrees F
        FPC 1 Top               OK         37 degrees C / 98 degrees F
        FPC 1 Bottom            OK         33 degrees C / 91 degrees F
        FPM GBUS                OK         30 degrees C / 86 degrees F
        FPM Display             OK         34 degrees C / 93 degrees F
Fans    Top Left Front fan      OK         Spinning at normal speed
        Top Left Middle fan     OK         Spinning at normal speed
...
```

show chassis environment (T1600 Router)

```
user@host> show chassis environment
Class Item                              Status     Measurement
Temp    PEM 0                           OK         27 degrees C / 80 degrees F
        PEM 1                           Absent
        SCG 0                           OK         31 degrees C / 87 degrees F
        SCG 1                           OK         35 degrees C / 95 degrees F
        Routing Engine 0                OK         30 degrees C / 86 degrees F
        Routing Engine 1                OK         30 degrees C / 86 degrees F
        CB 0                            OK         31 degrees C / 87 degrees F
        CB 1                            OK         31 degrees C / 87 degrees F
        SIB 0                           OK         41 degrees C / 105 degrees F
        SIB 0 (B)                       OK         34 degrees C / 93 degrees F
        SIB 1                           OK         0 degrees C / 32 degrees F
        SIB 1 (B)                       OK         0 degrees C / 32 degrees F
```

```
           SIB 2                          OK          0 degrees C / 32 degrees F
           SIB 2 (B)                      OK          0 degrees C / 32 degrees F
           SIB 3                          OK          0 degrees C / 32 degrees F
           SIB 3 (B)                      OK          0 degrees C / 32 degrees F
           SIB 4                          OK          0 degrees C / 32 degrees F
           SIB 4 (B)                      OK          0 degrees C / 32 degrees F
           FPC 0 Top                      OK          49 degrees C / 120 degrees F
           FPC 0 Bottom                   OK          50 degrees C / 122 degrees F
           FPC 1 Top                      OK          48 degrees C / 118 degrees F
           FPC 1 Bottom                   OK          49 degrees C / 120 degrees F
           FPM GBUS                       OK          27 degrees C / 80 degrees F
           FPM Display                    OK          30 degrees C / 86 degrees F
Fans       Top Left Front fan             OK          Spinning at normal speed
           Top Left Middle fan            OK          Spinning at normal speed
           Top Left Rear fan              OK          Spinning at normal speed
           Top Right Front fan            OK          Spinning at normal speed
           Top Right Middle fan           OK          Spinning at normal speed
           Top Right Rear fan             OK          Spinning at normal speed
           Bottom Left Front fan          OK          Spinning at normal speed
           Bottom Left Middle fan         OK          Spinning at normal speed
           Bottom Left Rear fan           OK          Spinning at normal speed
           Bottom Right Front fan         OK          Spinning at normal speed
           Bottom Right Middle fan        OK          Spinning at normal speed
           Bottom Right Rear fan          OK          Spinning at normal speed
           Rear Tray Top fan              OK          Spinning at normal speed
           Rear Tray Second fan           OK          Spinning at normal speed
           Rear Tray Third fan            OK          Spinning at normal speed
           Rear Tray Fourth fan           OK          Spinning at normal speed
           Rear Tray Fifth fan            OK          Spinning at normal speed
           Rear Tray Sixth fan            OK          Spinning at normal speed
           Rear Tray Seventh fan          OK          Spinning at normal speed
           Rear Tray Bottom fan           OK          Spinning at normal speed
Misc       CIP                            OK
           SPMB 0                         OK
           SPMB 1                         OK
```

show chassis environment (TX Matrix Plus Router)

```
user@host> show chassis environment
sfc0-re0:
--------------------------------------------------------------------------
Class Item                           Status     Measurement
Temp  PEM 0                          OK         28 degrees C / 82 degrees F
      PEM 1                          Absent
      Routing Engine 0               OK         27 degrees C / 80 degrees F
      Routing Engine 1               OK         29 degrees C / 84 degrees F
      CB 0 Intake                    OK         26 degrees C / 78 degrees F
      CB 0 Exhaust A                 OK         25 degrees C / 77 degrees F
      CB 0 Exhaust B                 OK         25 degrees C / 77 degrees F
      CB 1 Intake                    OK         26 degrees C / 78 degrees F
      CB 1 Exhaust A                 OK         26 degrees C / 78 degrees F
      CB 1 Exhaust B                 OK         26 degrees C / 78 degrees F
      SIB F13 0                      OK         47 degrees C / 116 degrees F
      SIB F13 0 (B)                  OK         48 degrees C / 118 degrees F
      SIB F13 1                      OK         38 degrees C / 100 degrees F
      SIB F13 1 (B)                  OK         37 degrees C / 98 degrees F
      SIB F2S 0/0                    OK         27 degrees C / 80 degrees F
      SIB F2S 0/2                    OK         28 degrees C / 82 degrees F
      SIB F2S 0/4                    OK         27 degrees C / 80 degrees F
      SIB F2S 0/6                    OK         28 degrees C / 82 degrees F
      SIB F2S 1/0                    OK         26 degrees C / 78 degrees F
```



```
      SIB F2S 1/2                    OK         26 degrees C / 78 degrees F
      SIB F2S 1/4                    OK         26 degrees C / 78 degrees F
      SIB F2S 1/6                    OK         26 degrees C / 78 degrees F
      SIB F2S 2/0                    OK         25 degrees C / 77 degrees F
      SIB F2S 2/2                    OK         25 degrees C / 77 degrees F
      SIB F2S 2/4                    OK         23 degrees C / 73 degrees F
      CIP 0 Intake                   OK         23 degrees C / 73 degrees F
      CIP 0 Exhaust A                OK         24 degrees C / 75 degrees F
      CIP 0 Exhaust B                OK         24 degrees C / 75 degrees F
      CIP 1 Intake                   OK         24 degrees C / 75 degrees F
      CIP 1 Exhaust A                OK         25 degrees C / 77 degrees F
      CIP 1 Exhaust B                OK         25 degrees C / 77 degrees F
Fans  Fan Tray 0 Fan 1               OK         Spinning at normal speed
      Fan Tray 0 Fan 2               OK         Spinning at normal speed
      Fan Tray 0 Fan 3               OK         Spinning at normal speed
      Fan Tray 0 Fan 4               OK         Spinning at normal speed
      Fan Tray 0 Fan 5               OK         Spinning at normal speed
      Fan Tray 0 Fan 6               OK         Spinning at normal speed
      Fan Tray 1 Fan 1               OK         Spinning at normal speed
      Fan Tray 1 Fan 2               OK         Spinning at normal speed
      Fan Tray 1 Fan 3               OK         Spinning at normal speed
      Fan Tray 1 Fan 4               OK         Spinning at normal speed
      Fan Tray 1 Fan 5               OK         Spinning at normal speed
      Fan Tray 1 Fan 6               OK         Spinning at normal speed
      Fan Tray 2 Fan 1               OK         Spinning at normal speed
      Fan Tray 2 Fan 2               OK         Spinning at normal speed
      Fan Tray 2 Fan 3               OK         Spinning at normal speed
      Fan Tray 2 Fan 4               OK         Spinning at normal speed
      Fan Tray 2 Fan 5               OK         Spinning at normal speed
      Fan Tray 2 Fan 6               OK         Spinning at normal speed
      Fan Tray 2 Fan 7               OK         Spinning at normal speed
      Fan Tray 2 Fan 8               OK         Spinning at normal speed
      Fan Tray 2 Fan 9               OK         Spinning at normal speed
      Fan Tray 3 Fan 1               OK         Spinning at normal speed
      Fan Tray 3 Fan 2               OK         Spinning at normal speed
      Fan Tray 3 Fan 3               OK         Spinning at normal speed
      Fan Tray 3 Fan 4               OK         Spinning at normal speed
      Fan Tray 3 Fan 5               OK         Spinning at normal speed
      Fan Tray 3 Fan 6               OK         Spinning at normal speed
      Fan Tray 3 Fan 7               OK         Spinning at normal speed
      Fan Tray 3 Fan 8               OK         Spinning at normal speed
      Fan Tray 3 Fan 9               OK         Spinning at normal speed
      Fan Tray 4 Fan 1               OK         Spinning at normal speed
      Fan Tray 4 Fan 2               OK         Spinning at normal speed
      Fan Tray 4 Fan 3               OK         Spinning at normal speed
      Fan Tray 4 Fan 4               OK         Spinning at normal speed
      Fan Tray 4 Fan 5               OK         Spinning at normal speed
      Fan Tray 4 Fan 6               OK         Spinning at normal speed
      Fan Tray 4 Fan 7               OK         Spinning at normal speed
      Fan Tray 4 Fan 8               OK         Spinning at normal speed
      Fan Tray 4 Fan 9               OK         Spinning at normal speed
      Fan Tray 5 Fan 1               OK         Spinning at normal speed
      Fan Tray 5 Fan 2               OK         Spinning at normal speed
      Fan Tray 5 Fan 3               OK         Spinning at normal speed
      Fan Tray 5 Fan 4               OK         Spinning at normal speed
      Fan Tray 5 Fan 5               OK         Spinning at normal speed
      Fan Tray 5 Fan 6               OK         Spinning at normal speed
      Fan Tray 5 Fan 7               OK         Spinning at normal speed
      Fan Tray 5 Fan 8               OK         Spinning at normal speed
      Fan Tray 5 Fan 9               OK         Spinning at normal speed
Misc  SPMB 0                         OK
```

```
      SPMB 1                        OK

lcc0-re0:
--------------------------------------------------------------------------
Class Item                          Status     Measurement
Temp  PEM 0                         OK         27 degrees C / 80 degrees F
      PEM 1                         Absent
      SCG 0                         OK         31 degrees C / 87 degrees F
      SCG 1                         OK         35 degrees C / 95 degrees F
      Routing Engine 0              OK         30 degrees C / 86 degrees F
      Routing Engine 1              OK         30 degrees C / 86 degrees F
      CB 0                          OK         31 degrees C / 87 degrees F
      CB 1                          OK         31 degrees C / 87 degrees F
      SIB 0                         OK         41 degrees C / 105 degrees F
      SIB 0 (B)                     OK         34 degrees C / 93 degrees F
      SIB 1                         OK         0 degrees C / 32 degrees F
      SIB 1 (B)                     OK         0 degrees C / 32 degrees F
      SIB 2                         OK         0 degrees C / 32 degrees F
      SIB 2 (B)                     OK         0 degrees C / 32 degrees F
      SIB 3                         OK         0 degrees C / 32 degrees F
      SIB 3 (B)                     OK         0 degrees C / 32 degrees F
      SIB 4                         OK         0 degrees C / 32 degrees F
      SIB 4 (B)                     OK         0 degrees C / 32 degrees F
      FPC 0 Top                     OK         49 degrees C / 120 degrees F
      FPC 0 Bottom                  OK         50 degrees C / 122 degrees F
      FPC 1 Top                     OK         48 degrees C / 118 degrees F
      FPC 1 Bottom                  OK         49 degrees C / 120 degrees F
      FPM GBUS                      OK         27 degrees C / 80 degrees F
      FPM Display                   OK         30 degrees C / 86 degrees F
Fans  Top Left Front fan            OK         Spinning at normal speed
      Top Left Middle fan           OK         Spinning at normal speed
      Top Left Rear fan             OK         Spinning at normal speed
      Top Right Front fan           OK         Spinning at normal speed
      Top Right Middle fan          OK         Spinning at normal speed
      Top Right Rear fan            OK         Spinning at normal speed
      Bottom Left Front fan         OK         Spinning at normal speed
      Bottom Left Middle fan        OK         Spinning at normal speed
      Bottom Left Rear fan          OK         Spinning at normal speed
      Bottom Right Front fan        OK         Spinning at normal speed
      Bottom Right Middle fan       OK         Spinning at normal speed
      Bottom Right Rear fan         OK         Spinning at normal speed
      Rear Tray Top fan             OK         Spinning at normal speed
      Rear Tray Second fan          OK         Spinning at normal speed
      Rear Tray Third fan           OK         Spinning at normal speed
      Rear Tray Fourth fan          OK         Spinning at normal speed
      Rear Tray Fifth fan           OK         Spinning at normal speed
      Rear Tray Sixth fan           OK         Spinning at normal speed
      Rear Tray Seventh fan         OK         Spinning at normal speed
      Rear Tray Bottom fan          OK         Spinning at normal speed
Misc  CIP                           OK
      SPMB 0                        OK
      SPMB 1                        OK
```

show chassis environment (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis environment
sfc0-re0:
--------------------------------------------------------------------------
Class Item                          Status     Measurement
Temp  PEM 0                         Check      30 degrees C / 86 degrees F
      PEM 1                         OK         33 degrees C / 91 degrees F
```



```
      Routing Engine 0              OK          28 degrees C / 82 degrees F
      Routing Engine 0 CPU          OK          42 degrees C / 107 degrees F
      Routing Engine 1              OK          29 degrees C / 84 degrees F
      Routing Engine 1 CPU          OK          44 degrees C / 111 degrees F
      CB 0 Intake                   OK          30 degrees C / 86 degrees F
      CB 0 Exhaust A                OK          28 degrees C / 82 degrees F
      CB 0 Exhaust B                OK          30 degrees C / 86 degrees F
      CB 1 Intake                   OK          31 degrees C / 87 degrees F
      CB 1 Exhaust A                OK          27 degrees C / 80 degrees F
      CB 1 Exhaust B                OK          31 degrees C / 87 degrees F
      SIB F13 0 Board               OK          44 degrees C / 111 degrees F
      SIB F13 0 XF Junction         OK          62 degrees C / 143 degrees F
      SIB F13 3 Board               OK          45 degrees C / 113 degrees F
      SIB F13 3 XF Junction         OK          60 degrees C / 140 degrees F
      SIB F13 6 Board               OK          47 degrees C / 116 degrees F
      SIB F13 6 XF Junction         OK          62 degrees C / 143 degrees F
      SIB F2S 0/0 Board             OK          32 degrees C / 89 degrees F
      SIB F2S 0/0 XF Junction       OK          42 degrees C / 107 degrees F
      SIB F2S 0/2 Board             OK          31 degrees C / 87 degrees F
      SIB F2S 0/2 XF Junction       OK          41 degrees C / 105 degrees F
      SIB F2S 0/4 Board             OK          31 degrees C / 87 degrees F
      SIB F2S 0/4 XF Junction       OK          42 degrees C / 107 degrees F
      SIB F2S 0/6 Board             OK          31 degrees C / 87 degrees F
      SIB F2S 0/6 XF Junction       OK          41 degrees C / 105 degrees F
      SIB F2S 1/0 Board             OK          31 degrees C / 87 degrees F
      SIB F2S 1/0 XF Junction       OK          41 degrees C / 105 degrees F
      SIB F2S 1/2 Board             OK          29 degrees C / 84 degrees F
      SIB F2S 1/2 XF Junction       OK          39 degrees C / 102 degrees F
      SIB F2S 1/4 Board             OK          29 degrees C / 84 degrees F
      SIB F2S 1/4 XF Junction       OK          35 degrees C / 95 degrees F
      SIB F2S 1/6 Board             OK          30 degrees C / 86 degrees F
      SIB F2S 1/6 XF Junction       OK          41 degrees C / 105 degrees F
      SIB F2S 2/0 Board             OK          30 degrees C / 86 degrees F
      SIB F2S 2/0 XF Junction       OK          42 degrees C / 107 degrees F
      SIB F2S 2/2 Board             OK          28 degrees C / 82 degrees F
      SIB F2S 2/2 XF Junction       OK          39 degrees C / 102 degrees F
      SIB F2S 2/4 Board             OK          29 degrees C / 84 degrees F
      SIB F2S 2/4 XF Junction       OK          42 degrees C / 107 degrees F
      SIB F2S 2/6 Board             OK          29 degrees C / 84 degrees F
      SIB F2S 2/6 XF Junction       OK          41 degrees C / 105 degrees F
      CIP 0 Intake                  OK          25 degrees C / 77 degrees F
      CIP 0 Exhaust A               OK          26 degrees C / 78 degrees F
      CIP 0 Exhaust B               OK          26 degrees C / 78 degrees F
      CIP 1 Intake                  OK          26 degrees C / 78 degrees F
      CIP 1 Exhaust A               OK          27 degrees C / 80 degrees F
      CIP 1 Exhaust B               OK          27 degrees C / 80 degrees F
Fans  Fan Tray 0 Fan 1              OK          Spinning at normal speed
      Fan Tray 0 Fan 2              OK          Spinning at normal speed
      Fan Tray 0 Fan 3              OK          Spinning at normal speed
      Fan Tray 0 Fan 4              OK          Spinning at normal speed
      Fan Tray 0 Fan 5              OK          Spinning at normal speed
      Fan Tray 0 Fan 6              OK          Spinning at normal speed
      Fan Tray 1 Fan 1              OK          Spinning at normal speed
      Fan Tray 1 Fan 2              OK          Spinning at normal speed
      Fan Tray 1 Fan 3              OK          Spinning at normal speed
      Fan Tray 1 Fan 4              OK          Spinning at normal speed
      Fan Tray 1 Fan 5              OK          Spinning at normal speed
      Fan Tray 1 Fan 6              OK          Spinning at normal speed
      Fan Tray 2 Fan 1              OK          Spinning at normal speed
      Fan Tray 2 Fan 2              OK          Spinning at normal speed
      Fan Tray 2 Fan 3              OK          Spinning at normal speed
```

```
      Fan Tray 2 Fan 4               OK         Spinning at normal speed
      Fan Tray 2 Fan 5               OK         Spinning at normal speed
      Fan Tray 2 Fan 6               OK         Spinning at normal speed
      Fan Tray 2 Fan 7               OK         Spinning at normal speed
      Fan Tray 2 Fan 8               OK         Spinning at normal speed
      Fan Tray 2 Fan 9               OK         Spinning at normal speed
      Fan Tray 3 Fan 1               OK         Spinning at normal speed
      Fan Tray 3 Fan 2               OK         Spinning at normal speed
      Fan Tray 3 Fan 3               OK         Spinning at normal speed
      Fan Tray 3 Fan 4               OK         Spinning at normal speed
      Fan Tray 3 Fan 5               OK         Spinning at normal speed
      Fan Tray 3 Fan 6               OK         Spinning at normal speed
      Fan Tray 3 Fan 7               OK         Spinning at normal speed
      Fan Tray 3 Fan 8               OK         Spinning at normal speed
      Fan Tray 3 Fan 9               OK         Spinning at normal speed
      Fan Tray 4 Fan 1               OK         Spinning at normal speed
      Fan Tray 4 Fan 2               OK         Spinning at normal speed
      Fan Tray 4 Fan 3               OK         Spinning at normal speed
      Fan Tray 4 Fan 4               OK         Spinning at normal speed
      Fan Tray 4 Fan 5               OK         Spinning at normal speed
      Fan Tray 4 Fan 6               OK         Spinning at normal speed
      Fan Tray 4 Fan 7               OK         Spinning at normal speed
      Fan Tray 4 Fan 8               OK         Spinning at normal speed
      Fan Tray 4 Fan 9               OK         Spinning at normal speed
      Fan Tray 5 Fan 1               OK         Spinning at normal speed
      Fan Tray 5 Fan 2               OK         Spinning at normal speed
      Fan Tray 5 Fan 3               OK         Spinning at normal speed
      Fan Tray 5 Fan 4               OK         Spinning at normal speed
      Fan Tray 5 Fan 5               OK         Spinning at normal speed
      Fan Tray 5 Fan 6               OK         Spinning at normal speed
      Fan Tray 5 Fan 7               OK         Spinning at normal speed
      Fan Tray 5 Fan 8               OK         Spinning at normal speed
      Fan Tray 5 Fan 9               Check
Misc  SPMB 0                         OK
      SPMB 1                         OK

lcc0-re0:
--------------------------------------------------------------------------
Class Item                           Status     Measurement
Temp  PEM 0                          OK         29 degrees C / 84 degrees F
      PEM 1                          Check      29 degrees C / 84 degrees F
      SCG 0                          OK         32 degrees C / 89 degrees F
      SCG 1                          OK         33 degrees C / 91 degrees F
      Routing Engine 0               OK         32 degrees C / 89 degrees F
      Routing Engine 0 CPU           OK         51 degrees C / 123 degrees F
      Routing Engine 1               OK         32 degrees C / 89 degrees F
      Routing Engine 1 CPU           OK         49 degrees C / 120 degrees F
      CB 0                           OK         34 degrees C / 93 degrees F
      CB 1                           OK         34 degrees C / 93 degrees F
      SIB 0                          OK         39 degrees C / 102 degrees F
      SIB 0 (B)                      Absent
      SIB 1                          OK         39 degrees C / 102 degrees F
      SIB 1 (B)                      Absent
      SIB 2                          OK         39 degrees C / 102 degrees F
      SIB 2 (B)                      Absent
      FPC 4 Top                      OK         43 degrees C / 109 degrees F
      FPC 4 Bottom                   OK         43 degrees C / 109 degrees F
      FPC 7 Fan Intake               OK         35 degrees C / 95 degrees F
      FPC 7 Fan Exhaust              OK         50 degrees C / 122 degrees F
      FPC 7 PMB                      OK         50 degrees C / 122 degrees F
      FPC 7 LMB0                     OK         55 degrees C / 131 degrees F
```



```
         FPC 7 LMB1                    OK         49 degrees C / 120 degrees F
         FPC 7 LMB2                    OK         39 degrees C / 102 degrees F
         FPC 7 PFE1 LU2                OK         55 degrees C / 131 degrees F
         FPC 7 PFE1 LU0                OK         45 degrees C / 113 degrees F
         FPC 7 PFE0 LU0                OK         62 degrees C / 143 degrees F
         FPC 7 XF1                     OK         52 degrees C / 125 degrees F
         FPC 7 XF0                     OK         61 degrees C / 141 degrees F
         FPC 7 XM1                     OK         39 degrees C / 102 degrees F
         FPC 7 XM0                     OK         56 degrees C / 132 degrees F
         FPC 7 PFE0 LU1                OK         60 degrees C / 140 degrees F
         FPC 7 PFE0 LU2                OK         55 degrees C / 131 degrees F
         FPC 7 PFE1 LU1                OK         41 degrees C / 105 degrees F
         FPM GBUS                      OK         24 degrees C / 75 degrees F
         FPM Display                   OK         28 degrees C / 82 degrees F
Fans     Top Left Front fan            OK         Spinning at normal speed
         Top Left Middle fan           OK         Spinning at normal speed
         Top Left Rear fan             OK         Spinning at normal speed
         Top Right Front fan           OK         Spinning at normal speed
         Top Right Middle fan          OK         Spinning at normal speed
         Top Right Rear fan            OK         Spinning at normal speed
         Bottom Left Front fan         OK         Spinning at normal speed
         Bottom Left Middle fan        OK         Spinning at normal speed
         Bottom Left Rear fan          OK         Spinning at normal speed
         Bottom Right Front fan        OK         Spinning at normal speed
         Bottom Right Middle fan       OK         Spinning at normal speed
         Bottom Right Rear fan         OK         Spinning at normal speed
         Rear Tray fan 1 (Top)         OK         Spinning at normal speed
         Rear Tray fan 2               OK         Spinning at normal speed
         Rear Tray fan 3               OK         Spinning at normal speed
         Rear Tray fan 4               OK         Spinning at normal speed
         Rear Tray fan 5               OK         Spinning at normal speed
         Rear Tray fan 6               OK         Spinning at normal speed
         Rear Tray fan 7               OK         Spinning at normal speed
         Rear Tray fan 8               OK         Spinning at normal speed
         Rear Tray fan 9               OK         Spinning at normal speed
         Rear Tray fan 10              OK         Spinning at normal speed
         Rear Tray fan 11              OK         Spinning at normal speed
         Rear Tray fan 12              OK         Spinning at normal speed
         Rear Tray fan 13              OK         Spinning at normal speed
         Rear Tray fan 14              OK         Spinning at normal speed
         Rear Tray fan 15              OK         Spinning at normal speed
         Rear Tray fan 16 (Bottom)     OK         Spinning at normal speed
Misc     CIP                           OK
         SPMB 0                        OK
         SPMB 1                        OK
```

show chassis environment (EX4200 Standalone Switch)

```
user@switch> show chassis environment
Class Item                             Status     Measurement
Power FPC 0 Power Supply 0             OK
      FPC 0 Power Supply 1             Absent
Temp  FPC 0 CPU                        OK         41 degrees C / 105 degrees F
      FPC 0 EX-PFE1                    OK         42 degrees C / 107 degrees F
      FPC 0 EX-PFE2                    OK         46 degrees C / 114 degrees F
      FPC 0 GEPHY Front Left           OK         25 degrees C / 77 degrees F
      FPC 0 GEPHY Front Right          OK         27 degrees C / 80 degrees F
      FPC 0 Uplink Conn                OK         29 degrees C / 84 degrees F
Fans  FPC 0 Fan 1                      OK         Spinning at normal speed
      FPC 0 Fan 2                      OK         Spinning at normal speed
      FPC 0 Fan 3                      OK         Spinning at normal speed
```

show chassis environment (EX8216 Switch)

```
user@switch> show chassis environment
Class Item                           Status     Measurement
Power PSU 0                          OK
      PSU 1                          OK
      PSU 2                          OK
      PSU 3                          Check
      PSU 4                          Absent
      PSU 5                          Absent
Temp  CB 0 Intake                    OK         23 degrees C / 73 degrees F
      CB 0 Exhaust                   OK         26 degrees C / 78 degrees F
      CB 1 Intake                    OK         22 degrees C / 71 degrees F
      CB 1 Exhaust                   OK         25 degrees C / 77 degrees F
      FPC 4 Intake                   OK         49 degrees C / 120 degrees F
      FPC 4 Exhaust                  OK         59 degrees C / 138 degrees F
      SIB 5 Intake                   OK         25 degrees C / 77 degrees F
      SIB 5 Exhaust                  OK         35 degrees C / 95 degrees F
      SIB 6 Intake                   OK         25 degrees C / 77 degrees F
      SIB 6 Exhaust                  OK         38 degrees C / 100 degrees F
Fans  Top Fan 1                      OK         Spinning at normal speed
      Top Fan 2                      OK         Spinning at normal speed
      Top Fan 3                      OK         Spinning at normal speed
      Top Fan 4                      OK         Spinning at normal speed
      Top Fan 5                      OK         Spinning at normal speed
      Top Fan 6                      OK         Spinning at normal speed
      Top Fan 7                      OK         Spinning at normal speed
      Top Fan 8                      OK         Spinning at normal speed
      Top Fan 9                      OK         Spinning at normal speed
      Bottom Fan 1                   OK         Spinning at normal speed
      Bottom Fan 2                   OK         Spinning at normal speed
      Bottom Fan 3                   OK         Spinning at normal speed
      Bottom Fan 4                   OK         Spinning at normal speed
      Bottom Fan 5                   OK         Spinning at normal speed
      Bottom Fan 6                   OK         Spinning at normal speed
      Bottom Fan 7                   OK         Spinning at normal speed
      Bottom Fan 8                   OK         Spinning at normal speed
      Bottom Fan 9                   OK         Spinning at normal speed
```

show chassis environment (EX9200 Switch)

```
user@switch> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          Check
      PEM 1                          OK         40 degrees C / 104 degrees F
      PEM 2                          OK         40 degrees C / 104 degrees F
      PEM 3                          Absent
      Routing Engine 0               OK         35 degrees C / 95 degrees F
      Routing Engine 0 CPU           OK         33 degrees C / 91 degrees F
      Routing Engine 1               OK         38 degrees C / 100 degrees F
      Routing Engine 1 CPU           OK         33 degrees C / 91 degrees F
      CB 0 Intake                    OK         35 degrees C / 95 degrees F
      CB 0 Exhaust A                 OK         33 degrees C / 91 degrees F
      CB 0 Exhaust B                 OK         40 degrees C / 104 degrees F
      CB 0 ACBC                      OK         39 degrees C / 102 degrees F
      CB 0 XF A                      OK         49 degrees C / 120 degrees F
      CB 0 XF B                      OK         46 degrees C / 114 degrees F
      CB 1 Intake                    OK         37 degrees C / 98 degrees F
      CB 1 Exhaust A                 OK         32 degrees C / 89 degrees F
      CB 1 Exhaust B                 OK         39 degrees C / 102 degrees F
      CB 1 ACBC                      OK         41 degrees C / 105 degrees F
```



```
      CB 1 XF A                      OK         49 degrees C / 120 degrees F
      CB 1 XF B                      OK         49 degrees C / 120 degrees F
      FPC 2 Intake                   OK         37 degrees C / 98 degrees F
      FPC 2 Exhaust A                OK         40 degrees C / 104 degrees F
      FPC 2 Exhaust B                OK         34 degrees C / 93 degrees F
      FPC 2 LU 0 TCAM TSen           OK         44 degrees C / 111 degrees F
      FPC 2 LU 0 TCAM Chip           OK         48 degrees C / 118 degrees F
      FPC 2 LU 0 TSen                OK         44 degrees C / 111 degrees F
      FPC 2 LU 0 Chip                OK         60 degrees C / 140 degrees F
      FPC 2 MQ 0 TSen                OK         44 degrees C / 111 degrees F
      FPC 2 MQ 0 Chip                OK         51 degrees C / 123 degrees F
      FPC 3 Intake                   OK         39 degrees C / 102 degrees F
      FPC 3 Exhaust A                OK         51 degrees C / 123 degrees F

[...Output truncated...]

     Fans  Top Rear Fan              OK         Spinning at intermediate-speed
     Bottom Rear Fan                 OK         Spinning at intermediate-speed
     Top Middle Fan                  OK         Spinning at intermediate-speed
     Bottom Middle Fan               OK         Spinning at intermediate-speed
     Top Front Fan                   OK         Spinning at intermediate-speed
     Bottom Front Fan                OK         Spinning at intermediate-speed
```

show chassis environment (QFX Series and OCX Series)

```
user@switch> show chassis environment
Class Item                           Status     Measurement
Power FPC 0 Power Supply 0           OK
      FPC 0 Power Supply 1           OK
Temp  FPC 0 Sensor TopLeft I         OK         26 degrees C / 78 degrees F
      FPC 0 Sensor TopRight I        OK         24 degrees C / 75 degrees F
      FPC 0 Sensor TopLeft E         OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopRight E        OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopMiddle I       OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopMiddle E       OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Bottom I          OK         34 degrees C / 93 degrees F
      FPC 0 Sensor Bottom E          OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Die Temp          OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Mgmnt Brd I       OK         24 degrees C / 75 degrees F
      FPC 0 Sensor Switch I          OK         28 degrees C / 82 degrees F
Fans  FPC 0 Fan 1 (left)             Failed
      FPC 0 Fan 2 (right)            OK         Spinning at normal speed
      FPC 0 Fan 3 (middle)           OK         Spinning at normal speed
```

show chassis environment interconnect-device (QFabric System)

```
user@switch> show chassis environment interconnect-device IC-A0004
Class Item                           Status     Measurement
      CB 0
      CB 0 L Intake                  OK         30 degrees C / 86 degrees F
      CB 0 R Intake                  OK         31 degrees C / 87 degrees F
      CB 0 L Exhaust                 OK         32 degrees C / 89 degrees F
      CB 0 R Exhaust                 OK         33 degrees C / 91 degrees F
      Routing Engine 0 CPU temp      OK         51 degrees C / 123 degrees F
      CB 1
      CB 1 L Intake                  OK         27 degrees C / 80 degrees F
      CB 1 R Intake                  OK         29 degrees C / 84 degrees F
      CB 1 L Exhaust                 OK         31 degrees C / 87 degrees F
      CB 1 R Exhaust                 OK         32 degrees C / 89 degrees F
      Routing Engine 1 CPU temp      OK         40 degrees C / 104 degrees F
      FC 0 FPC 0
```



```
      FPC 0 L Intake              OK         25 degrees C / 77 degrees F
      FPC 0 R Intake              OK         28 degrees C / 82 degrees F
      FPC 0 L Exhaust             OK         28 degrees C / 82 degrees F
      FPC 0 R Exhaust             OK         29 degrees C / 84 degrees F
      FC 7 FPC 7
      FPC 7 L Intake              OK         25 degrees C / 77 degrees F
      FPC 7 R Intake              OK         26 degrees C / 78 degrees F
      FPC 7 L Exhaust             OK         28 degrees C / 82 degrees F
      FPC 7 R Exhaust             OK         29 degrees C / 84 degrees F
      RC 0 FPC 8
      FPC 8 L Intake              OK         25 degrees C / 77 degrees F
      FPC 8 R Intake              OK         26 degrees C / 78 degrees F
      FPC 8 L Exhaust             OK         32 degrees C / 89 degrees F
      FPC 8 R Exhaust             OK         30 degrees C / 86 degrees F
      RC 7 FPC 15
      FPC 15 L Intake             OK         24 degrees C / 75 degrees F
      FPC 15 R Intake             OK         25 degrees C / 77 degrees F
      FPC 15 L Exhaust            OK         33 degrees C / 91 degrees F
      FPC 15 R Exhaust            OK         31 degrees C / 87 degrees F
Fans  TFT 0 Fan 0                 OK         Spinning at normal speed
Fans  TFT 0 Fan 1                 OK         Spinning at normal speed
Fans  TFT 0 Fan 2                 OK         Spinning at normal speed
Fans  TFT 0 Fan 3                 OK         Spinning at normal speed
Fans  TFT 0 Fan 4                 OK         Spinning at normal speed
Fans  TFT 0 Fan 5                 OK         Spinning at normal speed
Fans  BFT 1 Fan 0                 OK         Spinning at normal speed
Fans  BFT 1 Fan 1                 OK         Spinning at normal speed
Fans  BFT 1 Fan 2                 OK         Spinning at normal speed
Fans  BFT 1 Fan 3                 Check
Fans  BFT 1 Fan 4                 OK         Spinning at normal speed
Fans  BFT 1 Fan 5                 OK         Spinning at normal speed
Fans  SFT 0 Fan 0 Rotor 0         OK         Spinning at normal speed
Fans  SFT 0 Fan 0 Rotor 1         OK         Spinning at normal speed
Fans  SFT 0 Fan 1 Rotor 0         OK         Spinning at normal speed
Fans  SFT 0 Fan 1 Rotor 1         OK         Spinning at normal speed
Fans  SFT 0 Fan 2 Rotor 0         OK         Spinning at normal speed
Fans  SFT 0 Fan 2 Rotor 1         OK         Spinning at normal speed
Fans  SFT 0 Fan 3 Rotor 0         OK         Spinning at normal speed
Fans  SFT 0 Fan 3 Rotor 1         OK         Spinning at normal speed
Fans  SFT 1 Fan 0 Rotor 0         OK         Spinning at normal speed
Fans  SFT 1 Fan 0 Rotor 1         OK         Spinning at normal speed
Fans  SFT 1 Fan 1 Rotor 0         OK         Spinning at normal speed
Fans  SFT 1 Fan 1 Rotor 1         OK         Spinning at normal speed
Fans  SFT 1 Fan 2 Rotor 0         OK         Spinning at normal speed
Fans  SFT 1 Fan 2 Rotor 1         OK         Spinning at normal speed
Fans  SFT 1 Fan 3 Rotor 0         OK         Spinning at normal speed
Fans  SFT 1 Fan 3 Rotor 1         OK         Spinning at normal speed
Fans  SFT 2 Fan 0 Rotor 0         OK         Spinning at normal speed
Fans  SFT 2 Fan 0 Rotor 1         OK         Spinning at normal speed
Fans  SFT 2 Fan 1 Rotor 0         OK         Spinning at normal speed
Fans  SFT 2 Fan 1 Rotor 1         OK         Spinning at normal speed
Fans  SFT 2 Fan 2 Rotor 0         OK         Spinning at normal speed
Fans  SFT 2 Fan 2 Rotor 1         OK         Spinning at normal speed
Fans  SFT 2 Fan 3 Rotor 0         OK         Spinning at normal speed
Fans  SFT 2 Fan 3 Rotor 1         OK         Spinning at normal speed
Fans  SFT 3 Fan 0 Rotor 0         OK         Spinning at normal speed
Fans  SFT 3 Fan 0 Rotor 1         OK         Spinning at normal speed
Fans  SFT 3 Fan 1 Rotor 0         OK         Spinning at normal speed
Fans  SFT 3 Fan 1 Rotor 1         OK         Spinning at normal speed
Fans  SFT 3 Fan 2 Rotor 0         OK         Spinning at normal speed
Fans  SFT 3 Fan 2 Rotor 1         OK         Spinning at normal speed
```



```
Fans  SFT 3 Fan 3 Rotor 0           OK        Spinning at normal speed
Fans  SFT 3 Fan 3 Rotor 1           OK        Spinning at normal speed
Fans  SFT 4 Fan 0 Rotor 0           OK        Spinning at normal speed
Fans  SFT 4 Fan 0 Rotor 1           OK        Spinning at normal speed
Fans  SFT 4 Fan 1 Rotor 0           OK        Spinning at normal speed
Fans  SFT 4 Fan 1 Rotor 1           OK        Spinning at normal speed
Fans  SFT 4 Fan 2 Rotor 0           OK        Spinning at normal speed
Fans  SFT 4 Fan 2 Rotor 1           OK        Spinning at normal speed
Fans  SFT 4 Fan 3 Rotor 0           OK        Spinning at normal speed
Fans  SFT 4 Fan 3 Rotor 1           OK        Spinning at normal speed
Fans  SFT 5 Fan 0 Rotor 0           OK        Spinning at normal speed
Fans  SFT 5 Fan 0 Rotor 1           OK        Spinning at normal speed
Fans  SFT 5 Fan 1 Rotor 0           OK        Spinning at normal speed
Fans  SFT 5 Fan 1 Rotor 1           OK        Spinning at normal speed
Fans  SFT 5 Fan 2 Rotor 0           OK        Spinning at normal speed
Fans  SFT 5 Fan 2 Rotor 1           OK        Spinning at normal speed
Fans  SFT 5 Fan 3 Rotor 0           OK        Spinning at normal speed
Fans  SFT 5 Fan 3 Rotor 1           OK        Spinning at normal speed
Fans  SFT 6 Fan 0 Rotor 0           OK        Spinning at normal speed
Fans  SFT 6 Fan 0 Rotor 1           OK        Spinning at normal speed
Fans  SFT 6 Fan 1 Rotor 0           OK        Spinning at normal speed
Fans  SFT 6 Fan 1 Rotor 1           OK        Spinning at normal speed
Fans  SFT 6 Fan 2 Rotor 0           OK        Spinning at normal speed
Fans  SFT 6 Fan 2 Rotor 1           OK        Spinning at normal speed
Fans  SFT 6 Fan 3 Rotor 0           OK        Spinning at normal speed
Fans  SFT 6 Fan 3 Rotor 1           OK        Spinning at normal speed
Fans  SFT 7 Fan 0 Rotor 0           OK        Spinning at normal speed
Fans  SFT 7 Fan 0 Rotor 1           OK        Spinning at normal speed
Fans  SFT 7 Fan 1 Rotor 0           OK        Spinning at normal speed
Fans  SFT 7 Fan 1 Rotor 1           OK        Spinning at normal speed
Fans  SFT 7 Fan 2 Rotor 0           OK        Spinning at normal speed
Fans  SFT 7 Fan 2 Rotor 1           OK        Spinning at normal speed
Fans  SFT 7 Fan 3 Rotor 0           OK        Spinning at normal speed
Fans  SFT 7 Fan 3 Rotor 1           OK        Spinning at normal speed
Power PEM 0                         OK        30 degrees C / 86 degrees F
Power PEM 1                         OK        30 degrees C / 86 degrees F
Power PEM 2                         OK        30 degrees C / 86 degrees F
Power PEM 3                         Absent
Power PEM 4                         Absent
Power PEM 5                         Absent
```

show chassis environment node-device (QFabric System)

```
user@switch> show chassis environment node-device node1
Class Item                          Status    Measurement
Power node1 Power Supply 0           Absent
      node1 Power Supply 1           Absent
Fans  node1 Fan Tray 0               Testing
      node1 Fan Tray 1               Testing
      node1 Fan Tray 2               Testing
```

show chassis environment pem node-device (QFabric System)

```
user@switch> show chassis environment pem node-device node1
FPC 0 PEM 0 status:
  State                      Check
  Airflow                    Front to Back
  Temperature                OK
  AC Input:                  OK
  DC Output           Voltage(V) Current(A)  Power(W)  Load(%)
                          12         10          120       18
```

```
FPC 0 PEM 1 status:
  State                      Online
  Airflow                    Back to Front
  Temperature                OK
  AC Input:                  OK
  DC Output           Voltage(V) Current(A)  Power(W)  Load(%)
                          11         10          110       17
```

show chassis environment (PTX5000 Packet Transport Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PDU 0                          OK
      PDU 0 PSM 0                    OK         36 degrees C / 96 degrees F
      PDU 0 PSM 1                    OK         38 degrees C / 100 degrees F
      PDU 0 PSM 2                    OK         38 degrees C / 100 degrees F
      PDU 0 PSM 3                    OK         37 degrees C / 98 degrees F
      PDU 1                          Absent
      CCG 0                          OK         44 degrees C / 111 degrees F
      CCG 1                          OK         44 degrees C / 111 degrees F
      Routing Engine 0               OK         62 degrees C / 143 degrees F
      Routing Engine 0 CPU           OK         75 degrees C / 167 degrees F
      Routing Engine 1               OK         51 degrees C / 123 degrees F
      Routing Engine 1 CPU           OK         64 degrees C / 147 degrees F
      CB 0 Intake                    OK         38 degrees C / 100 degrees F
      CB 0 Exhaust A                 OK         46 degrees C / 114 degrees F
      CB 0 Exhaust B                 OK         42 degrees C / 107 degrees F
      CB 1 Intake                    OK         35 degrees C / 95 degrees F
      CB 1 Exhaust A                 OK         39 degrees C / 102 degrees F
      CB 1 Exhaust B                 OK         36 degrees C / 96 degrees F
      SIB 0 Exhaust                  OK         47 degrees C / 116 degrees F
      SIB 0 Junction                 OK         45 degrees C / 113 degrees F
      SIB 1 Exhaust                  OK         44 degrees C / 111 degrees F
      SIB 1 Junction                 OK         43 degrees C / 109 degrees F
      SIB 2 Exhaust                  OK         47 degrees C / 116 degrees F
      SIB 2 Junction                 OK         42 degrees C / 107 degrees F
      SIB 3 Exhaust                  OK         43 degrees C / 109 degrees F
      SIB 3 Junction                 OK         43 degrees C / 109 degrees F
      SIB 4 Exhaust                  OK         47 degrees C / 116 degrees F
      SIB 4 Junction                 OK         42 degrees C / 107 degrees F
      SIB 5 Exhaust                  OK         42 degrees C / 107 degrees F
      SIB 5 Junction                 OK         40 degrees C / 104 degrees F
      SIB 6 Exhaust                  OK         46 degrees C / 114 degrees F
      SIB 6 Junction                 OK         42 degrees C / 107 degrees F
      SIB 7 Exhaust                  OK         43 degrees C / 109 degrees F
      SIB 7 Junction                 OK         39 degrees C / 102 degrees F
      SIB 8 Exhaust                  OK         44 degrees C / 111 degrees F
      SIB 8 Junction                 OK         41 degrees C / 105 degrees F
      FPC 0 PMB                      OK         35 degrees C / 95 degrees F
      FPC 0 Intake                   OK         33 degrees C / 91 degrees F
      FPC 0 Exhaust A                OK         51 degrees C / 123 degrees F
      FPC 0 Exhaust B                OK         43 degrees C / 109 degrees F
      FPC 0 TL0                      OK         48 degrees C / 118 degrees F
      FPC 0 TQ0                      OK         53 degrees C / 127 degrees F
      FPC 0 TL1                      OK         56 degrees C / 132 degrees F
      FPC 0 TQ1                      OK         58 degrees C / 136 degrees F
      FPC 0 TL2                      OK         55 degrees C / 131 degrees F
      FPC 0 TQ2                      OK         56 degrees C / 132 degrees F
      FPC 0 TL3                      OK         59 degrees C / 138 degrees F
      FPC 0 TQ3                      OK         59 degrees C / 138 degrees F
      FPC 2 PMB                      OK         35 degrees C / 95 degrees F
```

```
FPC 2 Intake                OK          34 degrees C / 93 degrees F
FPC 2 Exhaust A             OK          51 degrees C / 123 degrees F
FPC 2 Exhaust B             OK          52 degrees C / 125 degrees F
FPC 2 TL0                   OK          53 degrees C / 127 degrees F
FPC 2 TQ0                   OK          53 degrees C / 127 degrees F
FPC 2 TL1                   OK          57 degrees C / 134 degrees F
FPC 2 TQ1                   OK          58 degrees C / 136 degrees F
FPC 2 TL2                   OK          54 degrees C / 129 degrees F
FPC 2 TQ2                   OK          59 degrees C / 138 degrees F
FPC 2 TL3                   OK          60 degrees C / 140 degrees F
FPC 2 TQ3                   OK          64 degrees C / 147 degrees F
PIC 2/0 Ambient             OK          49 degrees C / 120 degrees F
FPC 3 PMB                   OK          34 degrees C / 93 degrees F
FPC 3 Intake                OK          35 degrees C / 95 degrees F
FPC 3 Exhaust A             OK          54 degrees C / 129 degrees F
FPC 3 Exhaust B             OK          49 degrees C / 120 degrees F
FPC 3 TL0                   OK          49 degrees C / 120 degrees F
FPC 3 TQ0                   OK          55 degrees C / 131 degrees F
FPC 3 TL1                   OK          56 degrees C / 132 degrees F
FPC 3 TQ1                   OK          58 degrees C / 136 degrees F
FPC 3 TL2                   OK          56 degrees C / 132 degrees F
FPC 3 TQ2                   OK          59 degrees C / 138 degrees F
FPC 3 TL3                   OK          62 degrees C / 143 degrees F
FPC 3 TQ3                   OK          63 degrees C / 145 degrees F
PIC 3/1                     Absent
FPC 5 PMB                   OK          35 degrees C / 95 degrees F
FPC 5 Intake                OK          34 degrees C / 93 degrees F
FPC 5 Exhaust A             OK          51 degrees C / 123 degrees F
FPC 5 Exhaust B             OK          53 degrees C / 127 degrees F
FPC 5 TL0                   OK          54 degrees C / 129 degrees F
FPC 5 TQ0                   OK          52 degrees C / 125 degrees F
FPC 5 TL1                   OK          61 degrees C / 141 degrees F
FPC 5 TQ1                   OK          60 degrees C / 140 degrees F
FPC 5 TL2                   OK          55 degrees C / 131 degrees F
FPC 5 TQ2                   OK          55 degrees C / 131 degrees F
FPC 5 TL3                   OK          59 degrees C / 138 degrees F
FPC 5 TQ3                   OK          58 degrees C / 136 degrees F
PIC 5/0 Ambient             OK          51 degrees C / 123 degrees F
PIC 5/1 Ambient             OK          34 degrees C / 93 degrees F
PIC 5/1 cfp-5/1/0           OK          34 degrees C / 93 degrees F
PIC 5/1 cfp-5/1/1           OK          36 degrees C / 96 degrees F
FPC 6 PMB                   OK          36 degrees C / 96 degrees F
FPC 6 Intake                OK          33 degrees C / 91 degrees F
FPC 6 Exhaust A             OK          51 degrees C / 123 degrees F
FPC 6 Exhaust B             OK          39 degrees C / 102 degrees F
FPC 6 TL0                   OK          44 degrees C / 111 degrees F
FPC 6 TQ0                   OK          54 degrees C / 129 degrees F
FPC 6 TL1                   OK          59 degrees C / 138 degrees F
FPC 6 TQ1                   OK          58 degrees C / 136 degrees F
FPC 6 TL2                   OK          60 degrees C / 140 degrees F
FPC 6 TQ2                   OK          57 degrees C / 134 degrees F
FPC 6 TL3                   OK          65 degrees C / 149 degrees F
FPC 6 TQ3                   OK          60 degrees C / 140 degrees F
FPC 7 PMB                   OK          35 degrees C / 95 degrees F
FPC 7 Intake                OK          33 degrees C / 91 degrees F
FPC 7 Exhaust A             OK          53 degrees C / 127 degrees F
FPC 7 Exhaust B             OK          40 degrees C / 104 degrees F
FPC 7 TL0                   OK          46 degrees C / 114 degrees F
FPC 7 TQ0                   OK          58 degrees C / 136 degrees F
FPC 7 TL1                   OK          53 degrees C / 127 degrees F
FPC 7 TQ1                   OK          59 degrees C / 138 degrees F
```

```
      FPC 7 TL2                      OK         56 degrees C / 132 degrees F
      FPC 7 TQ2                      OK         61 degrees C / 141 degrees F
      FPC 7 TL3                      OK         63 degrees C / 145 degrees F
      FPC 7 TQ3                      OK         63 degrees C / 145 degrees F
      FPM I2CS                       OK         37 degrees C / 98 degrees F
Fans  Fan Tray 0 Fan 1               OK         3042 RPM
      Fan Tray 0 Fan 2               OK         3042 RPM
      Fan Tray 0 Fan 3               OK         3000 RPM
      Fan Tray 0 Fan 4               OK         3042 RPM
      Fan Tray 0 Fan 5               OK         3000 RPM
      Fan Tray 0 Fan 6               OK         3042 RPM
      Fan Tray 0 Fan 7               OK         3085 RPM
      Fan Tray 0 Fan 8               OK         3042 RPM
      Fan Tray 0 Fan 9               OK         3042 RPM
      Fan Tray 0 Fan 10              OK         3085 RPM
      Fan Tray 0 Fan 11              OK         3085 RPM
      Fan Tray 0 Fan 12              OK         3128 RPM
      Fan Tray 0 Fan 13              OK         3128 RPM
      Fan Tray 0 Fan 14              OK         3042 RPM
      Fan Tray 1 Fan 1               OK         2299 RPM
      Fan Tray 1 Fan 2               OK         2399 RPM
      Fan Tray 1 Fan 3               OK         2299 RPM
      Fan Tray 1 Fan 4               OK         2266 RPM
      Fan Tray 1 Fan 5               OK         2266 RPM
      Fan Tray 1 Fan 6               OK         2366 RPM
      Fan Tray 2 Fan 1               OK         2199 RPM
      Fan Tray 2 Fan 2               OK         2133 RPM
      Fan Tray 2 Fan 3               OK         2366 RPM
      Fan Tray 2 Fan 4               OK         2233 RPM
      Fan Tray 2 Fan 5               OK         2399 RPM
      Fan Tray 2 Fan 6               OK         2233 RPM
Misc  SPMB 0 Intake                  OK         50 degrees C / 122 degrees F
      SPMB 1 Intake                  OK         40 degrees C / 104 degrees F
```

show chassis environment (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PDU 0                          OK
      PDU 0 PSM 0                    OK         41 degrees C / 105 degrees F
      PDU 0 PSM 1                    Absent
      PDU 0 PSM 2                    OK         43 degrees C / 109 degrees F
      PDU 0 PSM 3                    Absent
      PDU 0 PSM 4                    OK         44 degrees C / 111 degrees F
      PDU 0 PSM 5                    Absent
      PDU 0 PSM 6                    OK         45 degrees C / 113 degrees F
      PDU 0 PSM 7                    Absent
      PDU 1                          OK
      PDU 1 PSM 0                    Absent
      PDU 1 PSM 1                    OK         45 degrees C / 113 degrees F
      PDU 1 PSM 2                    Absent
      PDU 1 PSM 3                    OK         43 degrees C / 109 degrees F
      PDU 1 PSM 4                    Absent
      PDU 1 PSM 5                    OK         46 degrees C / 114 degrees F
      PDU 1 PSM 6                    Absent
      PDU 1 PSM 7                    OK         46 degrees C / 114 degrees F
      CCG 0                          OK         27 degrees C / 80 degrees F
      CCG 1                          OK         29 degrees C / 84 degrees F
...
```


show chassis environment (ACX2000 Universal Access Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
      PCB Left                       OK         44 degrees C / 111 degrees F
      SFP+ Xcvr                      OK         50 degrees C / 122 degrees F
      FEB                            OK         70 degrees C / 158 degrees F
      PCB Up                         OK         63 degrees C / 145 degrees F
      PCB Mid                        OK         66 degrees C / 150 degrees F
      Telecom Mod                    OK         65 degrees C / 149 degrees F
      Routing Engine                 OK         54 degrees C / 129 degrees F
      Heater off
```

show chassis environment (ACX4000 Universal Access Router)

On the ACX4000 router, the MIC output of the **show chassis environment** command varies depending on the number of temperature channels present in the installed MIC.

```
user@host> show chassis environment

Class Item                           Status     Measurement
Temp  PEM 0                          OK         33 degrees C / 91 degrees F
      PEM 1                          Absent
      PCB Bottom                     OK         30 degrees C / 86 degrees F
      PCB Middle                     OK         34 degrees C / 93 degrees F
      BCM56445                       OK         33 degrees C / 91 degrees F
      SFP+ Xcvr                      OK         32 degrees C / 89 degrees F
      Fan tray inlet                 OK         39 degrees C / 102 degrees F
      Exhaust                        OK         30 degrees C / 86 degrees F
      Routing Engine                 OK         32 degrees C / 89 degrees F
      Heater off
Pic   PIC 0/0 Channel 0              OK         28 degrees C / 82 degrees F
      PIC 0/0 Channel 1              OK         29 degrees C / 84 degrees F
      PIC 0/0 Channel 2              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 3              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 4              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 5              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 6              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 7              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 8              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 9              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 0              OK         33 degrees C / 91 degrees F
      PIC 1/0 Channel 1              OK         31 degrees C / 87 degrees F
      PIC 1/0 Channel 2              OK         30 degrees C / 86 degrees F
      PIC 1/0 Channel 3              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 4              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 5              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 6              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 7              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 8              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 0              OK         31 degrees C / 87 degrees F
      PIC 1/1 Channel 1              OK         29 degrees C / 84 degrees F
      PIC 1/1 Channel 2              OK         28 degrees C / 82 degrees F
      PIC 1/1 Channel 3              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 4              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 5              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 6              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 7              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 8              OK         0 degrees C / 32 degrees F
```

```
Fans  Fan 1                             OK         Spinning at normal speed
      Fan 2                             OK         Spinning at normal speed
```

show chassis environment adc

Syntax show chassis environment adc
<*adc-slot-number*>

Release Information Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description Display chassis environmental information about the adapter cards.

Options **none**—Display environmental information about all adapter cards.

adc-slot-number—(Optional) Display environmental information about the specified adapter card. For MX2020 routers, replace ***adc-slot-number*** with a value of **0** through **19**. For MX2010 routers, replace ***adc-slot-number*** with a value of **0** through **9**.

Required Privilege Level view

Related Documentation

- show chassis adc on page 680

List of Sample Output

show chassis environment adc (MX2020 Router) on page 783
show chassis environment adc (MX2010 Router) on page 790

Output Fields Table 47 on page 783 lists the output fields for the **show chassis environment adc** command. Output fields are listed in the approximate order in which they appear.

Table 47: show chassis environment adc Output Fields

Field Name	Field Description
State	Status of the adapter card. • **Online**—The adapter card is online and running. • **Offline**—Adapter card is powered down.
Temperature	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the adapter card. • **Temperature Intake**—Measures the temperature of the air intake. • **Temperature Exhaust**—Measures the temperature of the hot air exhaust. • **ADC-XF1**—Measures the temperature of the ADC chipset, ADC-XF1. • **ADC-XF0**—Measures the temperature of the ADC chipset, ADC-XF0.
Power	Power required and measured on the adapter card. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Sample Output

show chassis environment adc (MX2020 Router)

`user@host>` **show chassis environment adc**

```
ADC 0 status:
  State                      Online
  Intake Temperature         39 degrees C / 102 degrees F
  Exhaust Temperature        50 degrees C / 122 degrees F
  ADC-XF1 Temperature        58 degrees C / 136 degrees F
  ADC-XF0 Temperature        64 degrees C / 147 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 1 status:
  State                      Online
  Intake Temperature         38 degrees C / 100 degrees F
  Exhaust Temperature        48 degrees C / 118 degrees F
  ADC-XF1 Temperature        59 degrees C / 138 degrees F
  ADC-XF0 Temperature        61 degrees C / 141 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 2 status:
  State                      Online
  Intake Temperature         36 degrees C / 96 degrees F
  Exhaust Temperature        50 degrees C / 122 degrees F
  ADC-XF1 Temperature        52 degrees C / 125 degrees F
  ADC-XF0 Temperature        59 degrees C / 138 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
ADC 3 status:
  State                      Online
  Intake Temperature         39 degrees C / 102 degrees F
  Exhaust Temperature        50 degrees C / 122 degrees F
  ADC-XF1 Temperature        61 degrees C / 141 degrees F
  ADC-XF0 Temperature        63 degrees C / 145 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1030 mV
```



```
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1500 mV
      LTC3880-XF0-1.5v-CH0      1500 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1029 mV
      LTC3880-XF1-1.0v-CH0      1029 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1500 mV
      LTC3880-XF1-1.5v-CH0      1500 mV
      LTC3880-XF1-1.5v-CH1      1502 mV
  ADC 4 status:
    State                      Online
    Intake Temperature         38 degrees C / 100 degrees F
    Exhaust Temperature        49 degrees C / 120 degrees F
    ADC-XF1 Temperature        60 degrees C / 140 degrees F
    ADC-XF0 Temperature        62 degrees C / 143 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1029 mV
      LTC3880-XF0-1.0v-CH0      1029 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1500 mV
      LTC3880-XF0-1.5v-CH0      1500 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1029 mV
      LTC3880-XF1-1.0v-CH0      1029 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1500 mV
      LTC3880-XF1-1.5v-CH0      1500 mV
      LTC3880-XF1-1.5v-CH1      1502 mV
  ADC 5 status:
    State                      Online
    Intake Temperature         37 degrees C / 98 degrees F
    Exhaust Temperature        52 degrees C / 125 degrees F
    ADC-XF1 Temperature        55 degrees C / 131 degrees F
    ADC-XF0 Temperature        66 degrees C / 150 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1029 mV
      LTC3880-XF0-1.0v-CH0      1029 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-CH0      1500 mV
      LTC3880-XF1-1.0v-RAIL     1030 mV
      LTC3880-XF1-1.0v-CH0      1030 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-CH0      1500 mV
  ADC 6 status:
    State                      Online
    Intake Temperature         39 degrees C / 102 degrees F
    Exhaust Temperature        51 degrees C / 123 degrees F
    ADC-XF1 Temperature        58 degrees C / 136 degrees F
    ADC-XF0 Temperature        64 degrees C / 147 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1029 mV
      LTC3880-XF0-1.0v-CH0      1029 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1499 mV
      LTC3880-XF0-1.5v-CH0      1499 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1029 mV
      LTC3880-XF1-1.0v-CH0      1029 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
```

```
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1502 mV
ADC 7 status:
  State                       Online
  Intake Temperature          38 degrees C / 100 degrees F
  Exhaust Temperature         52 degrees C / 125 degrees F
  ADC-XF1 Temperature         61 degrees C / 141 degrees F
  ADC-XF0 Temperature         69 degrees C / 156 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      1029 mV
    LTC3880-XF0-1.0v-CH0       1029 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-CH0       1499 mV
    LTC3880-XF1-1.0v-RAIL      1029 mV
    LTC3880-XF1-1.0v-CH0       1029 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-CH0       1500 mV
ADC 8 status:
  State                       Online
  Intake Temperature          38 degrees C / 100 degrees F
  Exhaust Temperature         50 degrees C / 122 degrees F
  ADC-XF1 Temperature         63 degrees C / 145 degrees F
  ADC-XF0 Temperature         64 degrees C / 147 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      1029 mV
    LTC3880-XF0-1.0v-CH0       1029 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1499 mV
    LTC3880-XF0-1.5v-CH0       1499 mV
    LTC3880-XF0-1.5v-CH1       1501 mV
    LTC3880-XF1-1.0v-RAIL      1030 mV
    LTC3880-XF1-1.0v-CH0       1030 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1502 mV
ADC 9 status:
  State                       Online
  Intake Temperature          40 degrees C / 104 degrees F
  Exhaust Temperature         50 degrees C / 122 degrees F
  ADC-XF1 Temperature         59 degrees C / 138 degrees F
  ADC-XF0 Temperature         62 degrees C / 143 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      1029 mV
    LTC3880-XF0-1.0v-CH0       1029 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1500 mV
    LTC3880-XF0-1.5v-CH0       1500 mV
    LTC3880-XF0-1.5v-CH1       1501 mV
    LTC3880-XF1-1.0v-RAIL      1029 mV
    LTC3880-XF1-1.0v-CH0       1029 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1502 mV
ADC 10 status:
  State                       Online
  Intake Temperature          46 degrees C / 114 degrees F
  Exhaust Temperature         52 degrees C / 125 degrees F
  ADC-XF1 Temperature         66 degrees C / 150 degrees F
```



```
    ADC-XF0 Temperature        65 degrees C / 149 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1030 mV
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1499 mV
      LTC3880-XF0-1.5v-CH0      1499 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1029 mV
      LTC3880-XF1-1.0v-CH0      1029 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1500 mV
      LTC3880-XF1-1.5v-CH0      1500 mV
      LTC3880-XF1-1.5v-CH1      1502 mV
  ADC 11 status:
    State                      Online
    Intake Temperature         47 degrees C / 116 degrees F
    Exhaust Temperature        53 degrees C / 127 degrees F
    ADC-XF1 Temperature        64 degrees C / 147 degrees F
    ADC-XF0 Temperature        65 degrees C / 149 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1030 mV
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1500 mV
      LTC3880-XF0-1.5v-CH0      1500 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1029 mV
      LTC3880-XF1-1.0v-CH0      1029 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1499 mV
      LTC3880-XF1-1.5v-CH0      1499 mV
      LTC3880-XF1-1.5v-CH1      1502 mV
  ADC 12 status:
    State                      Online
    Intake Temperature         48 degrees C / 118 degrees F
    Exhaust Temperature        54 degrees C / 129 degrees F
    ADC-XF1 Temperature        66 degrees C / 150 degrees F
    ADC-XF0 Temperature        65 degrees C / 149 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1029 mV
      LTC3880-XF0-1.0v-CH0      1029 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1500 mV
      LTC3880-XF0-1.5v-CH0      1500 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1029 mV
      LTC3880-XF1-1.0v-CH0      1029 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1499 mV
      LTC3880-XF1-1.5v-CH0      1499 mV
      LTC3880-XF1-1.5v-CH1      1502 mV
  ADC 13 status:
    State                      Online
    Intake Temperature         48 degrees C / 118 degrees F
    Exhaust Temperature        55 degrees C / 131 degrees F
    ADC-XF1 Temperature        66 degrees C / 150 degrees F
    ADC-XF0 Temperature        67 degrees C / 152 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1029 mV
      LTC3880-XF0-1.0v-CH0      1029 mV
```

```
      LTC3880-XF0-1.0v-CH1       1033 mV
      LTC3880-XF0-1.5v-RAIL      1500 mV
      LTC3880-XF0-1.5v-CH0       1500 mV
      LTC3880-XF0-1.5v-CH1       1501 mV
      LTC3880-XF1-1.0v-RAIL      1030 mV
      LTC3880-XF1-1.0v-CH0       1030 mV
      LTC3880-XF1-1.0v-CH1       1034 mV
      LTC3880-XF1-1.5v-RAIL      1500 mV
      LTC3880-XF1-1.5v-CH0       1500 mV
      LTC3880-XF1-1.5v-CH1       1503 mV
  ADC 14 status:
    State                       Online
    Intake Temperature          50 degrees C / 122 degrees F
    Exhaust Temperature         57 degrees C / 134 degrees F
    ADC-XF1 Temperature         68 degrees C / 154 degrees F
    ADC-XF0 Temperature         72 degrees C / 161 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL      1030 mV
      LTC3880-XF0-1.0v-CH0       1030 mV
      LTC3880-XF0-1.0v-CH1       1034 mV
      LTC3880-XF0-1.5v-RAIL      1499 mV
      LTC3880-XF0-1.5v-CH0       1499 mV
      LTC3880-XF0-1.5v-CH1       1501 mV
      LTC3880-XF1-1.0v-RAIL      1030 mV
      LTC3880-XF1-1.0v-CH0       1030 mV
      LTC3880-XF1-1.0v-CH1       1034 mV
      LTC3880-XF1-1.5v-RAIL      1499 mV
      LTC3880-XF1-1.5v-CH0       1499 mV
      LTC3880-XF1-1.5v-CH1       1502 mV
  ADC 15 status:
    State                       Online
    Intake Temperature          49 degrees C / 120 degrees F
    Exhaust Temperature         56 degrees C / 132 degrees F
    ADC-XF1 Temperature         68 degrees C / 154 degrees F
    ADC-XF0 Temperature         68 degrees C / 154 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL      1030 mV
      LTC3880-XF0-1.0v-CH0       1030 mV
      LTC3880-XF0-1.0v-CH1       1034 mV
      LTC3880-XF0-1.5v-RAIL      1499 mV
      LTC3880-XF0-1.5v-CH0       1499 mV
      LTC3880-XF0-1.5v-CH1       1501 mV
      LTC3880-XF1-1.0v-RAIL      1030 mV
      LTC3880-XF1-1.0v-CH0       1030 mV
      LTC3880-XF1-1.0v-CH1       1034 mV
      LTC3880-XF1-1.5v-RAIL      1499 mV
      LTC3880-XF1-1.5v-CH0       1499 mV
      LTC3880-XF1-1.5v-CH1       1502 mV
  ADC 16 status:
    State                       Online
    Intake Temperature          51 degrees C / 123 degrees F
    Exhaust Temperature         56 degrees C / 132 degrees F
    ADC-XF1 Temperature         67 degrees C / 152 degrees F
    ADC-XF0 Temperature         68 degrees C / 154 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL      1029 mV
      LTC3880-XF0-1.0v-CH0       1029 mV
      LTC3880-XF0-1.0v-CH1       1033 mV
      LTC3880-XF0-1.5v-RAIL      1499 mV
      LTC3880-XF0-1.5v-CH0       1499 mV
      LTC3880-XF0-1.5v-CH1       1501 mV
```



```
      LTC3880-XF1-1.0v-RAIL     1029 mV
      LTC3880-XF1-1.0v-CH0      1029 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1500 mV
      LTC3880-XF1-1.5v-CH0      1500 mV
      LTC3880-XF1-1.5v-CH1      1502 mV
  ADC 17 status:
    State                      Online
    Intake Temperature         51 degrees C / 123 degrees F
    Exhaust Temperature        56 degrees C / 132 degrees F
    ADC-XF1 Temperature        68 degrees C / 154 degrees F
    ADC-XF0 Temperature        69 degrees C / 156 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1030 mV
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1500 mV
      LTC3880-XF0-1.5v-CH0      1500 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1030 mV
      LTC3880-XF1-1.0v-CH0      1030 mV
      LTC3880-XF1-1.0v-CH1      1034 mV
      LTC3880-XF1-1.5v-RAIL     1500 mV
      LTC3880-XF1-1.5v-CH0      1500 mV
      LTC3880-XF1-1.5v-CH1      1502 mV
  ADC 18 status:
    State                      Online
    Intake Temperature         52 degrees C / 125 degrees F
    Exhaust Temperature        57 degrees C / 134 degrees F
    ADC-XF1 Temperature        66 degrees C / 150 degrees F
    ADC-XF0 Temperature        71 degrees C / 159 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1030 mV
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1034 mV
      LTC3880-XF0-1.5v-RAIL     1499 mV
      LTC3880-XF0-1.5v-CH0      1499 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1030 mV
      LTC3880-XF1-1.0v-CH0      1030 mV
      LTC3880-XF1-1.0v-CH1      1034 mV
      LTC3880-XF1-1.5v-RAIL     1500 mV
      LTC3880-XF1-1.5v-CH0      1500 mV
      LTC3880-XF1-1.5v-CH1      1502 mV
  ADC 19 status:
    State                      Online
    Intake Temperature         49 degrees C / 120 degrees F
    Exhaust Temperature        56 degrees C / 132 degrees F
    ADC-XF1 Temperature        67 degrees C / 152 degrees F
    ADC-XF0 Temperature        70 degrees C / 158 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1029 mV
      LTC3880-XF0-1.0v-CH0      1029 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1499 mV
      LTC3880-XF0-1.5v-CH0      1499 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1030 mV
      LTC3880-XF1-1.0v-CH0      1030 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1500 mV
```

```
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
```

show chassis environment adc (MX2010 Router)

```
user@host> show chassis environment adc
ADC 0 status:
  State                      Online
  Intake Temperature         33 degrees C / 91 degrees F
  Exhaust Temperature        42 degrees C / 107 degrees F
  ADC-XF1 Temperature        46 degrees C / 114 degrees F
  ADC-XF0 Temperature        53 degrees C / 127 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      998 mV
    LTC3880-XF0-1.0v-CH0       998 mV
    LTC3880-XF0-1.0v-CH1      1001 mV
    LTC3880-XF0-1.5v-RAIL     1454 mV
    LTC3880-XF0-1.5v-CH0      1454 mV
    LTC3880-XF0-1.5v-CH1      1456 mV
    LTC3880-XF1-1.0v-RAIL      998 mV
    LTC3880-XF1-1.0v-CH0       998 mV
    LTC3880-XF1-1.0v-CH1      1002 mV
    LTC3880-XF1-1.5v-RAIL     1454 mV
    LTC3880-XF1-1.5v-CH0      1454 mV
    LTC3880-XF1-1.5v-CH1      1457 mV
ADC 1 status:
  State                      Online
  Intake Temperature         32 degrees C / 89 degrees F
  Exhaust Temperature        42 degrees C / 107 degrees F
  ADC-XF1 Temperature        44 degrees C / 111 degrees F
  ADC-XF0 Temperature        52 degrees C / 125 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      998 mV
    LTC3880-XF0-1.0v-CH0       998 mV
    LTC3880-XF0-1.0v-CH1      1002 mV
    LTC3880-XF0-1.5v-RAIL     1454 mV
    LTC3880-XF0-1.5v-CH0      1454 mV
    LTC3880-XF0-1.5v-CH1      1456 mV
    LTC3880-XF1-1.0v-RAIL      999 mV
    LTC3880-XF1-1.0v-CH0       999 mV
    LTC3880-XF1-1.0v-CH1      1002 mV
    LTC3880-XF1-1.5v-RAIL     1454 mV
    LTC3880-XF1-1.5v-CH0      1454 mV
    LTC3880-XF1-1.5v-CH1      1456 mV
ADC 2 status:
  State                      Online
  Intake Temperature         35 degrees C / 95 degrees F
  Exhaust Temperature        42 degrees C / 107 degrees F
  ADC-XF1 Temperature        48 degrees C / 118 degrees F
  ADC-XF0 Temperature        54 degrees C / 129 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
```

```
    LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1502 mV
ADC 3 status:
  State                      Online
  Intake Temperature         35 degrees C / 95 degrees F
  Exhaust Temperature        40 degrees C / 104 degrees F
  ADC-XF1 Temperature        44 degrees C / 111 degrees F
  ADC-XF0 Temperature        51 degrees C / 123 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      999 mV
    LTC3880-XF0-1.0v-CH0       999 mV
    LTC3880-XF0-1.0v-CH1      1002 mV
    LTC3880-XF0-1.5v-RAIL     1454 mV
    LTC3880-XF0-1.5v-CH0      1454 mV
    LTC3880-XF0-1.5v-CH1      1456 mV
    LTC3880-XF1-1.0v-RAIL      999 mV
    LTC3880-XF1-1.0v-CH0       999 mV
    LTC3880-XF1-1.0v-CH1      1002 mV
    LTC3880-XF1-1.5v-RAIL     1454 mV
    LTC3880-XF1-1.5v-CH0      1454 mV
    LTC3880-XF1-1.5v-CH1      1457 mV
ADC 4 status:
  State                      Online
  Intake Temperature         31 degrees C / 87 degrees F
  Exhaust Temperature        43 degrees C / 109 degrees F
  ADC-XF1 Temperature        48 degrees C / 118 degrees F
  ADC-XF0 Temperature        56 degrees C / 132 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 5 status:
  State                      Online
  Intake Temperature         33 degrees C / 91 degrees F
  Exhaust Temperature        43 degrees C / 109 degrees F
  ADC-XF1 Temperature        47 degrees C / 116 degrees F
  ADC-XF0 Temperature        54 degrees C / 129 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      999 mV
    LTC3880-XF0-1.0v-CH0       999 mV
    LTC3880-XF0-1.0v-CH1      1002 mV
    LTC3880-XF0-1.5v-RAIL     1454 mV
    LTC3880-XF0-1.5v-CH0      1454 mV
    LTC3880-XF0-1.5v-CH1      1456 mV
    LTC3880-XF1-1.0v-RAIL      998 mV
    LTC3880-XF1-1.0v-CH0       998 mV
    LTC3880-XF1-1.0v-CH1      1002 mV
    LTC3880-XF1-1.5v-RAIL     1454 mV
 LTC3880-XF1-1.5v-CH0      1454 mV
    LTC3880-XF1-1.5v-CH1      1457 mV
ADC 6 status:
  State                      Online
```

```
    Intake Temperature         32 degrees C / 89 degrees F
    Exhaust Temperature        42 degrees C / 107 degrees F
    ADC-XF1 Temperature        47 degrees C / 116 degrees F
    ADC-XF0 Temperature        55 degrees C / 131 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1030 mV
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1499 mV
      LTC3880-XF0-1.5v-CH0      1499 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1030 mV
      LTC3880-XF1-1.0v-CH0      1030 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1499 mV
      LTC3880-XF1-1.5v-CH0      1499 mV
      LTC3880-XF1-1.5v-CH1      1502 mV
  ADC 7 status:
    State                      Online
    Intake Temperature         36 degrees C / 96 degrees F
    Exhaust Temperature        43 degrees C / 109 degrees F
    ADC-XF1 Temperature        46 degrees C / 114 degrees F
    ADC-XF0 Temperature        55 degrees C / 131 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL     1030 mV
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1500 mV
      LTC3880-XF0-1.5v-CH0      1500 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1030 mV
      LTC3880-XF1-1.0v-CH0      1030 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1499 mV
      LTC3880-XF1-1.5v-CH0      1499 mV
      LTC3880-XF1-1.5v-CH1      1502 mV
  ADC 8 status:
    State                      Online
    Intake Temperature         35 degrees C / 95 degrees F
    Exhaust Temperature        43 degrees C / 109 degrees F
    ADC-XF1 Temperature        44 degrees C / 111 degrees F
    ADC-XF0 Temperature        51 degrees C / 123 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL      999 mV
      LTC3880-XF0-1.0v-CH0       999 mV
      LTC3880-XF0-1.0v-CH1      1002 mV
      LTC3880-XF0-1.5v-RAIL     1455 mV
      LTC3880-XF0-1.5v-CH0      1455 mV
      LTC3880-XF0-1.5v-CH1      1456 mV
      LTC3880-XF1-1.0v-RAIL      999 mV
      LTC3880-XF1-1.0v-CH0       999 mV
      LTC3880-XF1-1.0v-CH1      1002 mV
   LTC3880-XF1-1.5v-RAIL     1455 mV
      LTC3880-XF1-1.5v-CH0      1455 mV
      LTC3880-XF1-1.5v-CH1      1457 mV
  ADC 9 status:
    State                      Online
    Intake Temperature         31 degrees C / 87 degrees F
    Exhaust Temperature        43 degrees C / 109 degrees F
    ADC-XF1 Temperature        48 degrees C / 118 degrees F
    ADC-XF0 Temperature        56 degrees C / 132 degrees F
```

```
Power
  LTC3880-XF0-1.0v-RAIL      1029 mV
  LTC3880-XF0-1.0v-CH0       1029 mV
  LTC3880-XF0-1.0v-CH1       1033 mV
  LTC3880-XF0-1.5v-RAIL      1455 mV
  LTC3880-XF0-1.5v-CH0       1455 mV
  LTC3880-XF0-1.5v-CH1       1457 mV
  LTC3880-XF1-1.0v-RAIL      1029 mV
  LTC3880-XF1-1.0v-CH0       1029 mV
  LTC3880-XF1-1.0v-CH1       1033 mV
  LTC3880-XF1-1.5v-RAIL      1454 mV
  LTC3880-XF1-1.5v-CH0       1454 mV
  LTC3880-XF1-1.5v-CH1       1457 mV
```

show chassis environment cb

List of Syntax

Syntax

show chassis environment cb
<*slot*>

Syntax (TX Matrix Routers)

show chassis environment cb
<lcc *number* | scc>
<*slot*>

Syntax (TX Matrix Plus Routers)

show chassis environment cb
<lcc *number* | sfc *number* >
<*slot*>

Syntax (MX Series Routers)

show chassis environment cb
<*slot*>
<all-members>
<local>
<member *member-id*>

Syntax (MX104 3D Universal Edge Routers)

show chassis environment cb

Syntax (MX2010 and MX2020 3D Universal Edge Routers)

show chassis environment cb
<*slot*>

Syntax (QFabric System)

show chassis environment cb
<*slot* interconnect-device *interconnect-device-name*>
< interconnect-device *interconnect-device-name slot*>

Release Information

Command introduced before Junos Release 7.4.
Command introduced in Junos OS Release 9.4 for EX Series switches.
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.1 for T4000 Core Routers.
sfc option introduced for the TX Matrix Plus router in Junos Release 9.6.
Command introduced in Junos OS Release 11.3 for the QFX Series.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.

Description

(M120, M320, MX Series, and T Series routers, EX8200 switches, and PTX Series Packet Transport Routers only) Display environmental information about the Control Boards

(CBs). 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 or T4000 routers.

all-members—(MX Series routers only) (Optional) Display environmental information about the CBs on all the members of the Virtual Chassis configuration.

interconnect-device—(QFabric systems only) Display environmental information about CBs on the Interconnect device.

lcc *number*—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display environmental information about the CBs on the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display environmental information about the CBs on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

scc—(TX Matrix router only) (Optional) Display environmental information about the CBs in the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus router only) (Optional) Display environmental information about the CBs in the TX Matrix Plus router (or switch-fabric chassis).

slot—(Optional) Display environmental information about the specified CB. On routers and PTX Series Packet Transport Routers, replace ***slot*** with **0** or **1**. On EX Series switches replace ***slot*** with **0**, **1**, or **2**. On QFX Series switches, replace ***slot*** with **0** or **1**.

Required Privilege Level

view

Related Documentation

- request chassis cb on page 616

- *Understanding Switching Control Board Redundancy*
- *Routing Engine and Switching Control Board Redundancy Configuration Statements*

List of Sample Output

Output Fields

Table 48 on page 796 lists the output fields for the **show chassis environment cb** command. Output fields are listed in the approximate order in which they appear.

Table 48: show chassis environment cb Output Fields

Field Name	Field Description
State	Status of the CB. If two CBs are installed and online, one is functioning as the master, and the other is the standby. • **Online**—CB is online and running. • **Offline**— CB is powered down. NOTE: On the EX8208 switch, the installation can include three CBs. See *EX Series Switches Hardware and CLI Terminology Mapping*.
Temperature	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the CB. • **Temperature Intake**—Measures the temperature of the air intake to cool the power supplies. • **Temperature Exhaust**—Measures the temperature of the hot air exhaust. NOTE: On the MX2010 and MX2020 routers, the intake temperature measures the temperature of the air intake to cool the Control Board (CB). The MX2010 and MX2020 routers include intake and exhaust temperatures for multiple zones (**Intake A**, **Intake B**, **Intake C**, **Exhaust A**, **Exhaust B**, and **TCBC**).
Power	Power required and measured on the CB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
BUS Revision	Revision level of the generic bus device. (Not on switches.)

Table 48: 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: • **Expected voltage** • **Measured voltage** • **Measured current** • **Calculated power**

Sample Output

show chassis environment cb (M120 Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                       Online Master
  Temperature                 33 degrees C / 91 degrees F
  Power
    1.2 V                      1214 mV
    1.5 V                      1495 mV
    2.5 V                      2494 mV
    3.3 V                      3319 mV
    5.0 V                      5085 mV
    3.3 V bias                 3296 mV
  Bus Revision                12
  FPGA Revision               17
CB 1 status:
  State                       Online Standby
  Temperature                 34 degrees C / 93 degrees F
  Power
    1.2 V                      1195 mV
    1.5 V                      1495 mV
    2.5 V                      2504 mV
    3.3 V                      3312 mV
    5.0 V                      5111 mV
    3.3 V bias                 3296 mV
  Bus Revision                12
  FPGA Revision               17
```

show chassis environment cb (M320 Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                            Online Master
  Temperature                    29 degrees C / 84 degrees F
  Power:
    1.8 V                     1805 mV
    2.5 V                     2501 mV
    3.3 V                     3293 mV
    4.6 V                     4725 mV
```

```
      5.0 V                    5032 mV
      12.0 V                  11975 mV
      3.3 V bias               3286 mV
      8.0 V bias               7589 mV
    BUS Revision                 40
    FPGA Revision                 7
  CB 1 status:
    State                          Online Standby
    Temperature                  32 degrees C / 89 degrees F
    Power:
      1.8 V                    1802 mV
      2.5 V                    2482 mV
      3.3 V                    3289 mV
      4.6 V                    4720 mV
      5.0 V                    5001 mV
      12.0 V                  11946 mV
      3.3 V bias               3274 mV
      8.0 V bias               7562 mV
    BUS Revision                 40
    FPGA Revision                 7
```

show chassis environment cb (MX80 Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Master
  Temperature                36 degrees C / 96 degrees F
  Power 1
    1.0 V                     1034 mV
    1.0 V MQ                  1037 mV
    1.0 V LU                  1005 mV
    1.2 V                     1218 mV
    1.5 V                     1524 mV
    1.8 V                     1814 mV
    2.5 V                     2558 mV
    3.3 V                     3296 mV
    5.0 V                     5233 mV
    5.0 V bias                5207 mV
    12.0 V                   12162 mV
```

show chassis environment cb (MX104 Router)

```
user@host > show chassis environment cb
CB 0 status:
  State                      Online Master
  Temperature                33 degrees C / 91 degrees F
  Power 1
    0.75 V                     751 mV
    1.0 V                     1005 mV
    1.1 V                     1113 mV
    1.5 V                     1494 mV
    2.5 V                     2518 mV
    3.3 V                     3338 mV
    5.0 V                     4960 mV
    12.0 V                   12006 mV
  FPGA Revision              25
CB 1 status:
  State                      Empty
```


show chassis environment cb (MX240 Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                       Online Standby
  Temperature                 37 degrees C / 98 degrees F
  Power 1
    1.2 V                      1208 mV
    1.5 V                      1521 mV
    1.8 V                      1811 mV
    2.5 V                      2513 mV
    3.3 V                      3332 mV
    5.0 V                      5059 mV
    12.0 V                    12162 mV
    1.25 V                     1260 mV
    3.3 V SM3                  3306 mV
    5.0 V RE                   5085 mV
    12.0 V RE                 11872 mV
  Power 2
    11.3 V bias PEM           11272 mV
    4.6 V bias MidPlane        4827 mV
    11.3 V bias FPD           11272 mV
    11.3 V bias POE 0         11292 mV
    11.3 V bias POE 1         11253 mV
  Bus Revision                42
  FPGA Revision               1
```

show chassis environment cb (MX240 Router with Enhanced MX SCB)

```
user@host> show chassis environment cb
CB 0 status:
  State                       Online Standby
  Temperature                 37 degrees C / 98 degrees F
  Power 1
    1.2 V                      1208 mV
    1.5 V                      1521 mV
    1.8 V                      1811 mV
    2.5 V                      2513 mV
    3.3 V                      3332 mV
    5.0 V                      5059 mV
    12.0 V                    12162 mV
    1.25 V                     1260 mV
    3.3 V SM3                  3306 mV
    5.0 V RE                   5085 mV
    12.0 V RE                 11872 mV
  Power 2
    11.3 V bias PEM           11272 mV
    4.6 V bias MidPlane        4827 mV
    11.3 V bias FPD           11272 mV
    11.3 V bias POE 0         11292 mV
    11.3 V bias POE 1         11253 mV
  Bus Revision                42
  FPGA Revision               1
  PMBus              Expected   Measured   Measured   Calculated
  device             voltage    voltage    current    power
    XF ASIC A         1000 mV     997 mV   11031 mA    10997 mW
    XF ASIC B         1000 mV     996 mV   12125 mA    12076 mW
```

show chassis environment cb (MX480 Router)

```
user@host> show chassis environment cb
```

```
CB 0 status:
  State                      Online Master
  Temperature                41 degrees C / 105 degrees F
  Power 1
    1.2 V                     1202 mV
    1.5 V                     1511 mV
    1.8 V                     1798 mV
    2.5 V                     2507 mV
    3.3 V                     3312 mV
    5.0 V                     5027 mV
    12.0 V                   12200 mV
    1.25 V                    1260 mV
    3.3 V SM3                 3293 mV
    5 V RE                    5040 mV
    12 V RE                  11910 mV
  Power 2
    11.3 V bias PEM          11156 mV
    4.6 V bias MidPlane       4801 mV
    11.3 V bias FPD          11214 mV
    11.3 V bias POE 0        11098 mV
    11.3 V bias POE 1        11330 mV
  Bus Revision               42
  FPGA Revision              1
```

show chassis environment cb (MX480 Router with Enhanced MX SCB)

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Master
  Temperature                41 degrees C / 105 degrees F
  Power 1
    1.2 V                     1202 mV
    1.5 V                     1511 mV
    1.8 V                     1798 mV
    2.5 V                     2507 mV
    3.3 V                     3312 mV
    5.0 V                     5027 mV
    12.0 V                   12200 mV
    1.25 V                    1260 mV
    3.3 V SM3                 3293 mV
    5 V RE                    5040 mV
    12 V RE                  11910 mV
  Power 2
    11.3 V bias PEM          11156 mV
    4.6 V bias MidPlane       4801 mV
    11.3 V bias FPD          11214 mV
    11.3 V bias POE 0        11098 mV
    11.3 V bias POE 1        11330 mV
  Bus Revision               42
  FPGA Revision              1
  PMBus             Expected   Measured   Measured   Calculated
  device            voltage    voltage    current    power
    XF ASIC A        1000 mV     997 mV   11031 mA    10997 mW
    XF ASIC B        1000 mV     996 mV   12125 mA    12076 mW
```

show chassis environment cb (MX960 Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Master
  Temperature                24 degrees C / 75 degrees F
```



```
  Power 1
    1.2 V                     1965 mV
    1.5 V                     2465 mV
    1.8 V                     2990 mV
    2.5 V                     3296 mV
    3.3 V                     3296 mV
    5.0 V                     6593 mV
    12.0 V                   13187 mV
    3.3 V bias                3296 mV
    1.25 V                    1994 mV
    3.3 V SM3                 3296 mV
    5 V RE                    6593 mV
    12 V RE                  13174 mV
  Power 2                    Sensor failure
  Bus Revision               4
  FPGA Revision              3
```

show chassis environment cb (MX960 Router with Enhanced MX SCB)

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Master
  Temperature                24 degrees C / 75 degrees F
  Power 1
    1.2 V                     1965 mV
    1.5 V                     2465 mV
    1.8 V                     2990 mV
    2.5 V                     3296 mV
    3.3 V                     3296 mV
    5.0 V                     6593 mV
    12.0 V                   13187 mV
    3.3 V bias                3296 mV
    1.25 V                    1994 mV
    3.3 V SM3                 3296 mV
    5 V RE                    6593 mV
    12 V RE                  13174 mV
  Power 2                    Sensor failure
  Bus Revision               4
  FPGA Revision              3
  PMBus             Expected   Measured   Measured   Calculated
  device            voltage    voltage    current    power
    XF ASIC A        1000 mV     997 mV   11031 mA    10997 mW
    XF ASIC B        1000 mV     996 mV   12125 mA    12076 mW
```

show chassis environment cb (MX2020 Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Master
  IntakeA-Zone0 Temperature  44 degrees C / 111 degrees F
  IntakeB-Zone1 Temperature  34 degrees C / 93 degrees F
  IntakeC-Zone0 Temperature  45 degrees C / 113 degrees F
  ExhaustA-Zone0 Temperature 43 degrees C / 109 degrees F
  ExhaustB-Zone1 Temperature 36 degrees C / 96 degrees F
  TCBC-Zone0 Temperature     39 degrees C / 102 degrees F
  Power 1
    1.0 V                     1011 mV
    1.2 V                     1208 mV
    1.8 V                     1801 mV
    2.5 V                     2552 mV
    3.3 V                     3312 mV
```



```
    5.0 V                      5040 mV
    5.0 V RE                   4988 mV
    12.0 V                    12065 mV
    12.0 V RE                 12046 mV
  Bus Revision                99
  FPGA Revision               270
CB 1 status:
  State                       Online Standby
  IntakeA-Zone0 Temperature   45 degrees C / 113 degrees F
  IntakeB-Zone1 Temperature   41 degrees C / 105 degrees F
  IntakeC-Zone0 Temperature   46 degrees C / 114 degrees F
  ExhaustA-Zone0 Temperature  44 degrees C / 111 degrees F
  ExhaustB-Zone1 Temperature  41 degrees C / 105 degrees F
  TCBC-Zone0 Temperature      45 degrees C / 113 degrees F
  Power 1
    1.0 V                      1008 mV
    1.2 V                      1208 mV
    1.8 V                      1798 mV
    2.5 V                      2539 mV
    3.3 V                      3325 mV
    5.0 V                      5033 mV
    5.0 V RE                   4950 mV
    12.0 V                    12046 mV
    12.0 V RE                 11968 mV
  Bus Revision                99
  FPGA Revision               0
```

show chassis environment cb (MX2010 Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                       Online Master
  IntakeA-Zone0 Temperature   36 degrees C / 96 degrees F
  IntakeB-Zone1 Temperature   30 degrees C / 86 degrees F
  IntakeC-Zone0 Temperature   38 degrees C / 100 degrees F
  ExhaustA-Zone0 Temperature  36 degrees C / 96 degrees F
  ExhaustB-Zone1 Temperature  32 degrees C / 89 degrees F
  TCBC-Zone0 Temperature      34 degrees C / 93 degrees F
  Power 1
    1.0 V                      1015 mV
    1.2 V                      1205 mV
    1.8 V                      1804 mV
    2.5 V                      2552 mV
    3.3 V                      3325 mV
    5.0 V                      5020 mV
    5.0 V RE                   4988 mV
    12.0 V                    12104 mV
    12.0 V RE                 12026 mV
  Bus Revision                100
  FPGA Revision               270
CB 1 status:
  State                       Online
  IntakeA-Zone0 Temperature   35 degrees C / 95 degrees F
  IntakeB-Zone1 Temperature   28 degrees C / 82 degrees F
  IntakeC-Zone0 Temperature   37 degrees C / 98 degrees F
  ExhaustA-Zone0 Temperature  34 degrees C / 93 degrees F
  ExhaustB-Zone1 Temperature  29 degrees C / 84 degrees F
  TCBC-Zone0 Temperature      32 degrees C / 89 degrees F
  Power 1
    1.0 V                      1011 mV
    1.2 V                      1208 mV
```



```
    1.8 V                     1788 mV
    2.5 V                     2526 mV
    3.3 V                     3319 mV
    5.0 V                     5046 mV
    5.0 V RE                  4975 mV
    12.0 V                   12046 mV
    12.0 V RE                12007 mV
  Bus Revision               100
  FPGA Revision              0
```

show chassis environment cb (T4000 Core Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Master
  Temperature                33 degrees C / 91 degrees F
  Power 1
    1.8 V                     1805 mV
    2.5 V                     2523 mV
    3.3 V                     3324 mV
    3.3 V bias                3296 mV
    4.6 V                     4680 mV
    5.0 V                     4893 mV
    8.0 V bias                7572 mV
    12.0 V                   11916 mV
  Power 2
    1.0 V                      993 mV
    1.2 V                     1210 mV
    3.3 V RE                  3330 mV
  Bus Revision               51
  FPGA Revision              5
CB 1 status:
  State                      Online Standby
  Temperature                33 degrees C / 91 degrees F
  Power 1
    1.8 V                     1810 mV
    2.5 V                     2496 mV
    3.3 V                     3308 mV
    3.3 V bias                3286 mV
    4.6 V                     4692 mV
    5.0 V                     4954 mV
    8.0 V bias                7282 mV
    12.0 V                   11926 mV
  Power 2
    1.0 V                      993 mV
    1.2 V                     1185 mV
    3.3 V RE                  3316 mV
  Bus Revision               51
  FPGA Revision              5
```

show chassis environment cb (TX Matrix Router)

```
user@host> show chassis environment cb
---------------------------------------------------------------------------
CB 0 status:
  State                           Online Master
  Temperature                   32 degrees C / 89 degrees F
  Power:
    1.8 V                    1797 mV
    2.5 V                    2477 mV
    3.3 V                    3311 mV
```

```
    4.6 V                     4727 mV
    5.0 V                     5015 mV
    12.0 V                   12185 mV
    3.3 V bias                3304 mV
    8.0 V bias                7870 mV
  BUS Revision                  40
  FPGA Revision                  1
CB 1 status:
  State                          Online Standby
...

lcc0-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                          Online Master
  Temperature                 32 degrees C / 89 degrees F
  Power:
    1.8 V                     1787 mV
    2.5 V                     2473 mV
    3.3 V                     3306 mV
    4.6 V                     4793 mV
    5.0 V                     5025 mV
    12.0 V                   12156 mV
    3.3 V bias                3289 mV
    8.0 V bias                7609 mV
  BUS Revision                  40
  FPGA Revision                  5
CB 1 status:
  State                          Online Standby
 ....
  BUS Revision                  40
  FPGA Revision                  5

lcc2-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                          Online Master
 ...
CB 1 status:
  State                          Online Standby
 ...
```

show chassis environment cb (TX Matrix Plus Router)

```
user@host> show chassis environment cb
sfc0-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                     Online Master
  Temperature               38 degrees C / 100 degrees F
  Power 1
    1.0 V                    1005 mV
    1.1 V                    1108 mV
    1.2 V                    1205 mV
    1.25 V                   1269 mV
    1.5 V                    1508 mV
    1.8 V                    1814 mV
    2.5 V                    2507 mV
    3.3 V                    3306 mV
    3.3 V bias               3300 mV
    9.0 V                    9058 mV
```

```
    9.0 V RE                 9107 mV
  Power 2
    3.9 V                    3963 mV
    5.0 V                    5020 mV
    9.0 V                    9087 mV
  Bus Revision              79
  FPGA Revision             23
CB 1 status:
  State                     Online Standby
  Temperature               39 degrees C / 102 degrees F
  Power 1
    1.0 V                    1002 mV
    1.1 V                    1105 mV
    1.2 V                    1198 mV
    1.25 V                   1276 mV
    1.5 V                    1504 mV
    1.8 V                    1804 mV
    2.5 V                    2507 mV
    3.3 V                    3300 mV
    3.3 V bias               3293 mV
    9.0 V                    9039 mV
    9.0 V RE                 9049 mV
  Power 2
    3.9 V                    3892 mV
    5.0 V                    5040 mV
    9.0 V                    9058 mV
  Bus Revision              79
  FPGA Revision             23

lcc0-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                     Online Master
  Temperature               39 degrees C / 102 degrees F
  Power 1
    1.8 V                    1799 mV
    2.5 V                    2499 mV
    3.3 V                    3327 mV
    3.3 V bias               3299 mV
    4.6 V                    4673 mV
    5.0 V                    4918 mV
    8.0 V bias               7308 mV
    12.0 V                  11887 mV
  Power 2
    1.0 V                     996 mV
    1.2 V                    1199 mV
    3.3 V RE                 3319 mV
  Bus Revision              51
  FPGA Revision             3
CB 1 status:
  State                     Online Standby
  Temperature               40 degrees C / 104 degrees F
  Power 1
    1.8 V                    1800 mV
    2.5 V                    2496 mV
    3.3 V                    3322 mV
    3.3 V bias               3284 mV
    4.6 V                    4680 mV
    5.0 V                    4954 mV
    8.0 V bias               7284 mV
    12.0 V                  11902 mV
```



```
  Power 2
    1.0 V                      998 mV
    1.2 V                     1205 mV
    3.3 V RE                  3327 mV
  Bus Revision               51
  FPGA Revision              3

lcc1-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                      Online Master
  Temperature                41 degrees C / 105 degrees F
  Power 1
    1.8 V                     1804 mV
    2.5 V                     2517 mV
    3.3 V                     3300 mV
    3.3 V bias                3284 mV
    4.6 V                     4681 mV
    5.0 V                     4927 mV
    8.0 V bias                7357 mV
    12.0 V                   11907 mV
  Power 2
    1.0 V                      991 mV
    1.2 V                     1202 mV
    3.3 V RE                  3301 mV
  Bus Revision               51
  FPGA Revision              3
CB 1 status:
  State                      Online Standby
  Temperature                40 degrees C / 104 degrees F
  Power 1
    1.8 V                     1805 mV
    2.5 V                     2528 mV
    3.3 V                     3324 mV
    3.3 V bias                3289 mV
    4.6 V                     4694 mV
    5.0 V                     4959 mV
    8.0 V bias                7311 mV
    12.0 V                   11926 mV
  Power 2
    1.0 V                      998 mV
    1.2 V                     1200 mV
    3.3 V RE                  3313 mV
  Bus Revision               51
  FPGA Revision              3

lcc2-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                      Online Master
  Temperature                41 degrees C / 105 degrees F
  Power 1
    1.8 V                     1805 mV
    2.5 V                     2494 mV
    3.3 V                     3333 mV
    3.3 V bias                3296 mV
    4.6 V                     4673 mV
    5.0 V                     4901 mV
    8.0 V bias                7343 mV
    12.0 V                   11916 mV
  Power 2
```



```
    1.0 V                     993 mV
    1.2 V                    1213 mV
    3.3 V RE                 3328 mV
  Bus Revision              51
  FPGA Revision             3
CB 1 status:
  State                     Online Standby
  Temperature               41 degrees C / 105 degrees F
  Power 1
    1.8 V                    1804 mV
    2.5 V                    2523 mV
    3.3 V                    3334 mV
    3.3 V bias               3291 mV
    4.6 V                    4697 mV
    5.0 V                    4969 mV
    8.0 V bias               7308 mV
    12.0 V                  11936 mV
  Power 2
    1.0 V                     996 mV
    1.2 V                    1200 mV
    3.3 V RE                 3328 mV
  Bus Revision              51
  FPGA Revision             3

lcc3-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                     Online Master
  Temperature               37 degrees C / 98 degrees F
  Power 1
    1.8 V                    1809 mV
    2.5 V                    2510 mV
    3.3 V                    3296 mV
    3.3 V bias               3291 mV
    4.6 V                    4670 mV
    5.0 V                    4905 mV
    8.0 V bias               7211 mV
    12.0 V                  11882 mV
  Power 2
    1.0 V                     996 mV
    1.2 V                    1188 mV
    3.3 V RE                 3326 mV
  Bus Revision              51
  FPGA Revision             5
CB 1 status:
  State                     Online Standby
  Temperature               38 degrees C / 100 degrees F
  Power 1
    1.8 V                    1813 mV
    2.5 V                    2510 mV
    3.3 V                    3322 mV
    3.3 V bias               3289 mV
    4.6 V                    4692 mV
    5.0 V                    4967 mV
    8.0 V bias               7194 mV
    12.0 V                  11916 mV
  Power 2
    1.0 V                     996 mV
    1.2 V                    1205 mV
    3.3 V RE                 3273 mV
```

```
  Bus Revision                51
  FPGA Revision               5
```

show chassis environment cb (EX8200 Switch)

user@host> **show chassis environment cb**

```
CB 0 status:
  State                       Online Master
  Temperature Intake          20 degrees C / 68 degrees F
  Temperature Exhaust         24 degrees C / 75 degrees F
  Power 1
    1.1 V                      1086 mV
    1.2 V                      1179 mV
    1.2 V *                    1182 mV
    1.2 V *                    1182 mV
    1.25 V                     1211 mV
    1.5 V                      1472 mV
    1.8 V                      1756 mV
    2.5 V                      2449 mV
    3.3 V                      3254 mV
    3.3 V bias                 3300 mV
    5.0 V                      4911 mV
    12.0 V                    11891 mV
  Power 2
    3.3 V bias *               3615 mV
    3.3 V bias *               3615 mV
    3.3 V bias *               3567 mV
    3.3 V bias *               3664 mV
    4.3 V bias *               4224 mV
    4.3 V bias *               4215 mV
    4.3 V bias *               4224 mV
    4.3 V bias *               4205 mV
    4.3 V bias *               4195 mV
    4.3 V bias *               4215 mV
    5.0 V bias                 4920 mV
CB 1 status:
  State                       Online Standby
  Temperature Intake          19 degrees C / 66 degrees F
  Temperature Exhaust         23 degrees C / 73 degrees F
  Power 1
    1.1 V                      1082 mV
    1.2 V                      1169 mV
    1.2 V *                    1179 mV
    1.2 V *                    1179 mV
    1.25 V                     1214 mV
    1.5 V                      1482 mV
    1.8 V                      1759 mV
    2.5 V                      2481 mV
    3.3 V                      3248 mV
    3.3 V bias                 3306 mV
    5.0 V                      4911 mV
    12.0 V                    11910 mV
  Power 2
    3.3 V bias *               3644 mV
    3.3 V bias *               3664 mV
    3.3 V bias *               3586 mV
    3.3 V bias *               3654 mV
    4.3 V bias *               4224 mV
    4.3 V bias *               4215 mV
    4.3 V bias *               4224 mV
```



```
    4.3 V bias *              4205 mV
    4.3 V bias *              4244 mV
    4.3 V bias *              4215 mV
    5.0 V bias                4930 mV
CB 2 status:
  State                      Online
  Temperature Intake         19 degrees C / 66 degrees F
  Temperature Exhaust        23 degrees C / 73 degrees F
  Power 1
    1.2 V                     1195 mV
    1.5 V                     1511 mV
    1.8 V                     1804 mV
    2.5 V                     2526 mV
    3.3 V                     3300 mV
    3.3 V bias                3306 mV
    12.0 V                   12220 mV
```

show chassis environment cb (EX8208 Switch)

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Master
  Temperature Intake         20 degrees C / 68 degrees F
  Temperature Exhaust        24 degrees C / 75 degrees F
  Power 1
    1.1 V                     1086 mV
    1.2 V                     1179 mV
    1.2 V *                   1182 mV
    1.2 V *                   1182 mV
    1.25 V                    1211 mV
    1.5 V                     1466 mV
    1.8 V                     1759 mV
    2.5 V                     2455 mV
    3.3 V                     3261 mV
    3.3 V bias                3300 mV
    5.0 V                     4930 mV
    12.0 V                   11891 mV
  Power 2
    3.3 V bias *              3606 mV
    3.3 V bias *              3615 mV
    3.3 V bias *              3567 mV
    3.3 V bias *              3673 mV
    4.3 V bias *              4224 mV
    4.3 V bias *              4215 mV
    4.3 V bias *              4234 mV
    4.3 V bias *              4205 mV
    4.3 V bias *              4186 mV
    4.3 V bias *              4215 mV
    5.0 V bias                4940 mV
CB 1 status:
  State                      Online Standby
  Temperature Intake         19 degrees C / 66 degrees F
  Temperature Exhaust        23 degrees C / 73 degrees F
  Power 1
    1.1 V                     1086 mV
    1.2 V                     1169 mV
    1.2 V *                   1179 mV
    1.2 V *                   1179 mV
    1.25 V                    1211 mV
    1.5 V                     1479 mV
    1.8 V                     1759 mV
```



```
      2.5 V                       2475 mV
      3.3 V                       3235 mV
      3.3 V bias                  3306 mV
      5.0 V                       4930 mV
      12.0 V                     11891 mV
    Power 2
      3.3 V bias *                3644 mV
      3.3 V bias *                3664 mV
      3.3 V bias *                3586 mV
      3.3 V bias *                3654 mV
      4.3 V bias *                4215 mV
      4.3 V bias *                4224 mV
      4.3 V bias *                4215 mV
      4.3 V bias *                4215 mV
      4.3 V bias *                4234 mV
      4.3 V bias *                4224 mV
      5.0 V bias                  4920 mV
  CB 2 status:
    State                        Online
    Temperature Intake           20 degrees C / 68 degrees F
    Temperature Exhaust          24 degrees C / 75 degrees F
    Power 1
      1.2 V                       1202 mV
      1.5 V                       1508 mV
      1.8 V                       1804 mV
      2.5 V                       2520 mV
      3.3 V                       3300 mV
      3.3 V bias                  3300 mV
      12.0 V                     12200 mV
```

show chassis environment cb (PTX5000 Packet Transport Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                        Online Master
  Intake Temperature           38 degrees C / 100 degrees F
  Exhaust A Temperature        45 degrees C / 113 degrees F
  Exhaust B Temperature        42 degrees C / 107 degrees F
  Power 1
    1.2 V                       1200 mV
    1.25 V                      1250 mV
    2.5 V                       2500 mV
    3.3 V                       3300 mV
  Power 2
    1.0 V                       1000 mV
    3.3 V bias                  3293 mV
    3.9 V                       3921 mV
  Bus Revision                 132
  FPGA Revision                27
CB 1 status:
  State                        Online Standby
  Intake Temperature           34 degrees C / 93 degrees F
  Exhaust A Temperature        39 degrees C / 102 degrees F
  Exhaust B Temperature        36 degrees C / 96 degrees F
  Power 1
    1.2 V                       1199 mV
    1.25 V                      1250 mV
    2.5 V                       2499 mV
    3.3 V                       3299 mV
  Power 2
    1.0 V                       1000 mV
```



```
    3.3 V bias                3312 mV
    3.9 V                     3961 mV
  Bus Revision               132
  FPGA Revision              28
```

show chassis environment cb (QFabric System)

```
user@switch> show chassis environment cb interconnect-device IC-123 0
CB 0 status:
  State                      Online Master
  Left Intake Temperature    33 degrees C / 91 degrees F
  Right Intake Temperature   33 degrees C / 91 degrees F
  Left Exhaust Temperature   36 degrees C / 96 degrees F
  Right Exhaust Temperature  35 degrees C / 95 degrees F
  Power                      OK
    VDD 3V3                   3294 mV
    VDD 2V5                   2436 mV
    VDD 1V8                   1746 mV
    VDD 1V5                   1460 mV
    VDD 1V25                  1210 mV
    VDD 1V2                   1164 mV
    CPU CORE 1V2              1120 mV
    VDD 1V0                    968 mV
    VDD 5V0                   5088 mV
    CPU MP BIAS 4V3           4050 mV
    BIAS 3V3                  3180 mV
    VTT 0V9                    866 mV
```


show chassis environment ccg

Syntax

show chassis environment ccg
<*slot*>

Release Information

Command introduced in Junos OS Release 12.1.

Description

(PTX5000 Packet Transport Routers only) Display environmental information about the Centralized Clock Generators (CCGs).

Options

none—Display environmental information about all CCGs on the router.

slot —(Optional) Display environmental information about the specified CCG. Replace *slot* with 0 or 1.

Required Privilege Level

view

Related Documentation

- Clock Sources for PTX Series Packet Transport Routers on page 317
- show chassis environment on page 719

List of Sample Output

show chassis environment ccg (PTX5000) on page 812

Output Fields

Table 49 on page 812 lists the output fields for the **show chassis environment ccg** command. Output fields are listed in the approximate order in which they appear.

Table 49: show chassis environment cb Output Fields

Field Name	Field Description
State	Status of the CCG: **Online - Master clock** , **Online - Standby**, or **Offline**. If two CCGs are installed and online, one is functioning as the master clock, and the other is the standby clock.
Temperature	Temperature of the air flowing past the CCG.
Power	Power required and measured on the CCG. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.

Sample Output

show chassis environment ccg (PTX5000)

```
user@host> show chassis environment ccg
CCG 0 status:
  State                       Online -  Master clock
  Temperature                 31 degrees C / 87 degrees F
  Power
    1.2 V bias                 1200 mV
```



```
      1.8 V                    1799 mV
      3.3 V                    3300 mV
      3.3 V bias               3300 mV
    Bus Revision              103
  CCG 1 status:
    State                     Offline
    Power                     Disabled
    Temperature               31 degrees C / 87 degrees F
    Power
      1.2 V bias               1198 mV
      1.8 V                     161 mV
      3.3 V                     451 mV
      3.3 V bias               3311 mV
    Bus Revision              103
```

show chassis environment fpc

List of Syntax

Syntax on page 814
Syntax (TX Matrix and TX Matrix Plus Routers) on page 814
Syntax (MX Series Routers) on page 814
Syntax (MX2010 3D Universal Edge Routers) on page 814
Syntax (MX2020 3D Universal Edge Routers) on page 814
Syntax (QFX Series) on page 814
Syntax (OCX Series) on page 814

Syntax

show chassis environment fpc
<*slot*>

Syntax (TX Matrix and TX Matrix Plus Routers)

show chassis environment fpc
<lcc *number*>
<*slot*>

Syntax (MX Series Routers)

show chassis environment fpc
<*slot*>
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis environment fpc
<*slot*>

Syntax (MX2020 3D Universal Edge Routers)

show chassis environment fpc
<*slot*>

Syntax (QFX Series)

show chassis environment fpc
<fpc-slot>
interconnect-device *name*

Syntax (OCX Series)

show chassis environment fpc <fpc-slot>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for QFX Series.
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.1 for T4000 Core Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

(M40e, M120, M160, M320, MX Series, T Series routers, EX Series, QFX Series, and PTX Series routers only) Display environmental information about Flexible PIC Concentrators (FPCs).

Options

none—Display environmental information about all FPCs. On a TX Matrix router, display environmental information about all FPCs on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about all FPCs on the TX Matrix Plus router and its attached routers.

all-members—(MX Series routers only) (Optional) Display environmental information for the FPCs in all the members of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display chassis environmental information for the Interconnect device.

lcc *number*—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display environmental information for the FPCs in the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display environmental information for the FPCs in the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

slot **or** ***fpc-slot***—(Optional) Display environmental information about an individual FPC:

- (TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, if you specify the number of the T640 router by using only the **lcc *number*** option (the recommended method), replace ***slot*** with a value from **0** through **7**. Similarly, on a TX Matrix Plus router, if you specify the number of the router by using only the **lcc *number*** option (the recommended method), replace ***slot*** with a value from **0** through **7**. Otherwise, replace ***slot*** with a value from **0** through **31**. For example, the following commands have the same result:

  user@host> **show chassis environment fpc 1 lcc 1**
  user@host> **show chassis environment fpc 9**

- M120 router—Replace ***slot*** with a value from **0** through **5.**
- MX240 router—Replace ***slot*** with a value from **0** through **2**.
- MX480 router—Replace ***slot*** with a value from **0** through **5**.
- MX960 router—Replace ***slot*** with a value from **0** through **11**.
- MX2010 router—Replace ***slot*** with a value from **0** through **9**.

- MX2020 router—Replace ***slot*** with a value from **0** through **19**.
- Other routers—Replace ***slot*** with a value from **0** through **7**.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—Replace ***slot*** with 0.
  - EX4200 switches in a Virtual Chassis configuration—Replace ***slot*** with a value from 0 through 9 (switch's member ID).
  - EX6210 switches–Replace ***slot*** with a value from 0 through 3 (line card only), 4 or 5 (line card or Switch Fabric and Rotuing Engine (SRE) module), or 6 through 9 (line card only).
  - EX8208 switches—Replace ***slot*** with a value from 0 through 7 (line card).
  - EX8216 switches—Replace ***slot*** with a value from 0 through 15 (line card).
- QFX3500 switches —Replace ***fpc-slot*** with 0 through 15.
- PTX5000 Packet Transport Router—Replace ***fpc-slot*** with 0 through 7.

Required Privilege Level view

Related Documentation

- request chassis fpc on page 631
- show chassis fpc on page 1212
- show chassis fpc-feb-connectivity on page 1250
- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 289

- *MX960 Flexible PIC Concentrator Description*

List of Sample Output

show chassis environment fpc 0 (PTX5000 Packet Transport Router) on page 837
show chassis environment fpc 07 (PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 838
show chassis environment FPC 1 (MX Routers with Media Services Blade [MSB]) on page 839

Output Fields Table 50 on page 817 lists the output fields for the **show chassis environment fpc** command. Output fields are listed in the approximate order in which they appear.

Table 50: show chassis environment fpc Output Fields

Field Name	Field Description
State	Status of the FPC: • **Unknown**—FPC is not detected by the router. • **Empty**—No FPC is present. • **Present**—FPC is detected by the chassis daemon but is either not supported by the current version of the Junos OS, or the FPC is coming up but not yet online. • **Ready**—FPC is in intermediate or transition state. • **Announce online**—Intermediate state during which the FPC is coming up but not yet online, and the chassis manager acknowledges the chassisd FPC online initiative. • **Online**—FPC is online and running. • **Offline**—FPC is powered down. • **Diagnostics**—FPC is set to operate in diagnostics mode.
Temperature	(M40e and M160 routers and QFX Series only) Temperature of the air flowing past the FPC.
PMB Temperature	(PTX Series only) Temperature of the air flowing past the PMB (bottom of the FPC). The PTX5000 Packet Transport Router with FPC2-PTX-P1A include multiple temperatures for PMB (**TEMP0** and **TEMP1**).
PMB CPU Temperature	(PTX5000 Packet Transport Router with FPC2-PTX-P1A only) Temperature of the air flowing past the PMB CPU.
Temperature Intake	(M320 routers, MX2010 routers, MX2020 routers, and PTX Series only) Temperature of the air flowing into the chassis.
Temperature Top	(T Series routers only) Temperature of the air flowing past the top of the FPC.
Temperature Exhaust	(M120 and M320 routers, MX2010 routers, MX2020 routers, and PTX Series only) Temperature of the air flowing out of the chassis. The PTX Series Packet Transport Routers, and the MX2010 and MX2020 routers include exhaust temperatures for multiple zones (**Exhaust A** and **Exhaust B**).
Temperature Bottom	(T Series routers only) Temperature of the air flowing past the bottom of the FPC.
TL *n* Temperature	(PTX Series only) Temperature of the air flowing past the specified TL area of the packet forwarding engine (PFE) on the FPC.
TQ *n* Temperature	(PTX Series only) Temperature of the air flowing past the specified TQ area of the packet forwarding engine (PFE) on the FPC.

Table 50: show chassis environment fpc Output Fields *(continued)*

Field Name	Field Description
Temperature MMBO	(T640 router only) Temperature of the air flowing past the type 3 FPC.
Temperature MMB1	(M320 and T Series routers only) Temperature of the air flowing past the type 1, type 2, and type 3 FPC.
Power	Information about the voltage supplied to the FPC. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
CMB Revision or **BUS revision**	Revision level of the chassis management bus device (M Series router) or bus (T Series routers).

Sample Output

show chassis environment fpc (M120 Router)

```
user@host> show chassis environment fpc
FPC 2 status:
  State                      Online
  Temperature Exhaust A      32 degrees C / 89 degrees F
  Temperature Exhaust B      31 degrees C / 87 degrees F
  Power A-Board
    1.2 V                     1202 mV
    1.5 V                     1508 mV
    1.8 V                     1798 mV
    2.5 V                     2507 mV
    3.3 V                     3351 mV
    5.0 V                     4995 mV
    3.3 V bias                3296 mV
    1.2 V Rocket IO           1205 mV
    1.5 V Rocket IO           1501 mV
  I2C Slave Revision         12
FPC 3 status:
  State                      Online
  Temperature Exhaust A      31 degrees C / 87 degrees F
  Temperature Exhaust B      33 degrees C / 91 degrees F
  Power A-Board
    1.2 V                     1211 mV
    1.5 V                     1501 mV
    1.8 V                     1798 mV
    2.5 V                     2471 mV
    3.3 V                     3293 mV
    5.0 V                     4930 mV
    3.3 V bias                3296 mV
    1.2 V Rocket IO           1205 mV
    1.5 V Rocket IO           1501 mV
  Power B-Board
    1.2 V                     1214 mV
    1.5 V                     1501 mV
    2.5 V                     2471 mV
    3.3 V                     3300 mV
    5.0 V                     4943 mV
    3.3 V bias                3296 mV
    1.2 V Rocket IO           1205 mV
    1.5 V Rocket IO           1501 mV
```

```
  I2C Slave Revision         12
FPC 4 status:
  State                      Online
  Temperature Exhaust A      32 degrees C / 89 degrees F
  Temperature Exhaust B      30 degrees C / 86 degrees F
  Power A-Board
    1.2 V                     1195 mV
    1.5 V                     1504 mV
    1.8 V                     1801 mV
    2.5 V                     2504 mV
    3.3 V                     3293 mV
    5.0 V                     4917 mV
    3.3 V bias                3296 mV
    1.2 V Rocket IO           1202 mV
    1.5 V Rocket IO           1492 mV
  I2C Slave Revision         12
```

show chassis environment fpc (M160 Router)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                       Online
  Temperature               42 degrees C / 107 degrees F
  Power:
    1.5 V                 1500 mV
    2.5 V                 2509 mV
    3.3 V                 3308 mV
    5.0 V                 4991 mV
    5.0 V bias            4952 mV
    8.0 V bias            8307 mV
  CMB Revision              12
FPC 1 status:
  State                       Online
  Temperature               45 degrees C / 113 degrees F
  Power:
    1.5 V                 1498 mV
    2.5 V                 2501 mV
    3.3 V                 3319 mV
    5.0 V                 5020 mV
    5.0 V bias            5025 mV
    8.0 V bias            8307 mV
  CMB Revision              12
```

show chassis environment fpc (M320 Router)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                           Online
  Temperature Intake           27 degrees C / 80 degrees F
  Temperature Exhaust          38 degrees C / 100 degrees F
  Temperature MMB1             31 degrees C / 87 degrees F
  Power:
    1.5 V                     1487 mV
    1.5 V *                   1494 mV
    1.8 V                     1821 mV
    2.5 V                     2533 mV
    3.3 V                     3323 mV
    5.0 V                     5028 mV
    3.3 V bias                3296 mV
    5.0 V bias                4984 mV
  CMB Revision                  16
```



```
FPC 1 status:
  State                           Online
  Temperature Intake           27 degrees C / 80 degrees F
  Temperature Exhaust          37 degrees C / 98 degrees F
  Temperature MMB1             32 degrees C / 89 degrees F
  Power:
    1.5 V                    1504 mV
    1.5 V *                  1499 mV
    1.8 V                    1820 mV
    2.5 V                    2529 mV
    3.3 V                    3328 mV
    5.0 V                    5013 mV
    3.3 V bias               3294 mV
    5.0 V bias               4984 mV
  CMB Revision                 16
FPC 2 status:
  State                           Online
  Temperature Intake           28 degrees C / 82 degrees F
  Temperature Exhaust          38 degrees C / 100 degrees F
  Temperature MMB1             32 degrees C / 89 degrees F
  Power:
    1.5 V                    1498 mV
    1.5 V *                  1487 mV
    1.8 V                    1816 mV
    2.5 V                    2531 mV
    3.3 V                    3324 mV
    5.0 V                    5025 mV
    3.3 V bias               3277 mV
    5.0 V bias               5013 mV
  CMB Revision                 17
FPC 3 status:
...
```

show chassis environment fpc (MX2020 Router)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                      Online
  Temperature Intake         41 degrees C / 105 degrees F
  Temperature Exhaust A      48 degrees C / 118 degrees F
  Temperature Exhaust B      60 degrees C / 140 degrees F
  Temperature LU 0 TSen      56 degrees C / 132 degrees F
  Temperature LU 0 Chip      59 degrees C / 138 degrees F
  Temperature LU 1 TSen      56 degrees C / 132 degrees F
  Temperature LU 1 Chip      61 degrees C / 141 degrees F
  Temperature LU 2 TSen      56 degrees C / 132 degrees F
  Temperature LU 2 Chip      52 degrees C / 125 degrees F
  Temperature LU 3 TSen      56 degrees C / 132 degrees F
  Temperature LU 3 Chip      52 degrees C / 125 degrees F
  Temperature MQ 0 TSen      49 degrees C / 120 degrees F
  Temperature MQ 0 Chip      49 degrees C / 120 degrees F
  Temperature MQ 1 TSen      49 degrees C / 120 degrees F
  Temperature MQ 1 Chip      52 degrees C / 125 degrees F
  Temperature MQ 2 TSen      49 degrees C / 120 degrees F
  Temperature MQ 2 Chip      45 degrees C / 113 degrees F
  Temperature MQ 3 TSen      49 degrees C / 120 degrees F
  Temperature MQ 3 Chip      46 degrees C / 114 degrees F
  Power
    AS-BIAS3V3-zl2105         3299 mV
    AS-VDD1V8-zl2006          1807 mV
    AS-VDD2V5-zl2006          2512 mV
```



```
    AS-AVDD1V0-zl2004          997 mV
    AS-PCIE_1V0-zl2004         996 mV
    AS-VDD3V3-zl2004          3294 mV
    AS-VDD_1V5A-zl2004        1501 mV
    AS-VDD_1V5B-zl2004        1498 mV
    AS-LU0_1V0-zl2004          998 mV
    AS-LU1_1V0-zl2004         1002 mV
    AS-MQ0_1V0-zl2004          999 mV
    AS-MQ1_1V0-zl2004          994 mV
    AS-LU2_1V0-zl2004         1000 mV
    AS-LU3_1V0-zl2004          998 mV
    AS-MQ2_1V0-zl2004         1002 mV
    AS-MQ3_1V0-zl2004          999 mV
    AS-PMB_1V1-zl2006         1096 mV
  I2C Slave Revision         68
FPC 1 status:
  State                      Online
  Temperature Intake         39 degrees C / 102 degrees F
  Temperature Exhaust A      48 degrees C / 118 degrees F
  Temperature Exhaust B      55 degrees C / 131 degrees F
  Temperature LU 0 TSen      52 degrees C / 125 degrees F
  Temperature LU 0 Chip      54 degrees C / 129 degrees F
  Temperature LU 1 TSen      52 degrees C / 125 degrees F
  Temperature LU 1 Chip      56 degrees C / 132 degrees F
  Temperature LU 2 TSen      52 degrees C / 125 degrees F
  Temperature LU 2 Chip      49 degrees C / 120 degrees F
  Temperature LU 3 TSen      52 degrees C / 125 degrees F
  Temperature LU 3 Chip      50 degrees C / 122 degrees F
  Temperature MQ 0 TSen      48 degrees C / 118 degrees F
  Temperature MQ 0 Chip      48 degrees C / 118 degrees F
  Temperature MQ 1 TSen      48 degrees C / 118 degrees F
  Temperature MQ 1 Chip      51 degrees C / 123 degrees F
  Temperature MQ 2 TSen      48 degrees C / 118 degrees F
  Temperature MQ 2 Chip      45 degrees C / 113 degrees F
  Temperature MQ 3 TSen      48 degrees C / 118 degrees F
  Temperature MQ 3 Chip      45 degrees C / 113 degrees F
  Power
    AS-BIAS3V3-zl2105         3291 mV
    AS-VDD1V8-zl2006          1786 mV
    AS-VDD2V5-zl2006          2496 mV
    AS-AVDD1V0-zl2004         1000 mV
    AS-PCIE_1V0-zl2004        1000 mV
    AS-VDD3V3-zl2004          3294 mV
    AS-VDD_1V5A-zl2004        1500 mV
    AS-VDD_1V5B-zl2004        1498 mV
    AS-LU0_1V0-zl2004         1003 mV
    AS-LU1_1V0-zl2004         1000 mV
    AS-MQ0_1V0-zl2004         1000 mV
    AS-MQ1_1V0-zl2004          995 mV
    AS-LU2_1V0-zl2004         1002 mV
    AS-LU3_1V0-zl2004          997 mV
    AS-MQ2_1V0-zl2004         1000 mV
    AS-MQ3_1V0-zl2004          998 mV
    AS-PMB_1V1-zl2006         1096 mV
  I2C Slave Revision         68
FPC 2 status:
  State                      Online
  Temperature Intake         39 degrees C / 102 degrees F
  Temperature Exhaust A      48 degrees C / 118 degrees F
  Temperature Exhaust B      58 degrees C / 136 degrees F
  Temperature LU 0 TSen      55 degrees C / 131 degrees F
```

```
    Temperature LU 0 Chip      57 degrees C / 134 degrees F
    Temperature LU 1 TSen      55 degrees C / 131 degrees F
    Temperature LU 1 Chip      63 degrees C / 145 degrees F
    Temperature LU 2 TSen      55 degrees C / 131 degrees F
    Temperature LU 2 Chip      51 degrees C / 123 degrees F
    Temperature LU 3 TSen      55 degrees C / 131 degrees F
    Temperature LU 3 Chip      52 degrees C / 125 degrees F
    Temperature MQ 0 TSen      48 degrees C / 118 degrees F
    Temperature MQ 0 Chip      50 degrees C / 122 degrees F
    Temperature MQ 1 TSen      48 degrees C / 118 degrees F
    Temperature MQ 1 Chip      52 degrees C / 125 degrees F
    Temperature MQ 2 TSen      48 degrees C / 118 degrees F
    Temperature MQ 2 Chip      47 degrees C / 116 degrees F
    Temperature MQ 3 TSen      48 degrees C / 118 degrees F
    Temperature MQ 3 Chip      47 degrees C / 116 degrees F
    Power
      AS-BIAS3V3-zl2105         3299 mV
      AS-VDD1V8-zl2006          1805 mV
      AS-VDD2V5-zl2006          2510 mV
      AS-AVDD1V0-zl2004          999 mV
      AS-PCIE_1V0-zl2004         998 mV
      AS-VDD3V3-zl2004          3296 mV
      AS-VDD_1V5A-zl2004        1492 mV
      AS-VDD_1V5B-zl2004        1497 mV
      AS-LU0_1V0-zl2004          997 mV
      AS-LU1_1V0-zl2004         1000 mV
      AS-MQ0_1V0-zl2004          998 mV
      AS-MQ1_1V0-zl2004         1001 mV
      AS-LU2_1V0-zl2004          996 mV
      AS-LU3_1V0-zl2004          995 mV
      AS-MQ2_1V0-zl2004          998 mV
      AS-MQ3_1V0-zl2004          997 mV
      AS-PMB_1V1-zl2006         1100 mV
    I2C Slave Revision         68
  FPC 3 status:
    State                      Online
    Temperature Intake         41 degrees C / 105 degrees F
    Temperature Exhaust A      48 degrees C / 118 degrees F
    Temperature Exhaust B      58 degrees C / 136 degrees F
    Temperature LU 0 TSen      56 degrees C / 132 degrees F
    Temperature LU 0 Chip      59 degrees C / 138 degrees F
    Temperature LU 1 TSen      56 degrees C / 132 degrees F
    Temperature LU 1 Chip      61 degrees C / 141 degrees F
    Temperature LU 2 TSen      56 degrees C / 132 degrees F
    Temperature LU 2 Chip      51 degrees C / 123 degrees F
    Temperature LU 3 TSen      56 degrees C / 132 degrees F
    Temperature LU 3 Chip      53 degrees C / 127 degrees F
    Temperature MQ 0 TSen      50 degrees C / 122 degrees F
    Temperature MQ 0 Chip      51 degrees C / 123 degrees F
    Temperature MQ 1 TSen      50 degrees C / 122 degrees F
    Temperature MQ 1 Chip      55 degrees C / 131 degrees F
    Temperature MQ 2 TSen      50 degrees C / 122 degrees F
    Temperature MQ 2 Chip      47 degrees C / 116 degrees F
    Temperature MQ 3 TSen      50 degrees C / 122 degrees F
    Temperature MQ 3 Chip      50 degrees C / 122 degrees F
    Power
      AS-BIAS3V3-zl2105         3305 mV
      AS-VDD1V8-zl2006          1810 mV
      AS-VDD2V5-zl2006          2508 mV
      AS-AVDD1V0-zl2004          999 mV
      AS-PCIE_1V0-zl2004        1001 mV
```



```
    AS-VDD3V3-zl2004          3294 mV
    AS-VDD_1V5A-zl2004        1500 mV
    AS-VDD_1V5B-zl2004        1498 mV
    AS-LU0_1V0-zl2004          998 mV
    AS-LU1_1V0-zl2004          998 mV
    AS-MQ0_1V0-zl2004          999 mV
    AS-MQ1_1V0-zl2004          998 mV
    AS-LU2_1V0-zl2004         1000 mV
    AS-LU3_1V0-zl2004         1001 mV
    AS-MQ2_1V0-zl2004          996 mV
    AS-MQ3_1V0-zl2004          998 mV
    AS-PMB_1V1-zl2006         1098 mV
  I2C Slave Revision         68
FPC 4 status:
...
```

show chassis environment fpc (MX2010 Router)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                      Online
  Temperature Intake         36 degrees C / 96 degrees F
  Temperature Exhaust A      42 degrees C / 107 degrees F
  Temperature Exhaust B      51 degrees C / 123 degrees F
  Temperature LU 0 TSen      49 degrees C / 120 degrees F
  Temperature LU 0 Chip      50 degrees C / 122 degrees F
  Temperature LU 1 TSen      49 degrees C / 120 degrees F
  Temperature LU 1 Chip      54 degrees C / 129 degrees F
  Temperature LU 2 TSen      49 degrees C / 120 degrees F
  Temperature LU 2 Chip      45 degrees C / 113 degrees F
  Temperature LU 3 TSen      49 degrees C / 120 degrees F
  Temperature LU 3 Chip      46 degrees C / 114 degrees F
  Temperature MQ 0 TSen      40 degrees C / 104 degrees F
  Temperature MQ 0 Chip      41 degrees C / 105 degrees F
  Temperature MQ 1 TSen      40 degrees C / 104 degrees F
  Temperature MQ 1 Chip      44 degrees C / 111 degrees F
  Temperature MQ 2 TSen      40 degrees C / 104 degrees F
  Temperature MQ 2 Chip      38 degrees C / 100 degrees F
  Temperature MQ 3 TSen      40 degrees C / 104 degrees F
  Temperature MQ 3 Chip      41 degrees C / 105 degrees F
  Power
    AS-BIAS3V3-zl2105         3300 mV
    AS-VDD1V8-zl2006          1805 mV
    AS-VDD2V5-zl2006          2505 mV
    AS-AVDD1V0-zl2004          998 mV
    AS-PCIE_1V0-zl2004         999 mV
    AS-VDD3V3-zl2004          3303 mV
    AS-VDD_1V5A-zl2004        1497 mV
    AS-VDD_1V5B-zl2004        1497 mV
    AS-LU0_1V0-zl2004          998 mV
    AS-LU1_1V0-zl2004         1003 mV
    AS-MQ0_1V0-zl2004          998 mV
    AS-MQ1_1V0-zl2004          998 mV
    AS-LU2_1V0-zl2004          997 mV
    AS-LU3_1V0-zl2004         1001 mV
    AS-MQ2_1V0-zl2004          996 mV
    AS-MQ3_1V0-zl2004          994 mV
    AS-PMB_1V1-zl2006         1097 mV
  I2C Slave Revision         68
FPC 1 status:
  State                      Online
```

```
    Temperature Intake         34 degrees C / 93 degrees F
    Temperature Exhaust A      46 degrees C / 114 degrees F
    Temperature Exhaust B      54 degrees C / 129 degrees F
    Temperature LU 0 TSen      45 degrees C / 113 degrees F
    Temperature LU 0 Chip      55 degrees C / 131 degrees F
    Temperature LU 1 TSen      45 degrees C / 113 degrees F
    Temperature LU 1 Chip      44 degrees C / 111 degrees F
    Temperature LU 2 TSen      45 degrees C / 113 degrees F
    Temperature LU 2 Chip      50 degrees C / 122 degrees F
    Temperature LU 3 TSen      45 degrees C / 113 degrees F
    Temperature LU 3 Chip      58 degrees C / 136 degrees F
    Temperature XM 0 TSen      45 degrees C / 113 degrees F
    Temperature XM 0 Chip      51 degrees C / 123 degrees F
    Temperature XF 0 TSen      45 degrees C / 113 degrees F
    Temperature XF 0 Chip      63 degrees C / 145 degrees F
    Temperature PLX Switch TSen45 degrees C / 113 degrees F
    Temperature PLX Switch Chip47 degrees C / 116 degrees F
    Power
      MPC-BIAS3V3-zl2105        3300 mV
      MPC-VDD3V3-zl6100         3294 mV
      MPC-VDD2V5-zl6100         2505 mV
      MPC-VDD1V8-zl2004         1796 mV
      MPC-AVDD1V0-zl2004         991 mV
      MPC-VDD1V2-zl6100         1196 mV
      MPC-VDD1V5A-zl2004        1491 mV
      MPC-VDD1V5B-zl2004        1492 mV
      MPC-XF_0V9-zl2004          996 mV
      MPC-PCIE_1V0-zl6100       1003 mV
      MPC-LU0_1V0-zl2004         996 mV
      MPC-LU1_1V0-zl2004         996 mV
      MPC-LU2_1V0-zl2004         998 mV
      MPC-LU3_1V0-zl2004         994 mV
      MPC-12VA-BMR453          12031 mV
      MPC-12VB-BMR453          12003 mV
      MPC-PMB_1V1-zl2006        1104 mV
      MPC-PMB_1V2-zl2106        1194 mV
      MPC-XM_0V9-vt273m          911 mV
    I2C Slave Revision         110
  FPC 8 status:
    State                      Online
    Temperature Intake         32 degrees C / 89 degrees F
    Temperature Exhaust A      44 degrees C / 111 degrees F
    Temperature Exhaust B      37 degrees C / 98 degrees F
    Temperature LU 0 TCAM TSen 41 degrees C / 105 degrees F
    Temperature LU 0 TCAM Chip 49 degrees C / 120 degrees F
    Temperature LU 0 TSen      41 degrees C / 105 degrees F
    Temperature LU 0 Chip      52 degrees C / 125 degrees F
    Temperature MQ 0 TSen      41 degrees C / 105 degrees F
    Temperature MQ 0 Chip      47 degrees C / 116 degrees F
    Temperature LU 1 TCAM TSen 39 degrees C / 102 degrees F
    Temperature LU 1 TCAM Chip 42 degrees C / 107 degrees F
    Temperature LU 1 TSen      39 degrees C / 102 degrees F
    Temperature LU 1 Chip      46 degrees C / 114 degrees F
    Temperature MQ 1 TSen      39 degrees C / 102 degrees F
    Temperature MQ 1 Chip      45 degrees C / 113 degrees F
    Power
      MPC-BIAS3V3-zl2105        3296 mV
      MPC-VDD3V3-zl2006         3298 mV
      MPC-VDD2V5-zl2006         2505 mV
      MPC-TCAM_1V0-zl2004        997 mV
      MPC-AVDD1V0-zl2006        1007 mV
```



```
    MPC-VDD1V8-zl2006          1803 mV
    MPC-PCIE_1V0-zl2006        1004 mV
    MPC-LU0_1V0-zl2004         1000 mV
    MPC-MQ0_1V0-zl2004          999 mV
    MPC-VDD_1V5-zl2004         1498 mV
    MPC-PMB_1V1-zl2006         1102 mV
    MPC-9VA-BMR453             9009 mV
    MPC-9VB-BMR453             8960 mV
    MPC-PMB_1V2-zl2105         1202 mV
    MPC-LU1_1V0-zl2004         1005 mV
    MPC-MQ1_1V0-zl2004         1000 mV
  I2C Slave Revision          70
FPC 9 status:
  State                       Online
  Temperature Intake          34 degrees C / 93 degrees F
  Temperature Exhaust A       41 degrees C / 105 degrees F
  Temperature Exhaust B       54 degrees C / 129 degrees F
  Temperature LU 0 TSen       51 degrees C / 123 degrees F
  Temperature LU 0 Chip       52 degrees C / 125 degrees F
  Temperature LU 1 TSen       51 degrees C / 123 degrees F
  Temperature LU 1 Chip       55 degrees C / 131 degrees F
  Temperature LU 2 TSen       51 degrees C / 123 degrees F
  Temperature LU 2 Chip       47 degrees C / 116 degrees F
  Temperature LU 3 TSen       51 degrees C / 123 degrees F
  Temperature LU 3 Chip       47 degrees C / 116 degrees F
  Temperature MQ 0 TSen       40 degrees C / 104 degrees F
  Temperature MQ 0 Chip       42 degrees C / 107 degrees F
  Temperature MQ 1 TSen       40 degrees C / 104 degrees F
  Temperature MQ 1 Chip       44 degrees C / 111 degrees F
  Temperature MQ 2 TSen       40 degrees C / 104 degrees F
  Temperature MQ 2 Chip       38 degrees C / 100 degrees F
  Temperature MQ 3 TSen       40 degrees C / 104 degrees F
  Temperature MQ 3 Chip       40 degrees C / 104 degrees F
  Power
    AS-BIAS3V3-zl2105          3302 mV
    AS-VDD1V8-zl2006           1808 mV
    AS-VDD2V5-zl2006           2513 mV
    AS-AVDD1V0-zl2004           997 mV
    AS-PCIE_1V0-zl2004          999 mV
    AS-VDD3V3-zl2004           3294 mV
    AS-VDD_1V5A-zl2004         1503 mV
    AS-VDD_1V5B-zl2004         1502 mV
    AS-LU0_1V0-zl2004           996 mV
    AS-LU1_1V0-zl2004           999 mV
    AS-MQ0_1V0-zl2004           997 mV
    AS-MQ1_1V0-zl2004           999 mV
    AS-LU2_1V0-zl2004           997 mV
    AS-LU3_1V0-zl2004           998 mV
    AS-MQ2_1V0-zl2004          1000 mV
    AS-MQ3_1V0-zl2004          1000 mV
    AS-PMB_1V1-zl2006          1102 mV
  I2C Slave Revision          68
```

show chassis environment fpc (MX240 Router)

```
user@host> show chassis environment fpc
FPC 1 status:
  State                       Online
  Temperature Intake          34 degrees C / 93 degrees F
  Temperature Exhaust A       39 degrees C / 102 degrees F
  Temperature Exhaust B       53 degrees C / 127 degrees F
```

```
  Temperature I3 0 TSensor   51 degrees C / 123 degrees F
  Temperature I3 0 Chip      54 degrees C / 129 degrees F
  Temperature I3 1 TSensor   50 degrees C / 122 degrees F
  Temperature I3 1 Chip      53 degrees C / 127 degrees F
  Temperature I3 2 TSensor   48 degrees C / 118 degrees F
  Temperature I3 2 Chip      51 degrees C / 123 degrees F
  Temperature I3 3 TSensor   45 degrees C / 113 degrees F
  Temperature I3 3 Chip      48 degrees C / 118 degrees F
  Temperature IA 0 TSensor   45 degrees C / 113 degrees F
  Temperature IA 0 Chip      45 degrees C / 113 degrees F
  Temperature IA 1 TSensor   45 degrees C / 113 degrees F
  Temperature IA 1 Chip      49 degrees C / 120 degrees F
  Power
    1.5 V                     1492 mV
    2.5 V                     2507 mV
    3.3 V                     3306 mV
    1.8 V PFE 0               1801 mV
    1.8 V PFE 1               1804 mV
    1.8 V PFE 2               1798 mV
    1.8 V PFE 3               1798 mV
    1.2 V PFE 0               1169 mV
    1.2 V PFE 1               1189 mV
    1.2 V PFE 2               1182 mV
    1.2 V PFE 3               1176 mV
  I2C Slave Revision         42
FPC 2 status:
  State                      Online
  Temperature Intake         33 degrees C / 91 degrees F
  Temperature Exhaust A      41 degrees C / 105 degrees F
  Temperature Exhaust B      53 degrees C / 127 degrees F
  Temperature I3 0 TSensor   53 degrees C / 127 degrees F
  Temperature I3 0 Chip      58 degrees C / 136 degrees F
  Temperature I3 1 TSensor   52 degrees C / 125 degrees F
  Temperature I3 1 Chip      56 degrees C / 132 degrees F
  Temperature I3 2 TSensor   50 degrees C / 122 degrees F
  Temperature I3 2 Chip      52 degrees C / 125 degrees F
  Temperature I3 3 TSensor   46 degrees C / 114 degrees F
  Temperature I3 3 Chip      49 degrees C / 120 degrees F
  Temperature IA 0 TSensor   51 degrees C / 123 degrees F
  Temperature IA 0 Chip      49 degrees C / 120 degrees F
  Temperature IA 1 TSensor   48 degrees C / 118 degrees F
  Temperature IA 1 Chip      53 degrees C / 127 degrees F
  Power
    1.5 V                     1492 mV
    2.5 V                     2445 mV
    3.3 V                     3293 mV
    1.8 V PFE 0               1827 mV
    1.8 V PFE 1               1775 mV
    1.8 V PFE 2               1788 mV
    1.8 V PFE 3               1798 mV
    1.2 V PFE 0               1250 mV
    1.2 V PFE 1               1234 mV
    1.2 V PFE 2               1231 mV
    1.2 V PFE 3               1192 mV
  I2C Slave Revision         42
```

show chassis environment fpc (MX480 Router)

```
user@host> show chassis environment fpc
FPC 1 status:
  State                      Online
```



```
    Temperature Intake          36 degrees C / 96 degrees F
    Temperature Exhaust A       41 degrees C / 105 degrees F
    Temperature Exhaust B       55 degrees C / 131 degrees F
    Temperature I3 0 TSensor    55 degrees C / 131 degrees F
    Temperature I3 0 Chip       57 degrees C / 134 degrees F
    Temperature I3 1 TSensor    53 degrees C / 127 degrees F
    Temperature I3 1 Chip       53 degrees C / 127 degrees F
    Temperature I3 2 TSensor    52 degrees C / 125 degrees F
    Temperature I3 2 Chip       49 degrees C / 120 degrees F
    Temperature I3 3 TSensor    47 degrees C / 116 degrees F
    Temperature I3 3 Chip       47 degrees C / 116 degrees F
    Temperature IA 0 TSensor    54 degrees C / 129 degrees F
    Temperature IA 0 Chip       58 degrees C / 136 degrees F
    Temperature IA 1 TSensor    48 degrees C / 118 degrees F
    Temperature IA 1 Chip       53 degrees C / 127 degrees F
    Power
      1.5 V                      1479 mV
      2.5 V                      2542 mV
      3.3 V                      3319 mV
      1.8 V PFE 0                1811 mV
      1.8 V PFE 1                1804 mV
      1.8 V PFE 2                1804 mV
      1.8 V PFE 3                1814 mV
      1.2 V PFE 0                1192 mV
      1.2 V PFE 1                1202 mV
      1.2 V PFE 2                1205 mV
      1.2 V PFE 3                1189 mV
    I2C Slave Revision          40
```

show chassis environment fpc (MX960 Router)

```
user@host> show chassis environment fpc
FPC 5 status:
  State                       Online
  Temperature Intake          27 degrees C / 80 degrees F
  Temperature Exhaust A       34 degrees C / 93 degrees F
  Temperature Exhaust B       40 degrees C / 104 degrees F
  Temperature I3 0 TSensor    39 degrees C / 102 degrees F
  Temperature I3 0 Chip       41 degrees C / 105 degrees F
  Temperature I3 1 TSensor    38 degrees C / 100 degrees F
  Temperature I3 1 Chip       37 degrees C / 98 degrees F
  Temperature I3 2 TSensor    37 degrees C / 98 degrees F
  Temperature I3 2 Chip       34 degrees C / 93 degrees F
  Temperature I3 3 TSensor    32 degrees C / 89 degrees F
  Temperature I3 3 Chip       33 degrees C / 91 degrees F
  Temperature IA 0 TSensor    39 degrees C / 102 degrees F
  Temperature IA 0 Chip       44 degrees C / 111 degrees F
  Temperature IA 1 TSensor    36 degrees C / 96 degrees F
  Temperature IA 1 Chip       44 degrees C / 111 degrees F
  Power
    1.5 V                      1479 mV
    2.5 V                      2523 mV
    3.3 V                      3254 mV
    1.8 V PFE 0                1798 mV
    1.8 V PFE 1                1798 mV
    1.8 V PFE 2                1807 mV
    1.8 V PFE 3                1791 mV
    1.2 V PFE 0                1173 mV
    1.2 V PFE 1                1179 mV
    1.2 V PFE 2                1179 mV
    1.2 V PFE 3                1185 mV
```

```
  I2C Slave Revision         6
FPC 6 status:
  State                      Online
  Temperature Intake         25 degrees C / 77 degrees F
  Temperature Exhaust A      38 degrees C / 100 degrees F
  Temperature Exhaust B      38 degrees C / 100 degrees F
  Temperature I3 0 TSensor   40 degrees C / 104 degrees F
  Temperature I3 0 Chip      40 degrees C / 104 degrees F
  Temperature I3 1 TSensor   40 degrees C / 104 degrees F
  Temperature I3 1 Chip      38 degrees C / 100 degrees F
  Temperature I3 2 TSensor   37 degrees C / 98 degrees F
  Temperature I3 2 Chip      32 degrees C / 89 degrees F
  Temperature I3 3 TSensor   34 degrees C / 93 degrees F
  Temperature I3 3 Chip      33 degrees C / 91 degrees F
  Temperature IA 0 TSensor   45 degrees C / 113 degrees F
  Temperature IA 0 Chip      47 degrees C / 116 degrees F
  Temperature IA 1 TSensor   37 degrees C / 98 degrees F
  Temperature IA 1 Chip      42 degrees C / 107 degrees F
  Power
    1.5 V                     1485 mV
    2.5 V                     2510 mV
    3.3 V                     3332 mV
    1.8 V PFE 0               1801 mV
    1.8 V PFE 1               1814 mV
    1.8 V PFE 2               1804 mV
    1.8 V PFE 3               1820 mV
    1.2 V PFE 0               1192 mV
    1.2 V PFE 1               1189 mV
    1.2 V PFE 2               1202 mV
    1.2 V PFE 3               1156 mV
  I2C Slave Revision         40
```

show chassis environment fpc (MX480 Router with 100-Gigabit Ethernet CFP)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                      Online
  Temperature Intake         32 degrees C / 89 degrees F
  Temperature Exhaust A      39 degrees C / 102 degrees F
  Temperature Exhaust B      37 degrees C / 98 degrees F
  Temperature QX 0 TSen      44 degrees C / 111 degrees F
  Temperature QX 0 Chip      48 degrees C / 118 degrees F
  Temperature LU 0 TCAM TSen 44 degrees C / 111 degrees F
  Temperature LU 0 TCAM Chip 47 degrees C / 116 degrees F
  Temperature LU 0 TSen      44 degrees C / 111 degrees F
  Temperature LU 0 Chip      48 degrees C / 118 degrees F
  Temperature MQ 0 TSen      44 degrees C / 111 degrees F
  Temperature MQ 0 Chip      47 degrees C / 116 degrees F
  Power
    MPC-BIAS3V3-zl2105        3297 mV
    MPC-VDD3V3-zl2105         3306 mV
    MPC-VDD2V5-zl2105         2498 mV
    MPC-TCAM_1V0-zl2004        999 mV
    MPC-AVDD1V0-zl2006         999 mV
    MPC-VDD1V8-zl2006         1796 mV
    MPC-PCIE_1V0-zl2006       1002 mV
    MPC-LU0_1V0-zl2004         997 mV
    MPC-MQ0_1V0-zl2004         995 mV
    MPC-VDD_1V5-zl2004        1496 mV
    MPC-PMB_1V1-zl2006        1094 mV
    MPC-9VA-BMR453            9054 mV
```



```
    MPC-9VB-BMR453             9037 mV
    MPC-PMB_1V2-zl2106         1191 mV
    MPC-QXM0_1V0-zl2006        1000 mV
  I2C Slave Revision          66
FPC 1 status:
  State                       Online
  Temperature Intake          35 degrees C / 95 degrees F
  Temperature Exhaust A       50 degrees C / 122 degrees F
  Temperature Exhaust B       56 degrees C / 132 degrees F
  Temperature LU 0 TSen       46 degrees C / 114 degrees F
  Temperature LU 0 Chip       59 degrees C / 138 degrees F
  Temperature LU 1 TSen       46 degrees C / 114 degrees F
  Temperature LU 1 Chip       45 degrees C / 113 degrees F
  Temperature LU 2 TSen       46 degrees C / 114 degrees F
  Temperature LU 2 Chip       60 degrees C / 140 degrees F
  Temperature LU 3 TSen       46 degrees C / 114 degrees F
  Temperature LU 3 Chip       71 degrees C / 159 degrees F
  Temperature XM 0 TSen       46 degrees C / 114 degrees F
  Temperature XM 0 Chip       -18 degrees C / 0 degrees F
  Temperature XF 0 TSen       46 degrees C / 114 degrees F
  Temperature XF 0 Chip       76 degrees C / 168 degrees F
  Power
    MPC-BIAS3V3-zl2105         3292 mV
    MPC-VDD3V3-zl6100          3303 mV
    MPC-VDD2V5-zl6100          2501 mV
    MPC-VDD1V8-zl2004          1801 mV
    MPC-AVDD1V0-zl2006          996 mV
    MPC-VDD1V2-zl6100          1199 mV
    MPC-VDD1V5A-zl2004         1493 mV
    MPC-VDD1V5B-zl2004         1498 mV
    MPC-XF_0V9-zl2006           996 mV
    MPC-PCIE_1V0-zl6100        1000 mV
    MPC-LU0_1V0-zl2004          994 mV
    MPC-LU1_1V0-zl2004          994 mV
    MPC-LU2_1V0-zl2004          992 mV
    MPC-LU3_1V0-zl2004          993 mV
    MPC-12VA-BMR453           12003 mV
    MPC-12VB-BMR453           12043 mV
    MPC-PMB_1V1-zl2006         1091 mV
    MPC-PMB_1V2-zl2106         1196 mV
    MPC-XM_0V9-vt273m           899 mV
  I2C Slave Revision          106
```

show chassis environment fpc (MX240, MX480, MX960 with Application Services Modular Line Card

```
user@host>show chassis environment fpc 1
FPC 1 status:
  State                       Online
  Temperature Intake          36 degrees C / 96 degrees F
  Temperature Exhaust A       39 degrees C / 102 degrees F
  Temperature LU TSen         52 degrees C / 125 degrees F
  Temperature LU Chip         54 degrees C / 129 degrees F
  Temperature XM TSen         52 degrees C / 125 degrees F
  Temperature XM Chip         60 degrees C / 140 degrees F
  Temperature PCIe TSen       52 degrees C / 125 degrees F
  Temperature PCIe Chip       69 degrees C / 156 degrees F
  Power
    MPC-BIAS3V3-zl2106         3302 mV
    MPC-VDD3V3-zl6100          3325 mV
    MPC-AVDD1V0-zl6100         1007 mV
    MPC-PCIE_1V0-zl6100         904 mV
```

```
    MPC-LU0_1V0-zl2004         996 mV
    MPC-VDD_1V5-zl2004        1498 mV
    MPC-12VA-BMR453          11733 mV
    MPC-12VB-BMR453          11728 mV
    MPC-XM_0V9-vt273m          900 mV
  I2C Slave Revision         81
```

show chassis environment fpc (T320, T640, and T1600 Routers)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                         Online
  Temperature Top            42 degrees C / 107 degrees F
  Temperature Bottom         36 degrees C / 96 degrees F
  Temperature MMB1           39 degrees C / 102 degrees F
  Power:
    1.8 V                  1959 mV
    2.5 V                  2495 mV
    3.3 V                  3344 mV
    5.0 V                  5047 mV
    1.8 V bias             1787 mV
    3.3 V bias             3291 mV
    5.0 V bias             4998 mV
    8.0 V bias             7343 mV
  BUS Revision               40
FPC 1 status:
  State                         Online
  Temperature Top            42 degrees C / 107 degrees F
  Temperature Bottom         39 degrees C / 102 degrees F
  Temperature MMB1           40 degrees C / 104 degrees F
  Power:
    1.8 V                  1956 mV
    2.5 V                  2498 mV
    3.3 V                  3340 mV
    5.0 V                  5023 mV
    1.8 V bias             1782 mV
    3.3 V bias             3277 mV
    5.0 V bias             4989 mV
    8.0 V bias             7289 mV
  BUS Revision               40
FPC 2 status:
  State                         Online
  Temperature Top            43 degrees C / 109 degrees F
  Temperature Bottom         39 degrees C / 102 degrees F
  Temperature MMB1           41 degrees C / 105 degrees F
  Power:
    1.8 V                  1963 mV
    2.5 V                  2503 mV
    3.3 V                  3340 mV
    5.0 V                  5042 mV
    1.8 V bias             1797 mV
    3.3 V bias             3311 mV
    5.0 V bias             5013 mV
    8.0 V bias             7221 mV
  BUS Revision               40
```

show chassis environment fpc (T4000 Router)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                    Online
```



```
Fan Intake                34 degrees C / 93 degrees F
Fan Exhaust               48 degrees C / 118 degrees F
PMB                       47 degrees C / 116 degrees F
LMB0                      50 degrees C / 122 degrees F
LMB1                      41 degrees C / 105 degrees F
LMB2                      35 degrees C / 95 degrees F
PFE1 LU2                  46 degrees C / 114 degrees F
PFE1 LU0                  41 degrees C / 105 degrees F
PFE0 LU0                  57 degrees C / 134 degrees F
XF1                       47 degrees C / 116 degrees F
XF0                       52 degrees C / 125 degrees F
XM1                       41 degrees C / 105 degrees F
XM0                       50 degrees C / 122 degrees F
PFE0 LU1                  56 degrees C / 132 degrees F
PFE0 LU2                  45 degrees C / 113 degrees F
PFE1 LU1                  37 degrees C / 98 degrees F
Power 1
  1.0 V                     991 mV
  1.2 V bias               1195 mV
  1.8 V                    1788 mV
  2.5 V                    2483 mV
  3.3 V                    3289 mV
  3.3 V bias               3299 mV
  12.0 V A                10608 mV
  12.0 V B                10637 mV
Power 2
  0.9 V                     881 mV
  0.9 V PFE0                916 mV
  0.9 V PFE1                903 mV
  1.0 V PFE0               1012 mV
  1.0 V PFE1               1002 mV
  1.1 V                    1095 mV
  1.5 V_0                  1494 mV
  1.5 V_1                  1479 mV
Power 3
  1.0 V PFE0               1000 mV
  1.0 V PFE1               1002 mV
  1.0 V PFE0 *              995 mV
  1.0 V PFE1 *              995 mV
  1.8 V PFE 0              1788 mV
  1.8 V PFE 1              1789 mV
  2.5 V                    2482 mV
  12.0 V                  11614 mV
Power 4
  1.0 V PFE0 LU0           1003 mV
  1.0 V PFE1 LU0           1003 mV
  1.0 V PFE1 LU2           1004 mV
  1.0 V PFE0 LU0 *          995 mV
  1.0 V PFE1 LU0 *          998 mV
  1.0 V PFE1 LU2 *          996 mV
  12.0 V                  11643 mV
  12.0 V C                11711 mV
Power (Base/PMB/MMB)
  LMB0 VDD2V5              2488 mV
  LMB0 VDD1V8              1788 mV
  LMB0 VDD1V5              1496 mV
  LMB0 PFE0 LU0 AVDD1V0    1002 mV
  LMB0 PFE0 LU0 VDD1V0     1000 mV
  LMB0 VDD12V0            10752 mV
  LMB1 VDD2V5              2472 mV
  LMB1 VDD1V8              1792 mV
```

```
      LMB1 VDD1V5                1480 mV
      LMB1 PFE0 LU2 AVDD1V0       994 mV
      LMB1 PFE0 LU2 VDD1V0       1002 mV
      LMB1 VDD12V0              10800 mV
      LMB2 VDD2V5                2472 mV
      LMB2 VDD1V8                1792 mV
      LMB2 VDD1V5                1486 mV
      LMB2 PFE1 LU1 AVDD1V0       996 mV
      LMB2 PFE1 LU1 VDD1V0        998 mV
      LMB2 VDD12V0              10704 mV
      PMB 1.05v                  1049 mV
      PMB 1.5v                   1500 mV
      PMB 2.5v                   2500 mV
      PMB 3.3v                   3299 mV
    Bus Revision                113
  FPC 3 status:
    State                       Online
    Fan Intake                  37 degrees C / 98 degrees F
    Fan Exhaust                 51 degrees C / 123 degrees F
    PMB                         43 degrees C / 109 degrees F
    LMB0                        57 degrees C / 134 degrees F
    LMB1                        54 degrees C / 129 degrees F
    LMB2                        38 degrees C / 100 degrees F
    PFE1 LU2                    63 degrees C / 145 degrees F
    PFE1 LU0                    45 degrees C / 113 degrees F
    PFE0 LU0                    69 degrees C / 156 degrees F
    XF1                         62 degrees C / 143 degrees F
    XF0                         63 degrees C / 145 degrees F
    XM1                         43 degrees C / 109 degrees F
    XM0                         67 degrees C / 152 degrees F
    PFE0 LU1                    63 degrees C / 145 degrees F
    PFE0 LU2                    66 degrees C / 150 degrees F
    PFE1 LU1                    41 degrees C / 105 degrees F
    Power 1
      1.0 V                      1002 mV
      1.2 V bias                 1201 mV
      1.8 V                      1785 mV
      2.5 V                      2485 mV
      3.3 V                      3288 mV
      3.3 V bias                 3285 mV
      12.0 V A                  10412 mV
      12.0 V B                  10515 mV
    Power 2
      0.9 V                       882 mV
      0.9 V PFE0                  920 mV
      0.9 V PFE1                  905 mV
      1.0 V PFE0                 1015 mV
      1.0 V PFE1                 1001 mV
      1.1 V                      1094 mV
      1.5 V_0                    1495 mV
      1.5 V_1                    1478 mV
    Power 3
      0.92 V PFE1                 998 mV
      1.0 V PFE0                  997 mV
      1.0 V PFE0 *                992 mV
      1.0 V PFE1 *                991 mV
      1.8 V PFE 0                1780 mV
      1.8 V PFE 1                1797 mV
      2.5 V                      2492 mV
      12.0 V                    11604 mV
    Power 4
```

```
    1.0 V PFE0 LU0           1003 mV
    1.0 V PFE1 LU0           1004 mV
    1.0 V PFE1 LU2           1003 mV
    1.0 V PFE0 LU0 *         1000 mV
    1.0 V PFE1 LU0 *         1001 mV
    1.0 V PFE1 LU2 *         1003 mV
    12.0 V                  11653 mV
    12.0 V C                11672 mV
  Power (Base/PMB/MMB)
    LMB0 VDD2V5              2512 mV
    LMB0 VDD1V8              1790 mV
    LMB0 VDD1V5              1500 mV
    LMB0 PFE0 LU0 AVDD1V0    1004 mV
    LMB0 PFE0 LU0 VDD1V0     1002 mV
    LMB0 VDD12V0            10608 mV
    LMB1 VDD2V5              2472 mV
    LMB1 VDD1V8              1788 mV
    LMB1 VDD1V5              1480 mV
    LMB1 PFE0 LU2 AVDD1V0    1000 mV
    LMB1 PFE0 LU2 VDD1V0     1004 mV
    LMB1 VDD12V0            10672 mV
    LMB2 VDD2V5              2488 mV
    LMB2 VDD1V8              1798 mV
    LMB2 VDD1V5              1494 mV
    LMB2 PFE1 LU1 AVDD1V0    1000 mV
    LMB2 PFE1 LU1 VDD1V0     1004 mV
    LMB2 VDD12V0            10528 mV
    PMB 1.05v                1050 mV
    PMB 1.5v                 1500 mV
    PMB 2.5v                 2499 mV
    PMB 3.3v                 3299 mV
  Bus Revision              113
FPC 5 status:
  State                     Online
  Temperature Top           39 degrees C / 102 degrees F
  Temperature Bottom        38 degrees C / 100 degrees F
  Power
    1.8 V                    1804 mV
    1.8 V bias               1802 mV
    3.3 V                    3294 mV
    3.3 V bias               3277 mV
    5.0 V bias               5008 mV
    5.0 V TOP                5067 mV
    8.0 V bias               6642 mV
  Power (Base/PMB/MMB)
    1.2 V                    1202 mV
    1.5 V                    1504 mV
    5.0 V BOT                5079 mV
    12.0 V TOP Base         11848 mV
    12.0 V BOT Base         11780 mV
    1.1 V PMB                1111 mV
    1.2 V PMB                1189 mV
    1.5 V PMB                1494 mV
    1.8 V PMB                1819 mV
    2.5 V PMB                2503 mV
    3.3 V PMB                3294 mV
    5.0 V PMB                5035 mV
    12.0  V PMB             11788 mV
    0.75 MMB TOP              766 mV
    1.5 V MMB TOP            1484 mV
    1.8 V MMB TOP            1772 mV
```

```
      2.5 V MMB TOP              2485 mV
      1.2 V MMB TOP              1137 mV
      5.0 V MMB TOP              4946 mV
      12.0 V MMB TOP            11772 mV
      3.3 V MMB TOP              3289 mV
      0.75 MMB BOT                759 mV
      1.5 V MMB BOT              1482 mV
      1.8 V MMB BOT              1792 mV
      2.5 V MMB BOT              2490 mV
      1.2 V MMB BOT              1145 mV
      5.0 V MMB BOT              4922 mV
      12.0 V MMB BOT            11625 mV
      3.3 V MMB BOT              3282 mV
      APS 00                     2495 mV
      APS 01                     3308 mV
      APS 02                     3301 mV
      5.0 V PIC 0                4967 mV
      APS 10                     2512 mV
      APS 11                     3316 mV
      APS 12                     3304 mV
      5.0 V PIC 1                5081 mV
    Bus Revision                49
  FPC 6 status:
    State                       Online
    Fan Intake                  34 degrees C / 93 degrees F
    Fan Exhaust                 49 degrees C / 120 degrees F
    PMB                         40 degrees C / 104 degrees F
    LMB0                        60 degrees C / 140 degrees F
    LMB1                        58 degrees C / 136 degrees F
    LMB2                        40 degrees C / 104 degrees F
    PFE1 LU2                    69 degrees C / 156 degrees F
    PFE1 LU0                    45 degrees C / 113 degrees F
    PFE0 LU0                    71 degrees C / 159 degrees F
    XF1                         58 degrees C / 136 degrees F
    XF0                         65 degrees C / 149 degrees F
    XM1                         40 degrees C / 104 degrees F
    XM0                         66 degrees C / 150 degrees F
    PFE0 LU1                    69 degrees C / 156 degrees F
    PFE0 LU2                    68 degrees C / 154 degrees F
    PFE1 LU1                    42 degrees C / 107 degrees F
    Power 1
      1.0 V                       998 mV
      1.2 V bias                 1191 mV
      1.8 V                      1781 mV
      2.5 V                      2487 mV
      3.3 V                      3302 mV
      3.3 V bias                 3300 mV
      12.0 V A                  10388 mV
      12.0 V B                  10388 mV
    Power 2
      0.9 V                       902 mV
      0.9 V PFE0                  921 mV
      0.9 V PFE1                  907 mV
      1.0 V PFE0                  996 mV
      1.0 V PFE1                  974 mV
      1.1 V                      1095 mV
      1.5 V_0                    1495 mV
      1.5 V_1                    1478 mV
    Power 3
      1.0 V PFE0                  997 mV
      1.0 V PFE1                  998 mV
```



```
    1.0 V PFE0 *               993 mV
    1.0 V PFE1 *               991 mV
    1.8 V PFE 0               1796 mV
    1.8 V PFE 1               1789 mV
    2.5 V                     2465 mV
    12.0 V                   11609 mV
  Power 4
    1.0 V PFE0 LU0            1003 mV
    1.0 V PFE1 LU0            1006 mV
    1.0 V PFE1 LU2            1002 mV
    1.0 V PFE0 LU0 *          1000 mV
    1.0 V PFE1 LU0 *           998 mV
    1.0 V PFE1 LU2 *           998 mV
    12.0 V                   11638 mV
    12.0 V C                 11702 mV
  Power (Base/PMB/MMB)
    LMB0 VDD2V5               2484 mV
    LMB0 VDD1V8               1780 mV
    LMB0 VDD1V5               1496 mV
    LMB0 PFE0 LU0 AVDD1V0      998 mV
    LMB0 PFE0 LU0 VDD1V0      1004 mV
    LMB0 VDD12V0             10528 mV
    LMB1 VDD2V5               2472 mV
    LMB1 VDD1V8               1776 mV
    LMB1 VDD1V5               1474 mV
    LMB1 PFE0 LU2 AVDD1V0      994 mV
    LMB1 PFE0 LU2 VDD1V0      1004 mV
    LMB1 VDD12V0             10544 mV
    LMB2 VDD2V5               2476 mV
    LMB2 VDD1V8               1790 mV
    LMB2 VDD1V5               1492 mV
    LMB2 PFE1 LU1 AVDD1V0      996 mV
    LMB2 PFE1 LU1 VDD1V0      1010 mV
    LMB2 VDD12V0             10528 mV
    PMB 1.05v                 1050 mV
    PMB 1.5v                  1499 mV
    PMB 2.5v                  2500 mV
    PMB 3.3v                  3300 mV
  Bus Revision               80
```

show chassis environment fpc lcc (TX Matrix Router)

```
user@host> show chassis environment fpc lcc 0
lcc0-re0:
--------------------------------------------------------------------------
FPC 1 status:
  State                         Online
  Temperature Top            30 degrees C / 86 degrees F
  Temperature Bottom         25 degrees C / 77 degrees F
  Temperature MMB0              Absent
  Temperature MMB1           27 degrees C / 80 degrees F
  Power:
    1.8 V                    1813 mV
    2.5 V                    2504 mV
    3.3 V                    3338 mV
    5.0 V                    5037 mV
    1.8 V bias               1797 mV
    3.3 V bias               3301 mV
    5.0 V bias               5013 mV
    8.0 V bias               7345 mV
  BUS Revision                 40
```

```
FPC 2 status:
  State                             Online
  Temperature Top                37 degrees C / 98 degrees F
  Temperature Bottom             26 degrees C / 78 degrees F
  Temperature MMB0               32 degrees C / 89 degrees F
  Temperature MMB1               27 degrees C / 80 degrees F
  Power:
    1.8 V                       1791 mV
    2.5 V                       2517 mV
    3.3 V                       3308 mV
    5.0 V                       5052 mV
    1.8 V bias                  1797 mV
    3.3 V bias                  3289 mV
    5.0 V bias                  4991 mV
    8.0 V bias                  7477 mV
  BUS Revision                    40
```

show chassis environment fpc lcc (TX Matrix Plus Router)

```
user@host> show chassis environment fpc lcc 0
lcc0-re0:
--------------------------------------------------------------------------
FPC 1 status:
  State                         Online
  Temperature Top               46 degrees C / 114 degrees F
  Temperature Bottom            47 degrees C / 116 degrees F
  Power
    1.8 V                        1788 mV
    1.8 V bias                   1787 mV
    3.3 V                        3321 mV
    3.3 V bias                   3306 mV
    5.0 V bias                   5018 mV
    5.0 V TOP                    5037 mV
    8.0 V bias                   7223 mV
  Power (Base/PMB/MMB)
    1.2 V                        1205 mV
    1.5 V                        1503 mV
    5.0 V BOT                    5084 mV
    12.0 V TOP Base             11775 mV
    12.0 V BOT Base             11794 mV
    1.1 V PMB                    1108 mV
    1.2 V PMB                    1196 mV
    1.5 V PMB                    1499 mV
    1.8 V PMB                    1811 mV
    2.5 V PMB                    2515 mV
    3.3 V PMB                    3318 mV
    5.0 V PMB                    5030 mV
    12.0  V PMB                 11832 mV
    0.75 MMB TOP                  752 mV
    1.5 V MMB TOP                1489 mV
    1.8 V MMB TOP                1782 mV
    2.5 V MMB TOP                2498 mV
    1.2 V MMB TOP                1155 mV
    5.0 V MMB TOP                4902 mV
    12.0 V MMB TOP              11721 mV
    3.3 V MMB TOP                3316 mV
    0.75 MMB BOT                  754 mV
    1.5 V MMB BOT                1482 mV
    1.8 V MMB BOT                1758 mV
    2.5 V MMB BOT                2488 mV
    1.2 V MMB BOT                1157 mV
```



```
    5.0 V MMB BOT              4962 mV
    12.0 V MMB BOT            11691 mV
    3.3 V MMB BOT              3308 mV
    APS 00                     1484 mV
    APS 01                     2503 mV
    APS 02                     3313 mV
    5.0 V PIC 0                5025 mV
    APS 10                     1501 mV
    APS 11                     2466 mV
    APS 12                     3311 mV
    5.0 V PIC 1                5081 mV
  Bus Revision                49
```

show chassis environment fpc (QFX Series and OCX Series)

```
user@switch> show chassis environment fpc 0
FPC 0 status:
  State                       Online
  Temperature                 42 degrees C / 107 degrees F
```

show chassis environment fpc interconnect-device (QFabric Systems)

```
user@switch> show chassis environment fpc interconnect-device interconnect1 0
FC 0 FPC 0 status:
  State                       Online
  Left Intake Temperature     24 degrees C / 75 degrees F
  Right Intake Temperature    24 degrees C / 75 degrees F
  Left Exhaust Temperature    27 degrees C / 80 degrees F
  Right Exhaust Temperature   27 degrees C / 80 degrees F
  Power
    BIAS 3V3                   3330 mV
    VDD 3V3                    3300 mV
    VDD 2V5                    2502 mV
    VDD 1V5                    1496 mV
    VDD 1V2                    1194 mV
    VDD 1V0                    1000 mV
    SW0 VDD  1V0               1020 mV
    SW0 CVDD 1V025             1032 mV
    SW1 VDD  1V0               1022 mV
    SW1 CVDD 1V025             1030 mV
    VDD 12V0 DIV3_33           3414 mV
```

show chassis environment fpc 0 (PTX5000 Packet Transport Router)

```
user@host> show chassis environment fpc 0
FPC 0 status:
  State                       Online
  PMB Temperature             35 degrees C / 95 degrees F
  Intake Temperature          33 degrees C / 91 degrees F
  Exhaust A Temperature       51 degrees C / 123 degrees F
  Exhaust B Temperature       43 degrees C / 109 degrees F
  TL0 Temperature             48 degrees C / 118 degrees F
  TQ0 Temperature             53 degrees C / 127 degrees F
  TL1 Temperature             56 degrees C / 132 degrees F
  TQ1 Temperature             58 degrees C / 136 degrees F
  TL2 Temperature             55 degrees C / 131 degrees F
  TQ2 Temperature             57 degrees C / 134 degrees F
  TL3 Temperature             59 degrees C / 138 degrees F
  TQ3 Temperature             59 degrees C / 138 degrees F
  Power
    PMB   1.05v                1049 mV
    PMB   1.5v                 1500 mV
```

```
  PMB   2.5v                2500 mV
  PMB   3.3v                3299 mV
  PFE0  1.5v                1500 mV
  PFE0  1.0v                 999 mV
  TQ0   0.9v                 900 mV
  TL0   0.9v                 900 mV
  PFE1  1.5v                1499 mV
  PFE1  1.0v                 999 mV
  TQ1   0.9v                 899 mV
  TL1   0.9v                 900 mV
  PFE2  1.5v                1500 mV
  PFE2  1.0v                1000 mV
  TQ2   0.9v                 900 mV
  TL2   0.9v                 900 mV
  PFE3  1.5v                1499 mV
  PFE3  1.0v                1000 mV
  TQ3   0.9v                 900 mV
  TL3   0.9v                 900 mV
  Bias  3.3v                3327 mV
  FPC   3.3v                3300 mV
  FPC   2.5v                2500 mV
  SAM   0.9v                 900 mV
  A    12.0v                2014 mV
  B    12.0v                2030 mV
```

show chassis environment fpc 07 (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis environment fpc 07
FPC 7 status:
  State                      Online
  PMB TEMP0 Temperature      32 degrees C / 89 degrees F
  PMB TEMP1 Temperature      28 degrees C / 82 degrees F
  PMB CPU Temperature        46 degrees C / 114 degrees F
  Intake Temperature         35 degrees C / 95 degrees F
  Exhaust A Temperature      55 degrees C / 131 degrees F
  Exhaust B Temperature      54 degrees C / 129 degrees F
  TL5 Temperature            59 degrees C / 138 degrees F
  TQ5 Temperature            57 degrees C / 134 degrees F
  TL6 Temperature            57 degrees C / 134 degrees F
  TQ6 Temperature            51 degrees C / 123 degrees F
  TL1 Temperature            76 degrees C / 168 degrees F
  TQ1 Temperature            58 degrees C / 136 degrees F
  TL2 Temperature            75 degrees C / 167 degrees F
  TQ2 Temperature            57 degrees C / 134 degrees F
  TL4 Temperature            52 degrees C / 125 degrees F
  TQ4 Temperature            66 degrees C / 150 degrees F
  TL7 Temperature            52 degrees C / 125 degrees F
  TQ7 Temperature            60 degrees C / 140 degrees F
  TL0 Temperature            72 degrees C / 161 degrees F
  TQ0 Temperature            73 degrees C / 163 degrees F
  TL3 Temperature            64 degrees C / 147 degrees F
  TQ3 Temperature            70 degrees C / 158 degrees F
  Power
    PMB   1.05v               1049 mV
    PMB   3.3v                3299 mV
    PMB   1.1v-a              1100 mV
    PMB   1.5v                1499 mV
    PMB   1.1v-b              1100 mV
    Base  3.3v                3300 mV
    FPC Base  2.5v            2499 mV
    TL1   0.9v                 897 mV
```



```
    TQ1   0.9v                897 mV
    PFE1  1.0v                999 mV
    PFE1  1.5v               1499 mV
    TL2   0.9v                897 mV
    TQ2   0.9v                897 mV
    PFE2  1.0v                999 mV
    PFE2  1.5v               1499 mV
    FPC Base  1.0v           1000 mV
    FPC Base  1.2v           1199 mV
    TL5   0.9v                898 mV
    TQ5   0.9v                898 mV
    PFE5  1.0v               1000 mV
    PFE5  1.5v               1500 mV
    TL6   0.9v                897 mV
    TQ6   0.9v                897 mV
    PFE6  1.0v               1000 mV
    PFE6  1.5v               1499 mV
    Mezz Base  2.5v          2500 mV
    TL0   0.9v                896 mV
    TQ0   0.9v                896 mV
    PFE0  1.0v                999 mV
    PFE0  1.5v               1499 mV
```

show chassis environment FPC 1 (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis environment fpc 1
FPC 1 status:
  State                      Online
  Temperature Intake         36 degrees C / 96 degrees F
  Temperature Exhaust A      39 degrees C / 102 degrees F
  Temperature LU TSen        52 degrees C / 125 degrees F
  Temperature LU Chip        54 degrees C / 129 degrees F
  Temperature XM TSen        52 degrees C / 125 degrees F
  Temperature XM Chip        60 degrees C / 140 degrees F
  Temperature PCIe TSen      52 degrees C / 125 degrees F
  Temperature PCIe Chip      69 degrees C / 156 degrees F
  Power
    MPC-BIAS3V3-zl2106        3302 mV
    MPC-VDD3V3-zl6100         3325 mV
    MPC-AVDD1V0-zl6100        1007 mV
    MPC-PCIE_1V0-zl6100        904 mV
    MPC-LU0_1V0-zl2004         996 mV
    MPC-VDD_1V5-zl2004        1498 mV
    MPC-12VA-BMR453          11733 mV
    MPC-12VB-BMR453          11728 mV
    MPC-XM_0V9-vt273m          900 mV
  I2C Slave Revision         81
```

show chassis environment fpm

List of Syntax

Syntax on page 840
Syntax (TX Matrix Routers) on page 840
Syntax (TX Matrix Plus Routers) on page 840

Syntax

show chassis environment fpm

Syntax (TX Matrix Routers)

show chassis environment fpm
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis environment fpm
<lcc *number* | sfc *number*>

Release Information

Command introduced before Junos OS Release 7.4.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.1 for T4000 Core Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

(M40e, M120, M160, M320, MX Series, and T Series routers and the PTX Series Packet Transport Routers only) Display environmental information about the front panel module in the router.

Options

none—(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, display environmental information about the front panel modules (craft interfaces) on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about the front panel modules (craft interfaces) on the TX Matrix Plus router and its attached routers.

lcc ***number***——(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc—(TX Matrix router only) (Optional) Display environmental information about the front panel module (craft interface) on the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus router only) (Optional) Display environmental information about the front panel module (craft interface) on the TX Matrix Plus router (or switch-fabric chassis).

Required Privilege Level view

Related Documentation

- request chassis fpm resync on page 635

List of Sample Output

Output Fields Table 51 on page 841 lists the output fields for the **show chassis environment fpm** command. Output fields are listed in the approximate order in which they appear.

Table 51: show chassis environment fpm Output Fields

Field Name	Field Description
State	FPM status: • **Online**—FPM is online and running. • **Offline**—FPM is powered down.
FPM CMB Voltage	(M40e and M160 routers only) Information about the voltage supplied to the FPM chassis management bus (CMB) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
FPM GBUS Voltage	(M320 and T Series routers only) Information about the voltage supplied to the FPM generic bus (GBUS) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
FPM I2CS Voltage	(PTX Series only) Information about the voltage supplied to the FPM generic bus (I2CS) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
FPM Display Voltage	Information about the voltage supplied to the FPM display. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
FPM CMB Temperature	(M40e and M160 routers only) Temperature of the air flowing past the FPM CMB device

Table 51: show chassis environment fpm Output Fields *(continued)*

Field Name	Field Description
FPM GBUS Temperature	(M320 and T Series routers only) Temperature of the air flowing past the FPM GBUS device.
FPM I2CS Temperature	(PTX Series only) Temperature of the air flowing past the FPM I2CS device.
FPM Display Temperature	Temperature of the air flowing past the FPM display.
CMB Revision	(M40e and M160 routers only) Revision level of the CMB device.
GBUS Revision	(M320 and T Series routers only) Revision level of the GBUS device.
I2CS Revision	(MX2010 routers, MX2020 routers, and PTX Series only) Revision level of the I2CS device.

Sample Output

show chassis environment fpm (M40e and M160 Routers)

```
user@host> show chassis environment fpm
FPM status:
  State                          Online
  FPM CMB Voltage:
    5.0 V bias              5030 mV
    8.0 V bias              8083 mV
  FPM Display Voltage:
    5.0 V bias              4998 mV
  FPM CMB temperature         34 degrees C / 93 degrees F
  FPM Display temperature     35 degrees C / 95 degrees F
  CMB Revision                12
```

show chassis environment fpm (M320 Router)

```
user@host> show chassis environment fpm
FPM status:
  State                              Online
  FPM GBUS Voltage:
    5.0 V                       5006 mV
    1.8 V bias                  1799 mV
    3.3 V bias                  3294 mV
    5.0 V bias                  4998 mV
    8.0 V bias                  7682 mV
  FPM GBUS temperature            30 degrees C / 86 degrees F
  GBUS Revision                   51
```

show chassis environment fpm (MX2010 Router)

```
user@host > show chassis environment fpm
FPM status:
  State                         Online
  I2CS Revision                 4
```

show chassis environment fpm (MX2020 Router)

```
user@host > show chassis environment fpm
FPM status:
  State                         Online
  I2CS Revision                 3
```

show chassis environment fpm (MX240 Router)

```
user@host> show chassis environment fpm
FPM status:
  State                         Online
  I2CS Revision                 41
```

show chassis environment fpm (MX480 Router)

```
user@host> show chassis environment fpm
FPM status:
  State                         Online
  I2CS Revision                 41
```

show chassis environment fpm (T Series Routers)

```
user@host> show chassis environment fpm
FPM status:
  State                              Online
  FPM GBUS Voltage:
    1.8 V bias                  1787 mV
    3.3 V bias                  3286 mV
    5.0 V bias                  4991 mV
    8.0 V bias                  7162 mV
  FPM Display Voltage:
    5.0 V                       4996 mV
  FPM GBUS temperature            29 degrees C / 84 degrees F
  FPM Display temperature         26 degrees C / 78 degrees F
  GBUS Revision                   37
```

show chassis environment fpm lcc (TX Matrix Router)

```
user@host> show chassis environment fpm lcc 0
lcc0-re0:
--------------------------------------------------------------------------
FPM status:
  State                              Online
  FPM GBUS Voltage:
    1.8 V bias                  1797 mV
    3.3 V bias                  3294 mV
    5.0 V bias                  5015 mV
    8.0 V bias                  7470 mV
  FPM Display Voltage:
    5.0 V                       5018 mV
  FPM GBUS temperature            25 degrees C / 77 degrees F
  FPM Display temperature         29 degrees C / 84 degrees F
  GBUS Revision                   37
```

show chassis environment fpm scc (TX Matrix Router)

```
user@host> show chassis environment fpm scc
scc-re0:
--------------------------------------------------------------------------
FPM status:
```

```
  State                           Online
  FPM GBUS Voltage:
    1.8 V bias                 1789 mV
    3.3 V bias                 3296 mV
    5.0 V bias                 5003 mV
    8.0 V bias                 7592 mV
  FPM Display Voltage:
    5.0 V                      5010 mV
  FPM GBUS temperature           22 degrees C / 71 degrees F
  FPM Display temperature        27 degrees C / 80 degrees F
  GBUS Revision                  37
```

show chassis environment fpm sfc (TX Matrix Plus Router)

```
user@host> show chassis environment fpm sfc

sfc0-re0:
--------------------------------------------------------------------------
FPM status:
  State                      Online
  FPM I2CS Voltage:
    3.3 V                     3300 mV
    5.0 V                     5001 mV
    9.0 V FPD                 8672 mV
  FPM I2CS temperature       33 degrees C / 91 degrees F
  I2CS Revision              69

lcc0-re0:
--------------------------------------------------------------------------
FPM status:
  State                      Online
  FPM GBUS Voltage:
    1.8 V bias                1802 mV
    3.3 V bias                3301 mV
    5.0 V bias                4984 mV
    8.0 V bias                7377 mV
  FPM Display Voltage:
    5.0 V                     5015 mV
  FPM GBUS temperature       30 degrees C / 86 degrees F
  FPM Display temperature    32 degrees C / 89 degrees F
  GBUS Revision              37

lcc1-re0:
--------------------------------------------------------------------------
FPM status:
  State                      Online
  FPM GBUS Voltage:
    1.8 V bias                1789 mV
    3.3 V bias                3311 mV
    5.0 V bias                5013 mV
    8.0 V bias                7467 mV
  FPM Display Voltage:
    5.0 V                     5015 mV
  FPM GBUS temperature       29 degrees C / 84 degrees F
  FPM Display temperature    31 degrees C / 87 degrees F
  GBUS Revision              37
```

show chassis environment fpm (T4000 Core Router)

```
user@host> show chassis environment fpm
```



```
CB 0 status:
  State                       Online Master
  Temperature                 34 degrees C / 93 degrees F
  Power 1
    1.8 V                      1804 mV
    2.5 V                      2499 mV
    3.3 V                      3317 mV
    3.3 V bias                 3291 mV
    4.6 V                      4663 mV
    5.0 V                      4905 mV
    8.0 V bias                 7658 mV
    12.0 V                    11877 mV
  Power 2
    1.0 V                       996 mV
    1.2 V                      1207 mV
    3.3 V RE                   3354 mV
  Bus Revision                51
  FPGA Revision               5
CB 1 status:
  State                       Online Standby
  Temperature                 36 degrees C / 96 degrees F
  Power 1
    1.8 V                      1791 mV
    2.5 V                      2494 mV
    3.3 V                      3321 mV
    3.3 V bias                 3301 mV
    4.6 V                      4666 mV
    5.0 V                      4945 mV
    8.0 V bias                 7645 mV
    12.0 V                    11897 mV
  Power 2
    1.0 V                       991 mV
    1.2 V                      1201 mV
    3.3 V RE                   3289 mV
  Bus Revision                51
  FPGA Revision               5

user@host> show chassis environment fpm
FPM status:
  State                       Online
  FPM GBUS Voltage:
    1.8 V bias                 1802 mV
    3.3 V bias                 3294 mV
    5.0 V bias                 5003 mV
    8.0 V bias                 7306 mV
  FPM Display Voltage:
    5.0 V                      5010 mV
  FPM GBUS temperature        26 degrees C / 78 degrees F
  FPM Display temperature     29 degrees C / 84 degrees F
  GBUS Revision               37
```

show chassis environment fpm (PTX5000 Packet Transport Router)

```
user@host> show chassis environment fpm

FPM status:
  State                       Online
  FPM I2CS Voltage:
    3.3 V                      3300 mV
    5.0 V                      4975 mV
```

```
FPM I2CS temperature       37 degrees C / 98 degrees F
I2CS Revision              109
```

show chassis environment monitored

Syntax show chassis environment monitored

Release Information Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description (PTX Series Packet Transport Routers, and MX2010 and MX2020 routers) Display status information for monitored temperatures.

On the PTX Series Packet Transport Routers, and on MX2010 and MX2020 routers, you can configure which temperatures are monitored for computing temperature alarms. Use this command to display only the temperatures that are monitored. Temperatures that are not included in the temperature alarm computations are not displayed.

Options This command has no options.

Required Privilege Level view

Related Documentation

- show chassis environment on page 719
- *Chassis-Level Feature Guide*

List of Sample Output

show chassis environment monitored (PTX5000 Packet Transport Router) on page 847
show chassis environment monitored (MX2010 Router) on page 848
show chassis environment monitored (MX2020 Router) on page 850

Output Fields Table 52 on page 847 lists the output fields for the **show chassis environment monitored** command. Output fields are listed in the approximate order in which they appear.

Table 52: show chassis environment monitored Output Fields

Field Name	Field Description
Item	Chassis component: • (PTX Series Packet Transport Routers, and MX2010 and MX2020 routers)—Information about the chassis, Routing Engines, Control Boards (CBs), Switch Interface Boards (SIBs), PICs, and Flexible PIC Concentrators (FPCs).
Status	Status of the specified item. Status can be **OK** or **Alarm**.
Measurement	Temperature of the air flowing past the specified chassis component. Temperature is displayed in degrees Celsius (C) and degrees Fahrenheit (F).

Sample Output

show chassis environment monitored (PTX5000 Packet Transport Router)

`user@host>` **show chassis environment monitored**

```
Class Item                          Status     Measurement
      Routing Engine 0 CPU          OK         71 degrees C / 159 degrees F
      Routing Engine 1 CPU          OK         62 degrees C / 143 degrees F
      CB 0 Exhaust A                OK         45 degrees C / 113 degrees F
      CB 0 Exhaust B                OK         41 degrees C / 105 degrees F
      CB 1 Exhaust A                OK         39 degrees C / 102 degrees F
      CB 1 Exhaust B                OK         36 degrees C / 96 degrees F
```

show chassis environment monitored (MX2010 Router)

```
user@host > show chassis environment monitored
Class Item                          Status     Measurement
Temp  CB 0 IntakeA-Zone0            OK         37 degrees C / 98 degrees F
      CB 0 IntakeB-Zone1            OK         31 degrees C / 87 degrees F
      CB 0 IntakeC-Zone0            OK         39 degrees C / 102 degrees F
      CB 0 ExhaustA-Zone0           OK         36 degrees C / 96 degrees F
      CB 0 ExhaustB-Zone1           OK         32 degrees C / 89 degrees F
      CB 0 TCBC-Zone0               OK         34 degrees C / 93 degrees F
      CB 1 IntakeA-Zone0            OK         36 degrees C / 96 degrees F
      CB 1 IntakeB-Zone1            OK         28 degrees C / 82 degrees F
      CB 1 IntakeC-Zone0            OK         38 degrees C / 100 degrees F
      CB 1 ExhaustA-Zone0           OK         36 degrees C / 96 degrees F
      CB 1 ExhaustB-Zone1           OK         30 degrees C / 86 degrees F
      CB 1 TCBC-Zone0               OK         33 degrees C / 91 degrees F
      SPMB 0 Intake                 OK         30 degrees C / 86 degrees F
      SPMB 1 Intake                 OK         28 degrees C / 82 degrees F
      Routing Engine 0 CPU          OK         32 degrees C / 89 degrees F
      Routing Engine 1 CPU          Present
      SFB 0 Intake-Zone0            OK         46 degrees C / 114 degrees F
      SFB 0 Exhaust-Zone1           OK         38 degrees C / 100 degrees F
      SFB 0 IntakeA-Zone0           OK         35 degrees C / 95 degrees F
      SFB 0 IntakeB-Zone1           OK         31 degrees C / 87 degrees F
      SFB 0 Exhaust-Zone0           OK         39 degrees C / 102 degrees F
      SFB 0 SFB-XF2-Zone1           OK         44 degrees C / 111 degrees F
      SFB 0 SFB-XF1-Zone0           OK         47 degrees C / 116 degrees F
      SFB 0 SFB-XF0-Zone0           OK         56 degrees C / 132 degrees F
      SFB 1 Intake-Zone0            OK         34 degrees C / 93 degrees F
      SFB 1 Exhaust-Zone1           OK         34 degrees C / 93 degrees F
      SFB 1 IntakeA-Zone0           OK         29 degrees C / 84 degrees F
      SFB 1 IntakeB-Zone1           OK         29 degrees C / 84 degrees F
      SFB 1 Exhaust-Zone0           OK         32 degrees C / 89 degrees F
      SFB 1 SFB-XF2-Zone1           OK         42 degrees C / 107 degrees F
      SFB 1 SFB-XF1-Zone0           OK         40 degrees C / 104 degrees F
      SFB 1 SFB-XF0-Zone0           OK         42 degrees C / 107 degrees F
      SFB 2 Intake-Zone0            OK         33 degrees C / 91 degrees F
      SFB 2 Exhaust-Zone1           OK         33 degrees C / 91 degrees F
      SFB 2 IntakeA-Zone0           OK         28 degrees C / 82 degrees F
      SFB 2 IntakeB-Zone1           OK         28 degrees C / 82 degrees F
      SFB 2 Exhaust-Zone0           OK         31 degrees C / 87 degrees F
      SFB 2 SFB-XF2-Zone1           OK         41 degrees C / 105 degrees F
      SFB 2 SFB-XF1-Zone0           OK         39 degrees C / 102 degrees F
      SFB 2 SFB-XF0-Zone0           OK         42 degrees C / 107 degrees F
      SFB 3 Intake-Zone0            OK         33 degrees C / 91 degrees F
      SFB 3 Exhaust-Zone1           OK         33 degrees C / 91 degrees F
      SFB 3 IntakeA-Zone0           OK         29 degrees C / 84 degrees F
      SFB 3 IntakeB-Zone1           OK         28 degrees C / 82 degrees F
      SFB 3 Exhaust-Zone0           OK         31 degrees C / 87 degrees F
      SFB 3 SFB-XF2-Zone1           OK         43 degrees C / 109 degrees F
      SFB 3 SFB-XF1-Zone0           OK         40 degrees C / 104 degrees F
      SFB 3 SFB-XF0-Zone0           OK         42 degrees C / 107 degrees F
```



```
SFB 4 Intake-Zone0           OK         34 degrees C / 93 degrees F
SFB 4 Exhaust-Zone1          OK         34 degrees C / 93 degrees F
SFB 4 IntakeA-Zone0          OK         29 degrees C / 84 degrees F
SFB 4 IntakeB-Zone1          OK         28 degrees C / 82 degrees F
SFB 4 Exhaust-Zone0          OK         32 degrees C / 89 degrees F
SFB 4 SFB-XF2-Zone1          OK         43 degrees C / 109 degrees F
SFB 4 SFB-XF1-Zone0          OK         42 degrees C / 107 degrees F
SFB 4 SFB-XF0-Zone0          OK         43 degrees C / 109 degrees F
SFB 5 Intake-Zone0           OK         34 degrees C / 93 degrees F
SFB 5 Exhaust-Zone1          OK         34 degrees C / 93 degrees F
SFB 5 IntakeA-Zone0          OK         30 degrees C / 86 degrees F
SFB 5 IntakeB-Zone1          OK         28 degrees C / 82 degrees F
SFB 5 Exhaust-Zone0          OK         32 degrees C / 89 degrees F
SFB 5 SFB-XF2-Zone1          OK         41 degrees C / 105 degrees F
SFB 5 SFB-XF1-Zone0          OK         41 degrees C / 105 degrees F
SFB 5 SFB-XF0-Zone0          OK         44 degrees C / 111 degrees F
SFB 6 Intake-Zone0           OK         35 degrees C / 95 degrees F
SFB 6 Exhaust-Zone1          OK         34 degrees C / 93 degrees F
SFB 6 IntakeA-Zone0          OK         30 degrees C / 86 degrees F
SFB 6 IntakeB-Zone1          OK         29 degrees C / 84 degrees F
SFB 6 Exhaust-Zone0          OK         33 degrees C / 91 degrees F
SFB 6 SFB-XF2-Zone1          OK         44 degrees C / 111 degrees F
SFB 6 SFB-XF1-Zone0          OK         43 degrees C / 109 degrees F
SFB 6 SFB-XF0-Zone0          OK         46 degrees C / 114 degrees F
SFB 7 Intake-Zone0           OK         39 degrees C / 102 degrees F
SFB 7 Exhaust-Zone1          OK         34 degrees C / 93 degrees F
SFB 7 IntakeA-Zone0          OK         34 degrees C / 93 degrees F
SFB 7 IntakeB-Zone1          OK         29 degrees C / 84 degrees F
SFB 7 Exhaust-Zone0          OK         37 degrees C / 98 degrees F
SFB 7 SFB-XF2-Zone1          OK         43 degrees C / 109 degrees F
SFB 7 SFB-XF1-Zone0          OK         47 degrees C / 116 degrees F
SFB 7 SFB-XF0-Zone0          OK         52 degrees C / 125 degrees F
FPC 0 Intake                 OK         36 degrees C / 96 degrees F
FPC 0 Exhaust A              OK         42 degrees C / 107 degrees F
FPC 0 Exhaust B              OK         51 degrees C / 123 degrees F
FPC 0 LU 0 TSen              OK         49 degrees C / 120 degrees F
FPC 0 LU 0 Chip              OK         50 degrees C / 122 degrees F
FPC 0 LU 1 TSen              OK         49 degrees C / 120 degrees F
FPC 0 LU 1 Chip              OK         54 degrees C / 129 degrees F
FPC 0 LU 2 TSen              OK         49 degrees C / 120 degrees F
FPC 0 LU 2 Chip              OK         45 degrees C / 113 degrees F
FPC 0 LU 3 TSen              OK         49 degrees C / 120 degrees F
FPC 0 LU 3 Chip              OK         46 degrees C / 114 degrees F
FPC 0 MQ 0 TSen              OK         40 degrees C / 104 degrees F
FPC 0 MQ 0 Chip              OK         41 degrees C / 105 degrees F
FPC 0 MQ 1 TSen              OK         40 degrees C / 104 degrees F
FPC 0 MQ 1 Chip              OK         44 degrees C / 111 degrees F
FPC 0 MQ 2 TSen              OK         40 degrees C / 104 degrees F
FPC 0 MQ 2 Chip              OK         38 degrees C / 100 degrees F
FPC 0 MQ 3 TSen              OK         40 degrees C / 104 degrees F
FPC 0 MQ 3 Chip              OK         41 degrees C / 105 degrees F
FPC 1 Intake                 OK         34 degrees C / 93 degrees F
FPC 1 Exhaust A              OK         46 degrees C / 114 degrees F
FPC 1 Exhaust B              OK         54 degrees C / 129 degrees F
FPC 1 LU 0 TSen              OK         45 degrees C / 113 degrees F
FPC 1 LU 0 Chip              OK         55 degrees C / 131 degrees F
FPC 1 LU 1 TSen              OK         45 degrees C / 113 degrees F
FPC 1 LU 1 Chip              OK         44 degrees C / 111 degrees F
FPC 1 LU 2 TSen              OK         45 degrees C / 113 degrees F
FPC 1 LU 2 Chip              OK         50 degrees C / 122 degrees F
FPC 1 LU 3 TSen              OK         45 degrees C / 113 degrees F
```

```
FPC 1 LU 3 Chip              OK          58 degrees C / 136 degrees F
FPC 1 XM 0 TSen              OK          45 degrees C / 113 degrees F
FPC 1 XM 0 Chip              OK          52 degrees C / 125 degrees F
FPC 1 XF 0 TSen              OK          45 degrees C / 113 degrees F
FPC 1 XF 0 Chip              OK          63 degrees C / 145 degrees F
FPC 1 PLX Switch TSen        OK          45 degrees C / 113 degrees F
FPC 1 PLX Switch Chip        OK          47 degrees C / 116 degrees F
FPC 8 Intake                 OK          32 degrees C / 89 degrees F
FPC 8 Exhaust A              OK          44 degrees C / 111 degrees F
FPC 8 Exhaust B              OK          37 degrees C / 98 degrees F
FPC 8 LU 0 TCAM TSen         OK          41 degrees C / 105 degrees F
FPC 8 LU 0 TCAM Chip         OK          49 degrees C / 120 degrees F
FPC 8 LU 0 TSen              OK          41 degrees C / 105 degrees F
FPC 8 LU 0 Chip              OK          52 degrees C / 125 degrees F
FPC 8 MQ 0 TSen              OK          41 degrees C / 105 degrees F
FPC 8 MQ 0 Chip              OK          47 degrees C / 116 degrees F
FPC 8 LU 1 TCAM TSen         OK          39 degrees C / 102 degrees F
FPC 8 LU 1 TCAM Chip         OK          42 degrees C / 107 degrees F
FPC 8 LU 1 TSen              OK          39 degrees C / 102 degrees F
FPC 8 LU 1 Chip              OK          46 degrees C / 114 degrees F
FPC 8 MQ 1 TSen              OK          39 degrees C / 102 degrees F
FPC 8 MQ 1 Chip              OK          45 degrees C / 113 degrees F
FPC 9 Intake                 OK          34 degrees C / 93 degrees F
FPC 9 Exhaust A              OK          41 degrees C / 105 degrees F
FPC 9 Exhaust B              OK          54 degrees C / 129 degrees F
FPC 9 LU 0 TSen              OK          51 degrees C / 123 degrees F
FPC 9 LU 0 Chip              OK          52 degrees C / 125 degrees F
FPC 9 LU 1 TSen              OK          51 degrees C / 123 degrees F
FPC 9 LU 1 Chip              OK          55 degrees C / 131 degrees F
FPC 9 LU 2 TSen              OK          51 degrees C / 123 degrees F
FPC 9 LU 2 Chip              OK          47 degrees C / 116 degrees F
FPC 9 LU 3 TSen              OK          51 degrees C / 123 degrees F
FPC 9 LU 3 Chip              OK          47 degrees C / 116 degrees F
FPC 9 MQ 0 TSen              OK          40 degrees C / 104 degrees F
FPC 9 MQ 0 Chip              OK          42 degrees C / 107 degrees F
FPC 9 MQ 1 TSen              OK          40 degrees C / 104 degrees F
FPC 9 MQ 1 Chip              OK          44 degrees C / 111 degrees F
FPC 9 MQ 2 TSen              OK          40 degrees C / 104 degrees F
FPC 9 MQ 2 Chip              OK          38 degrees C / 100 degrees F
FPC 9 MQ 3 TSen              OK          40 degrees C / 104 degrees F
FPC 9 MQ 3 Chip              OK          40 degrees C / 104 degrees F
ADC 0 Intake                 OK          35 degrees C / 95 degrees F
ADC 0 Exhaust                OK          44 degrees C / 111 degrees F
ADC 0 ADC-XF1                OK          48 degrees C / 118 degrees F
ADC 0 ADC-XF0                OK          59 degrees C / 138 degrees F
ADC 1 Intake                 OK          34 degrees C / 93 degrees F
ADC 1 Exhaust                OK          45 degrees C / 113 degrees F
ADC 1 ADC-XF1                OK          53 degrees C / 127 degrees F
ADC 1 ADC-XF0                OK          56 degrees C / 132 degrees F
ADC 8 Intake                 OK          35 degrees C / 95 degrees F
ADC 8 Exhaust                OK          41 degrees C / 105 degrees F
ADC 8 ADC-XF1                OK          52 degrees C / 125 degrees F
ADC 8 ADC-XF0                OK          55 degrees C / 131 degrees F
ADC 9 Intake                 OK          33 degrees C / 91 degrees F
ADC 9 Exhaust                OK          42 degrees C / 107 degrees F
ADC 9 ADC-XF1                OK          55 degrees C / 131 degrees F
ADC 9 ADC-XF0                OK          56 degrees C / 132 degrees F
```

show chassis environment monitored (MX2020 Router)

`user@host >` **show chassis environment monitored**


```
Class Item                         Status     Measurement
Temp  CB 0 IntakeA-Zone0           OK         44 degrees C / 111 degrees F
      CB 0 IntakeB-Zone1           OK         34 degrees C / 93 degrees F
      CB 0 IntakeC-Zone0           OK         46 degrees C / 114 degrees F
      CB 0 ExhaustA-Zone0          OK         44 degrees C / 111 degrees F
      CB 0 ExhaustB-Zone1          OK         36 degrees C / 96 degrees F
      CB 0 TCBC-Zone0              OK         39 degrees C / 102 degrees F
      CB 1 IntakeA-Zone0           OK         46 degrees C / 114 degrees F
      CB 1 IntakeB-Zone1           OK         43 degrees C / 109 degrees F
      CB 1 IntakeC-Zone0           OK         47 degrees C / 116 degrees F
      CB 1 ExhaustA-Zone0          OK         45 degrees C / 113 degrees F
      CB 1 ExhaustB-Zone1          OK         42 degrees C / 107 degrees F
      CB 1 TCBC-Zone0              OK         46 degrees C / 114 degrees F
      SPMB 0 Intake                OK         33 degrees C / 91 degrees F
      SPMB 1 Intake                OK         43 degrees C / 109 degrees F
      Routing Engine 0 CPU         OK         34 degrees C / 93 degrees F
      Routing Engine 1 CPU         OK         42 degrees C / 107 degrees F
      SFB 0 Intake-Zone0           OK         52 degrees C / 125 degrees F
      SFB 0 Exhaust-Zone1          OK         45 degrees C / 113 degrees F
      SFB 0 IntakeA-Zone0          OK         47 degrees C / 116 degrees F
      SFB 0 IntakeB-Zone1          OK         38 degrees C / 100 degrees F
      SFB 0 Exhaust-Zone0          OK         49 degrees C / 120 degrees F
      SFB 0 SFB-XF2-Zone1          OK         59 degrees C / 138 degrees F
      SFB 0 SFB-XF1-Zone0          OK         65 degrees C / 149 degrees F
      SFB 0 SFB-XF0-Zone0          OK         65 degrees C / 149 degrees F
      SFB 1 Intake-Zone0           OK         53 degrees C / 127 degrees F
      SFB 1 Exhaust-Zone1          OK         45 degrees C / 113 degrees F
      SFB 1 IntakeA-Zone0          OK         48 degrees C / 118 degrees F
      SFB 1 IntakeB-Zone1          OK         39 degrees C / 102 degrees F
      SFB 1 Exhaust-Zone0          OK         48 degrees C / 118 degrees F
      SFB 1 SFB-XF2-Zone1          OK         60 degrees C / 140 degrees F
      SFB 1 SFB-XF1-Zone0          OK         64 degrees C / 147 degrees F
      SFB 1 SFB-XF0-Zone0          OK         66 degrees C / 150 degrees F
      SFB 2 Intake-Zone0           OK         54 degrees C / 129 degrees F
      SFB 2 Exhaust-Zone1          OK         46 degrees C / 114 degrees F
      SFB 2 IntakeA-Zone0          OK         48 degrees C / 118 degrees F
      SFB 2 IntakeB-Zone1          OK         39 degrees C / 102 degrees F
      SFB 2 Exhaust-Zone0          OK         50 degrees C / 122 degrees F
      SFB 2 SFB-XF2-Zone1          OK         63 degrees C / 145 degrees F
      SFB 2 SFB-XF1-Zone0          OK         67 degrees C / 152 degrees F
      SFB 2 SFB-XF0-Zone0          OK         67 degrees C / 152 degrees F
      SFB 3 Intake-Zone0           OK         54 degrees C / 129 degrees F
      SFB 3 Exhaust-Zone1          OK         46 degrees C / 114 degrees F
      SFB 3 IntakeA-Zone0          OK         50 degrees C / 122 degrees F
      SFB 3 IntakeB-Zone1          OK         40 degrees C / 104 degrees F
      SFB 3 Exhaust-Zone0          OK         50 degrees C / 122 degrees F
      SFB 3 SFB-XF2-Zone1          OK         64 degrees C / 147 degrees F
      SFB 3 SFB-XF1-Zone0          OK         66 degrees C / 150 degrees F
      SFB 3 SFB-XF0-Zone0          OK         68 degrees C / 154 degrees F
      SFB 4 Intake-Zone0           OK         55 degrees C / 131 degrees F
      SFB 4 Exhaust-Zone1          OK         48 degrees C / 118 degrees F
      SFB 4 IntakeA-Zone0          OK         51 degrees C / 123 degrees F
      SFB 4 IntakeB-Zone1          OK         42 degrees C / 107 degrees F
      SFB 4 Exhaust-Zone0          OK         51 degrees C / 123 degrees F
      SFB 4 SFB-XF2-Zone1          OK         63 degrees C / 145 degrees F
      SFB 4 SFB-XF1-Zone0          OK         66 degrees C / 150 degrees F
      SFB 4 SFB-XF0-Zone0          OK         68 degrees C / 154 degrees F
      SFB 5 Intake-Zone0           OK         55 degrees C / 131 degrees F
      SFB 5 Exhaust-Zone1          OK         49 degrees C / 120 degrees F
      SFB 5 IntakeA-Zone0          OK         51 degrees C / 123 degrees F
      SFB 5 IntakeB-Zone1          OK         43 degrees C / 109 degrees F
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SFB 5 Exhaust-Zone0            OK          51 degrees C / 123 degrees F
SFB 5 SFB-XF2-Zone1            OK          65 degrees C / 149 degrees F
SFB 5 SFB-XF1-Zone0            OK          66 degrees C / 150 degrees F
SFB 5 SFB-XF0-Zone0            OK          71 degrees C / 159 degrees F
SFB 6 Intake-Zone0             OK          55 degrees C / 131 degrees F
SFB 6 Exhaust-Zone1            OK          49 degrees C / 120 degrees F
SFB 6 IntakeA-Zone0            OK          51 degrees C / 123 degrees F
SFB 6 IntakeB-Zone1            OK          43 degrees C / 109 degrees F
SFB 6 Exhaust-Zone0            OK          51 degrees C / 123 degrees F
SFB 6 SFB-XF2-Zone1            OK          64 degrees C / 147 degrees F
SFB 6 SFB-XF1-Zone0            OK          66 degrees C / 150 degrees F
SFB 6 SFB-XF0-Zone0            OK          68 degrees C / 154 degrees F
SFB 7 Intake-Zone0             OK          55 degrees C / 131 degrees F
SFB 7 Exhaust-Zone1            OK          49 degrees C / 120 degrees F
SFB 7 IntakeA-Zone0            OK          51 degrees C / 123 degrees F
SFB 7 IntakeB-Zone1            OK          43 degrees C / 109 degrees F
SFB 7 Exhaust-Zone0            OK          52 degrees C / 125 degrees F
SFB 7 SFB-XF2-Zone1            OK          66 degrees C / 150 degrees F
SFB 7 SFB-XF1-Zone0            OK          67 degrees C / 152 degrees F
SFB 7 SFB-XF0-Zone0            OK          70 degrees C / 158 degrees F
FPC 0 Intake                   OK          41 degrees C / 105 degrees F
FPC 0 Exhaust A                OK          48 degrees C / 118 degrees F
FPC 0 Exhaust B                OK          60 degrees C / 140 degrees F
FPC 0 LU 0 TSen                OK          56 degrees C / 132 degrees F
FPC 0 LU 0 Chip                OK          59 degrees C / 138 degrees F
FPC 0 LU 1 TSen                OK          56 degrees C / 132 degrees F
FPC 0 LU 1 Chip                OK          61 degrees C / 141 degrees F
FPC 0 LU 2 TSen                OK          56 degrees C / 132 degrees F
FPC 0 LU 2 Chip                OK          52 degrees C / 125 degrees F
FPC 0 LU 3 TSen                OK          56 degrees C / 132 degrees F
FPC 0 LU 3 Chip                OK          52 degrees C / 125 degrees F
FPC 0 MQ 0 TSen                OK          49 degrees C / 120 degrees F
FPC 0 MQ 0 Chip                OK          49 degrees C / 120 degrees F
FPC 0 MQ 1 TSen                OK          49 degrees C / 120 degrees F
FPC 0 MQ 1 Chip                OK          52 degrees C / 125 degrees F
FPC 0 MQ 2 TSen                OK          49 degrees C / 120 degrees F
FPC 0 MQ 2 Chip                OK          45 degrees C / 113 degrees F
FPC 0 MQ 3 TSen                OK          49 degrees C / 120 degrees F
FPC 0 MQ 3 Chip                OK          46 degrees C / 114 degrees F
FPC 1 Intake                   OK          39 degrees C / 102 degrees F
FPC 1 Exhaust A                OK          48 degrees C / 118 degrees F
FPC 1 Exhaust B                OK          55 degrees C / 131 degrees F
FPC 1 LU 0 TSen                OK          52 degrees C / 125 degrees F
FPC 1 LU 0 Chip                OK          54 degrees C / 129 degrees F
FPC 1 LU 1 TSen                OK          52 degrees C / 125 degrees F
FPC 1 LU 1 Chip                OK          56 degrees C / 132 degrees F
FPC 1 LU 2 TSen                OK          52 degrees C / 125 degrees F
FPC 1 LU 2 Chip                OK          49 degrees C / 120 degrees F
FPC 1 LU 3 TSen                OK          52 degrees C / 125 degrees F
FPC 1 LU 3 Chip                OK          50 degrees C / 122 degrees F
FPC 1 MQ 0 TSen                OK          48 degrees C / 118 degrees F
FPC 1 MQ 0 Chip                OK          48 degrees C / 118 degrees F
FPC 1 MQ 1 TSen                OK          48 degrees C / 118 degrees F
FPC 1 MQ 1 Chip                OK          51 degrees C / 123 degrees F
FPC 1 MQ 2 TSen                OK          48 degrees C / 118 degrees F
FPC 1 MQ 2 Chip                OK          45 degrees C / 113 degrees F
FPC 1 MQ 3 TSen                OK          48 degrees C / 118 degrees F
FPC 1 MQ 3 Chip                OK          45 degrees C / 113 degrees F
FPC 2 Intake                   OK          39 degrees C / 102 degrees F
FPC 2 Exhaust A                OK          48 degrees C / 118 degrees F
FPC 2 Exhaust B                OK          58 degrees C / 136 degrees F
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FPC 2 LU 0 TSen              OK         55 degrees C / 131 degrees F
FPC 2 LU 0 Chip              OK         57 degrees C / 134 degrees F
FPC 2 LU 1 TSen              OK         55 degrees C / 131 degrees F
FPC 2 LU 1 Chip              OK         63 degrees C / 145 degrees F
FPC 2 LU 2 TSen              OK         55 degrees C / 131 degrees F
FPC 2 LU 2 Chip              OK         51 degrees C / 123 degrees F
FPC 2 LU 3 TSen              OK         55 degrees C / 131 degrees F
FPC 2 LU 3 Chip              OK         52 degrees C / 125 degrees F
FPC 2 MQ 0 TSen              OK         48 degrees C / 118 degrees F
FPC 2 MQ 0 Chip              OK         50 degrees C / 122 degrees F
FPC 2 MQ 1 TSen              OK         48 degrees C / 118 degrees F
FPC 2 MQ 1 Chip              OK         52 degrees C / 125 degrees F
FPC 2 MQ 2 TSen              OK         48 degrees C / 118 degrees F
FPC 2 MQ 2 Chip              OK         47 degrees C / 116 degrees F
FPC 2 MQ 3 TSen              OK         48 degrees C / 118 degrees F
FPC 2 MQ 3 Chip              OK         47 degrees C / 116 degrees F
FPC 3 Intake                 OK         41 degrees C / 105 degrees F
FPC 3 Exhaust A              OK         48 degrees C / 118 degrees F
FPC 3 Exhaust B              OK         58 degrees C / 136 degrees F
FPC 3 LU 0 TSen              OK         56 degrees C / 132 degrees F
FPC 3 LU 0 Chip              OK         59 degrees C / 138 degrees F
FPC 3 LU 1 TSen              OK         56 degrees C / 132 degrees F
FPC 3 LU 1 Chip              OK         61 degrees C / 141 degrees F
FPC 3 LU 2 TSen              OK         56 degrees C / 132 degrees F
FPC 3 LU 2 Chip              OK         51 degrees C / 123 degrees F
FPC 3 LU 3 TSen              OK         56 degrees C / 132 degrees F
FPC 3 LU 3 Chip              OK         53 degrees C / 127 degrees F
FPC 3 MQ 0 TSen              OK         50 degrees C / 122 degrees F
FPC 3 MQ 0 Chip              OK         51 degrees C / 123 degrees F
FPC 3 MQ 1 TSen              OK         50 degrees C / 122 degrees F
FPC 3 MQ 1 Chip              OK         55 degrees C / 131 degrees F
FPC 3 MQ 2 TSen              OK         50 degrees C / 122 degrees F
FPC 3 MQ 2 Chip              OK         47 degrees C / 116 degrees F
FPC 3 MQ 3 TSen              OK         50 degrees C / 122 degrees F
FPC 3 MQ 3 Chip              OK         50 degrees C / 122 degrees F
FPC 4 Intake                 OK         41 degrees C / 105 degrees F
FPC 4 Exhaust A              OK         48 degrees C / 118 degrees F
FPC 4 Exhaust B              OK         59 degrees C / 138 degrees F
FPC 4 LU 0 TSen              OK         56 degrees C / 132 degrees F
FPC 4 LU 0 Chip              OK         60 degrees C / 140 degrees F
FPC 4 LU 1 TSen              OK         56 degrees C / 132 degrees F
FPC 4 LU 1 Chip              OK         64 degrees C / 147 degrees F
FPC 4 LU 2 TSen              OK         56 degrees C / 132 degrees F
FPC 4 LU 2 Chip              OK         51 degrees C / 123 degrees F
FPC 4 LU 3 TSen              OK         56 degrees C / 132 degrees F
FPC 4 LU 3 Chip              OK         54 degrees C / 129 degrees F
FPC 4 MQ 0 TSen              OK         49 degrees C / 120 degrees F
FPC 4 MQ 0 Chip              OK         53 degrees C / 127 degrees F
FPC 4 MQ 1 TSen              OK         49 degrees C / 120 degrees F
FPC 4 MQ 1 Chip              OK         55 degrees C / 131 degrees F
FPC 4 MQ 2 TSen              OK         49 degrees C / 120 degrees F
FPC 4 MQ 2 Chip              OK         48 degrees C / 118 degrees F
FPC 4 MQ 3 TSen              OK         49 degrees C / 120 degrees F
FPC 4 MQ 3 Chip              OK         49 degrees C / 120 degrees F
FPC 5 Intake                 OK         42 degrees C / 107 degrees F
FPC 5 Exhaust A              OK         49 degrees C / 120 degrees F
FPC 5 Exhaust B              OK         61 degrees C / 141 degrees F
FPC 5 LU 0 TSen              OK         58 degrees C / 136 degrees F
FPC 5 LU 0 Chip              OK         61 degrees C / 141 degrees F
FPC 5 LU 1 TSen              OK         58 degrees C / 136 degrees F
FPC 5 LU 1 Chip              OK         64 degrees C / 147 degrees F
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FPC 5 LU 2 TSen              OK         58 degrees C / 136 degrees F
FPC 5 LU 2 Chip              OK         56 degrees C / 132 degrees F
FPC 5 LU 3 TSen              OK         58 degrees C / 136 degrees F
FPC 5 LU 3 Chip              OK         54 degrees C / 129 degrees F
FPC 5 MQ 0 TSen              OK         51 degrees C / 123 degrees F
FPC 5 MQ 0 Chip              OK         53 degrees C / 127 degrees F
FPC 5 MQ 1 TSen              OK         51 degrees C / 123 degrees F
FPC 5 MQ 1 Chip              OK         55 degrees C / 131 degrees F
FPC 5 MQ 2 TSen              OK         51 degrees C / 123 degrees F
FPC 5 MQ 2 Chip              OK         50 degrees C / 122 degrees F
FPC 5 MQ 3 TSen              OK         51 degrees C / 123 degrees F
FPC 5 MQ 3 Chip              OK         49 degrees C / 120 degrees F
FPC 6 Intake                 OK         42 degrees C / 107 degrees F
FPC 6 Exhaust A              OK         50 degrees C / 122 degrees F
FPC 6 Exhaust B              OK         61 degrees C / 141 degrees F
FPC 6 LU 0 TSen              OK         58 degrees C / 136 degrees F
FPC 6 LU 0 Chip              OK         62 degrees C / 143 degrees F
FPC 6 LU 1 TSen              OK         58 degrees C / 136 degrees F
FPC 6 LU 1 Chip              OK         64 degrees C / 147 degrees F
FPC 6 LU 2 TSen              OK         58 degrees C / 136 degrees F
FPC 6 LU 2 Chip              OK         56 degrees C / 132 degrees F
FPC 6 LU 3 TSen              OK         58 degrees C / 136 degrees F
FPC 6 LU 3 Chip              OK         56 degrees C / 132 degrees F
FPC 6 MQ 0 TSen              OK         51 degrees C / 123 degrees F
FPC 6 MQ 0 Chip              OK         58 degrees C / 136 degrees F
FPC 6 MQ 1 TSen              OK         51 degrees C / 123 degrees F
FPC 6 MQ 1 Chip              OK         61 degrees C / 141 degrees F
FPC 6 MQ 2 TSen              OK         51 degrees C / 123 degrees F
FPC 6 MQ 2 Chip              OK         51 degrees C / 123 degrees F
FPC 6 MQ 3 TSen              OK         51 degrees C / 123 degrees F
FPC 6 MQ 3 Chip              OK         51 degrees C / 123 degrees F
FPC 7 Intake                 OK         42 degrees C / 107 degrees F
FPC 7 Exhaust A              OK         50 degrees C / 122 degrees F
FPC 7 Exhaust B              OK         61 degrees C / 141 degrees F
FPC 7 LU 0 TSen              OK         58 degrees C / 136 degrees F
FPC 7 LU 0 Chip              OK         59 degrees C / 138 degrees F
FPC 7 LU 1 TSen              OK         58 degrees C / 136 degrees F
FPC 7 LU 1 Chip              OK         64 degrees C / 147 degrees F
FPC 7 LU 2 TSen              OK         58 degrees C / 136 degrees F
FPC 7 LU 2 Chip              OK         54 degrees C / 129 degrees F
FPC 7 LU 3 TSen              OK         58 degrees C / 136 degrees F
FPC 7 LU 3 Chip              OK         53 degrees C / 127 degrees F
FPC 7 MQ 0 TSen              OK         51 degrees C / 123 degrees F
FPC 7 MQ 0 Chip              OK         53 degrees C / 127 degrees F
FPC 7 MQ 1 TSen              OK         51 degrees C / 123 degrees F
FPC 7 MQ 1 Chip              OK         54 degrees C / 129 degrees F
FPC 7 MQ 2 TSen              OK         51 degrees C / 123 degrees F
FPC 7 MQ 2 Chip              OK         48 degrees C / 118 degrees F
FPC 7 MQ 3 TSen              OK         51 degrees C / 123 degrees F
FPC 7 MQ 3 Chip              OK         48 degrees C / 118 degrees F
FPC 8 Intake                 OK         42 degrees C / 107 degrees F
FPC 8 Exhaust A              OK         50 degrees C / 122 degrees F
FPC 8 Exhaust B              OK         61 degrees C / 141 degrees F
FPC 8 LU 0 TSen              OK         58 degrees C / 136 degrees F
FPC 8 LU 0 Chip              OK         63 degrees C / 145 degrees F
FPC 8 LU 1 TSen              OK         58 degrees C / 136 degrees F
FPC 8 LU 1 Chip              OK         65 degrees C / 149 degrees F
FPC 8 LU 2 TSen              OK         58 degrees C / 136 degrees F
FPC 8 LU 2 Chip              OK         56 degrees C / 132 degrees F
FPC 8 LU 3 TSen              OK         58 degrees C / 136 degrees F
FPC 8 LU 3 Chip              OK         56 degrees C / 132 degrees F
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FPC 8 MQ 0 TSen              OK          50 degrees C / 122 degrees F
FPC 8 MQ 0 Chip              OK          53 degrees C / 127 degrees F
FPC 8 MQ 1 TSen              OK          50 degrees C / 122 degrees F
FPC 8 MQ 1 Chip              OK          58 degrees C / 136 degrees F
FPC 8 MQ 2 TSen              OK          50 degrees C / 122 degrees F
FPC 8 MQ 2 Chip              OK          48 degrees C / 118 degrees F
FPC 8 MQ 3 TSen              OK          50 degrees C / 122 degrees F
FPC 8 MQ 3 Chip              OK          49 degrees C / 120 degrees F
FPC 9 Intake                 OK          43 degrees C / 109 degrees F
FPC 9 Exhaust A              OK          51 degrees C / 123 degrees F
FPC 9 Exhaust B              OK          61 degrees C / 141 degrees F
FPC 9 LU 0 TSen              OK          58 degrees C / 136 degrees F
FPC 9 LU 0 Chip              OK          61 degrees C / 141 degrees F
FPC 9 LU 1 TSen              OK          58 degrees C / 136 degrees F
FPC 9 LU 1 Chip              OK          63 degrees C / 145 degrees F
FPC 9 LU 2 TSen              OK          58 degrees C / 136 degrees F
FPC 9 LU 2 Chip              OK          55 degrees C / 131 degrees F
FPC 9 LU 3 TSen              OK          58 degrees C / 136 degrees F
FPC 9 LU 3 Chip              OK          54 degrees C / 129 degrees F
FPC 9 MQ 0 TSen              OK          52 degrees C / 125 degrees F
FPC 9 MQ 0 Chip              OK          53 degrees C / 127 degrees F
FPC 9 MQ 1 TSen              OK          52 degrees C / 125 degrees F
FPC 9 MQ 1 Chip              OK          54 degrees C / 129 degrees F
FPC 9 MQ 2 TSen              OK          52 degrees C / 125 degrees F
FPC 9 MQ 2 Chip              OK          48 degrees C / 118 degrees F
FPC 9 MQ 3 TSen              OK          52 degrees C / 125 degrees F
FPC 9 MQ 3 Chip              OK          49 degrees C / 120 degrees F
FPC 10 Intake                OK          44 degrees C / 111 degrees F
FPC 10 Exhaust A             OK          48 degrees C / 118 degrees F
FPC 10 Exhaust B             OK          54 degrees C / 129 degrees F
FPC 10 LU 0 TSen             OK          53 degrees C / 127 degrees F
FPC 10 LU 0 Chip             OK          54 degrees C / 129 degrees F
FPC 10 LU 1 TSen             OK          53 degrees C / 127 degrees F
FPC 10 LU 1 Chip             OK          58 degrees C / 136 degrees F
FPC 10 LU 2 TSen             OK          53 degrees C / 127 degrees F
FPC 10 LU 2 Chip             OK          51 degrees C / 123 degrees F
FPC 10 LU 3 TSen             OK          53 degrees C / 127 degrees F
FPC 10 LU 3 Chip             OK          51 degrees C / 123 degrees F
FPC 10 MQ 0 TSen             OK          49 degrees C / 120 degrees F
FPC 10 MQ 0 Chip             OK          50 degrees C / 122 degrees F
FPC 10 MQ 1 TSen             OK          49 degrees C / 120 degrees F
FPC 10 MQ 1 Chip             OK          52 degrees C / 125 degrees F
FPC 10 MQ 2 TSen             OK          49 degrees C / 120 degrees F
FPC 10 MQ 2 Chip             OK          48 degrees C / 118 degrees F
FPC 10 MQ 3 TSen             OK          49 degrees C / 120 degrees F
FPC 10 MQ 3 Chip             OK          48 degrees C / 118 degrees F
FPC 11 Intake                OK          39 degrees C / 102 degrees F
FPC 11 Exhaust A             OK          47 degrees C / 116 degrees F
FPC 11 Exhaust B             OK          51 degrees C / 123 degrees F
FPC 11 LU 0 TSen             OK          50 degrees C / 122 degrees F
FPC 11 LU 0 Chip             OK          52 degrees C / 125 degrees F
FPC 11 LU 1 TSen             OK          50 degrees C / 122 degrees F
FPC 11 LU 1 Chip             OK          55 degrees C / 131 degrees F
FPC 11 LU 2 TSen             OK          50 degrees C / 122 degrees F
FPC 11 LU 2 Chip             OK          49 degrees C / 120 degrees F
FPC 11 LU 3 TSen             OK          50 degrees C / 122 degrees F
FPC 11 LU 3 Chip             OK          49 degrees C / 120 degrees F
FPC 11 MQ 0 TSen             OK          47 degrees C / 116 degrees F
FPC 11 MQ 0 Chip             OK          47 degrees C / 116 degrees F
FPC 11 MQ 1 TSen             OK          47 degrees C / 116 degrees F
FPC 11 MQ 1 Chip             OK          51 degrees C / 123 degrees F
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FPC 11 MQ 2 TSen              OK         47 degrees C / 116 degrees F
FPC 11 MQ 2 Chip              OK         45 degrees C / 113 degrees F
FPC 11 MQ 3 TSen              OK         47 degrees C / 116 degrees F
FPC 11 MQ 3 Chip              OK         49 degrees C / 120 degrees F
FPC 12 Intake                 OK         39 degrees C / 102 degrees F
FPC 12 Exhaust A              OK         47 degrees C / 116 degrees F
FPC 12 Exhaust B              OK         50 degrees C / 122 degrees F
FPC 12 LU 0 TSen              OK         49 degrees C / 120 degrees F
FPC 12 LU 0 Chip              OK         51 degrees C / 123 degrees F
FPC 12 LU 1 TSen              OK         49 degrees C / 120 degrees F
FPC 12 LU 1 Chip              OK         54 degrees C / 129 degrees F
FPC 12 LU 2 TSen              OK         49 degrees C / 120 degrees F
FPC 12 LU 2 Chip              OK         47 degrees C / 116 degrees F
FPC 12 LU 3 TSen              OK         49 degrees C / 120 degrees F
FPC 12 LU 3 Chip              OK         49 degrees C / 120 degrees F
FPC 12 MQ 0 TSen              OK         47 degrees C / 116 degrees F
FPC 12 MQ 0 Chip              OK         46 degrees C / 114 degrees F
FPC 12 MQ 1 TSen              OK         47 degrees C / 116 degrees F
FPC 12 MQ 1 Chip              OK         51 degrees C / 123 degrees F
FPC 12 MQ 2 TSen              OK         47 degrees C / 116 degrees F
FPC 12 MQ 2 Chip              OK         45 degrees C / 113 degrees F
FPC 12 MQ 3 TSen              OK         47 degrees C / 116 degrees F
FPC 12 MQ 3 Chip              OK         47 degrees C / 116 degrees F
FPC 13 Intake                 OK         40 degrees C / 104 degrees F
FPC 13 Exhaust A              OK         48 degrees C / 118 degrees F
FPC 13 Exhaust B              OK         51 degrees C / 123 degrees F
FPC 13 LU 0 TSen              OK         50 degrees C / 122 degrees F
FPC 13 LU 0 Chip              OK         52 degrees C / 125 degrees F
FPC 13 LU 1 TSen              OK         50 degrees C / 122 degrees F
FPC 13 LU 1 Chip              OK         54 degrees C / 129 degrees F
FPC 13 LU 2 TSen              OK         50 degrees C / 122 degrees F
FPC 13 LU 2 Chip              OK         48 degrees C / 118 degrees F
FPC 13 LU 3 TSen              OK         50 degrees C / 122 degrees F
FPC 13 LU 3 Chip              OK         48 degrees C / 118 degrees F
FPC 13 MQ 0 TSen              OK         48 degrees C / 118 degrees F
FPC 13 MQ 0 Chip              OK         47 degrees C / 116 degrees F
FPC 13 MQ 1 TSen              OK         48 degrees C / 118 degrees F
FPC 13 MQ 1 Chip              OK         51 degrees C / 123 degrees F
FPC 13 MQ 2 TSen              OK         48 degrees C / 118 degrees F
FPC 13 MQ 2 Chip              OK         46 degrees C / 114 degrees F
FPC 13 MQ 3 TSen              OK         48 degrees C / 118 degrees F
FPC 13 MQ 3 Chip              OK         47 degrees C / 116 degrees F
FPC 14 Intake                 OK         41 degrees C / 105 degrees F
FPC 14 Exhaust A              OK         49 degrees C / 120 degrees F
FPC 14 Exhaust B              OK         50 degrees C / 122 degrees F
FPC 14 LU 0 TSen              OK         49 degrees C / 120 degrees F
FPC 14 LU 0 Chip              OK         50 degrees C / 122 degrees F
FPC 14 LU 1 TSen              OK         49 degrees C / 120 degrees F
FPC 14 LU 1 Chip              OK         54 degrees C / 129 degrees F
FPC 14 LU 2 TSen              OK         49 degrees C / 120 degrees F
FPC 14 LU 2 Chip              OK         48 degrees C / 118 degrees F
FPC 14 LU 3 TSen              OK         49 degrees C / 120 degrees F
FPC 14 LU 3 Chip              OK         50 degrees C / 122 degrees F
FPC 14 MQ 0 TSen              OK         48 degrees C / 118 degrees F
FPC 14 MQ 0 Chip              OK         48 degrees C / 118 degrees F
FPC 14 MQ 1 TSen              OK         48 degrees C / 118 degrees F
FPC 14 MQ 1 Chip              OK         52 degrees C / 125 degrees F
FPC 14 MQ 2 TSen              OK         48 degrees C / 118 degrees F
FPC 14 MQ 2 Chip              OK         47 degrees C / 116 degrees F
FPC 14 MQ 3 TSen              OK         48 degrees C / 118 degrees F
FPC 14 MQ 3 Chip              OK         50 degrees C / 122 degrees F
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FPC 15 Intake               OK         42 degrees C / 107 degrees F
FPC 15 Exhaust A            OK         51 degrees C / 123 degrees F
FPC 15 Exhaust B            OK         52 degrees C / 125 degrees F
FPC 15 LU 0 TSen            OK         52 degrees C / 125 degrees F
FPC 15 LU 0 Chip            OK         55 degrees C / 131 degrees F
FPC 15 LU 1 TSen            OK         52 degrees C / 125 degrees F
FPC 15 LU 1 Chip            OK         59 degrees C / 138 degrees F
FPC 15 LU 2 TSen            OK         52 degrees C / 125 degrees F
FPC 15 LU 2 Chip            OK         50 degrees C / 122 degrees F
FPC 15 LU 3 TSen            OK         52 degrees C / 125 degrees F
FPC 15 LU 3 Chip            OK         51 degrees C / 123 degrees F
FPC 15 MQ 0 TSen            OK         51 degrees C / 123 degrees F
FPC 15 MQ 0 Chip            OK         53 degrees C / 127 degrees F
FPC 15 MQ 1 TSen            OK         51 degrees C / 123 degrees F
FPC 15 MQ 1 Chip            OK         60 degrees C / 140 degrees F
FPC 15 MQ 2 TSen            OK         51 degrees C / 123 degrees F
FPC 15 MQ 2 Chip            OK         52 degrees C / 125 degrees F
FPC 15 MQ 3 TSen            OK         51 degrees C / 123 degrees F
FPC 15 MQ 3 Chip            OK         53 degrees C / 127 degrees F
FPC 16 Intake               OK         44 degrees C / 111 degrees F
FPC 16 Exhaust A            OK         51 degrees C / 123 degrees F
FPC 16 Exhaust B            OK         53 degrees C / 127 degrees F
FPC 16 LU 0 TSen            OK         51 degrees C / 123 degrees F
FPC 16 LU 0 Chip            OK         52 degrees C / 125 degrees F
FPC 16 LU 1 TSen            OK         51 degrees C / 123 degrees F
FPC 16 LU 1 Chip            OK         56 degrees C / 132 degrees F
FPC 16 LU 2 TSen            OK         51 degrees C / 123 degrees F
FPC 16 LU 2 Chip            OK         50 degrees C / 122 degrees F
FPC 16 LU 3 TSen            OK         51 degrees C / 123 degrees F
FPC 16 LU 3 Chip            OK         50 degrees C / 122 degrees F
FPC 16 MQ 0 TSen            OK         51 degrees C / 123 degrees F
FPC 16 MQ 0 Chip            OK         50 degrees C / 122 degrees F
FPC 16 MQ 1 TSen            OK         51 degrees C / 123 degrees F
FPC 16 MQ 1 Chip            OK         55 degrees C / 131 degrees F
FPC 16 MQ 2 TSen            OK         51 degrees C / 123 degrees F
FPC 16 MQ 2 Chip            OK         49 degrees C / 120 degrees F
FPC 16 MQ 3 TSen            OK         51 degrees C / 123 degrees F
FPC 16 MQ 3 Chip            OK         52 degrees C / 125 degrees F
FPC 17 Intake               OK         45 degrees C / 113 degrees F
FPC 17 Exhaust A            OK         52 degrees C / 125 degrees F
FPC 17 Exhaust B            OK         55 degrees C / 131 degrees F
FPC 17 LU 0 TSen            OK         54 degrees C / 129 degrees F
FPC 17 LU 0 Chip            OK         57 degrees C / 134 degrees F
FPC 17 LU 1 TSen            OK         54 degrees C / 129 degrees F
FPC 17 LU 1 Chip            OK         61 degrees C / 141 degrees F
FPC 17 LU 2 TSen            OK         54 degrees C / 129 degrees F
FPC 17 LU 2 Chip            OK         54 degrees C / 129 degrees F
FPC 17 LU 3 TSen            OK         54 degrees C / 129 degrees F
FPC 17 LU 3 Chip            OK         55 degrees C / 131 degrees F
FPC 17 MQ 0 TSen            OK         53 degrees C / 127 degrees F
FPC 17 MQ 0 Chip            OK         53 degrees C / 127 degrees F
FPC 17 MQ 1 TSen            OK         53 degrees C / 127 degrees F
FPC 17 MQ 1 Chip            OK         57 degrees C / 134 degrees F
FPC 17 MQ 2 TSen            OK         53 degrees C / 127 degrees F
FPC 17 MQ 2 Chip            OK         51 degrees C / 123 degrees F
FPC 17 MQ 3 TSen            OK         53 degrees C / 127 degrees F
FPC 17 MQ 3 Chip            OK         54 degrees C / 129 degrees F
FPC 18 Intake               OK         46 degrees C / 114 degrees F
FPC 18 Exhaust A            OK         53 degrees C / 127 degrees F
FPC 18 Exhaust B            OK         57 degrees C / 134 degrees F
FPC 18 LU 0 TSen            OK         56 degrees C / 132 degrees F
```

```
FPC 18 LU 0 Chip          OK       58 degrees C / 136 degrees F
FPC 18 LU 1 TSen          OK       56 degrees C / 132 degrees F
FPC 18 LU 1 Chip          OK       63 degrees C / 145 degrees F
FPC 18 LU 2 TSen          OK       56 degrees C / 132 degrees F
FPC 18 LU 2 Chip          OK       54 degrees C / 129 degrees F
FPC 18 LU 3 TSen          OK       56 degrees C / 132 degrees F
FPC 18 LU 3 Chip          OK       56 degrees C / 132 degrees F
FPC 18 MQ 0 TSen          OK       54 degrees C / 129 degrees F
FPC 18 MQ 0 Chip          OK       57 degrees C / 134 degrees F
FPC 18 MQ 1 TSen          OK       54 degrees C / 129 degrees F
FPC 18 MQ 1 Chip          OK       62 degrees C / 143 degrees F
FPC 18 MQ 2 TSen          OK       54 degrees C / 129 degrees F
FPC 18 MQ 2 Chip          OK       53 degrees C / 127 degrees F
FPC 18 MQ 3 TSen          OK       54 degrees C / 129 degrees F
FPC 18 MQ 3 Chip          OK       56 degrees C / 132 degrees F
FPC 19 Intake             OK       49 degrees C / 120 degrees F
FPC 19 Exhaust A          OK       56 degrees C / 132 degrees F
FPC 19 Exhaust B          OK       62 degrees C / 143 degrees F
FPC 19 LU 0 TSen          OK       62 degrees C / 143 degrees F
FPC 19 LU 0 Chip          OK       63 degrees C / 145 degrees F
FPC 19 LU 1 TSen          OK       62 degrees C / 143 degrees F
FPC 19 LU 1 Chip          OK       69 degrees C / 156 degrees F
FPC 19 LU 2 TSen          OK       62 degrees C / 143 degrees F
FPC 19 LU 2 Chip          OK       61 degrees C / 141 degrees F
FPC 19 LU 3 TSen          OK       62 degrees C / 143 degrees F
FPC 19 LU 3 Chip          OK       62 degrees C / 143 degrees F
FPC 19 MQ 0 TSen          OK       58 degrees C / 136 degrees F
FPC 19 MQ 0 Chip          OK       62 degrees C / 143 degrees F
FPC 19 MQ 1 TSen          OK       58 degrees C / 136 degrees F
FPC 19 MQ 1 Chip          OK       64 degrees C / 147 degrees F
FPC 19 MQ 2 TSen          OK       58 degrees C / 136 degrees F
FPC 19 MQ 2 Chip          OK       59 degrees C / 138 degrees F
FPC 19 MQ 3 TSen          OK       58 degrees C / 136 degrees F
FPC 19 MQ 3 Chip          OK       60 degrees C / 140 degrees F
ADC 0 Intake              OK       40 degrees C / 104 degrees F
ADC 0 Exhaust             OK       50 degrees C / 122 degrees F
ADC 0 ADC-XF1             OK       58 degrees C / 136 degrees F
ADC 0 ADC-XF0             OK       63 degrees C / 145 degrees F
ADC 1 Intake              OK       38 degrees C / 100 degrees F
ADC 1 Exhaust             OK       48 degrees C / 118 degrees F
ADC 1 ADC-XF1             OK       59 degrees C / 138 degrees F
ADC 1 ADC-XF0             OK       61 degrees C / 141 degrees F
ADC 2 Intake              OK       36 degrees C / 96 degrees F
ADC 2 Exhaust             OK       50 degrees C / 122 degrees F
ADC 2 ADC-XF1             OK       53 degrees C / 127 degrees F
ADC 2 ADC-XF0             OK       59 degrees C / 138 degrees F
ADC 3 Intake              OK       39 degrees C / 102 degrees F
ADC 3 Exhaust             OK       49 degrees C / 120 degrees F
ADC 3 ADC-XF1             OK       61 degrees C / 141 degrees F
ADC 3 ADC-XF0             OK       62 degrees C / 143 degrees F
ADC 4 Intake              OK       39 degrees C / 102 degrees F
ADC 4 Exhaust             OK       49 degrees C / 120 degrees F
ADC 4 ADC-XF1             OK       60 degrees C / 140 degrees F
ADC 4 ADC-XF0             OK       61 degrees C / 141 degrees F
ADC 5 Intake              OK       38 degrees C / 100 degrees F
ADC 5 Exhaust             OK       52 degrees C / 125 degrees F
ADC 5 ADC-XF1             OK       55 degrees C / 131 degrees F
ADC 5 ADC-XF0             OK       65 degrees C / 149 degrees F
ADC 6 Intake              OK       39 degrees C / 102 degrees F
ADC 6 Exhaust             OK       51 degrees C / 123 degrees F
ADC 6 ADC-XF1             OK       58 degrees C / 136 degrees F
```



```
ADC 6 ADC-XF0                 OK         63 degrees C / 145 degrees F
ADC 7 Intake                  OK         39 degrees C / 102 degrees F
ADC 7 Exhaust                 OK         52 degrees C / 125 degrees F
ADC 7 ADC-XF1                 OK         61 degrees C / 141 degrees F
ADC 7 ADC-XF0                 OK         68 degrees C / 154 degrees F
ADC 8 Intake                  OK         39 degrees C / 102 degrees F
ADC 8 Exhaust                 OK         50 degrees C / 122 degrees F
ADC 8 ADC-XF1                 OK         64 degrees C / 147 degrees F
ADC 8 ADC-XF0                 OK         63 degrees C / 145 degrees F
ADC 9 Intake                  OK         41 degrees C / 105 degrees F
ADC 9 Exhaust                 OK         50 degrees C / 122 degrees F
ADC 9 ADC-XF1                 OK         60 degrees C / 140 degrees F
ADC 9 ADC-XF0                 OK         62 degrees C / 143 degrees F
ADC 10 Intake                 OK         46 degrees C / 114 degrees F
ADC 10 Exhaust                OK         53 degrees C / 127 degrees F
ADC 10 ADC-XF1                OK         66 degrees C / 150 degrees F
ADC 10 ADC-XF0                OK         65 degrees C / 149 degrees F
ADC 11 Intake                 OK         46 degrees C / 114 degrees F
ADC 11 Exhaust                OK         53 degrees C / 127 degrees F
ADC 11 ADC-XF1                OK         63 degrees C / 145 degrees F
ADC 11 ADC-XF0                OK         64 degrees C / 147 degrees F
ADC 12 Intake                 OK         47 degrees C / 116 degrees F
ADC 12 Exhaust                OK         53 degrees C / 127 degrees F
ADC 12 ADC-XF1                OK         65 degrees C / 149 degrees F
ADC 12 ADC-XF0                OK         65 degrees C / 149 degrees F
ADC 13 Intake                 OK         48 degrees C / 118 degrees F
ADC 13 Exhaust                OK         55 degrees C / 131 degrees F
ADC 13 ADC-XF1                OK         65 degrees C / 149 degrees F
ADC 13 ADC-XF0                OK         67 degrees C / 152 degrees F
ADC 14 Intake                 OK         49 degrees C / 120 degrees F
ADC 14 Exhaust                OK         57 degrees C / 134 degrees F
ADC 14 ADC-XF1                OK         68 degrees C / 154 degrees F
ADC 14 ADC-XF0                OK         72 degrees C / 161 degrees F
ADC 15 Intake                 OK         50 degrees C / 122 degrees F
ADC 15 Exhaust                OK         56 degrees C / 132 degrees F
ADC 15 ADC-XF1                OK         68 degrees C / 154 degrees F
ADC 15 ADC-XF0                OK         68 degrees C / 154 degrees F
ADC 16 Intake                 OK         51 degrees C / 123 degrees F
ADC 16 Exhaust                OK         57 degrees C / 134 degrees F
ADC 16 ADC-XF1                OK         67 degrees C / 152 degrees F
ADC 16 ADC-XF0                OK         68 degrees C / 154 degrees F
ADC 17 Intake                 OK         51 degrees C / 123 degrees F
ADC 17 Exhaust                OK         57 degrees C / 134 degrees F
ADC 17 ADC-XF1                OK         69 degrees C / 156 degrees F
ADC 17 ADC-XF0                OK         69 degrees C / 156 degrees F
ADC 18 Intake                 OK         52 degrees C / 125 degrees F
ADC 18 Exhaust                OK         58 degrees C / 136 degrees F
ADC 18 ADC-XF1                OK         67 degrees C / 152 degrees F
ADC 18 ADC-XF0                OK         72 degrees C / 161 degrees F
ADC 19 Intake                 OK         50 degrees C / 122 degrees F
ADC 19 Exhaust                OK         58 degrees C / 136 degrees F
ADC 19 ADC-XF1                OK         68 degrees C / 154 degrees F
ADC 19 ADC-XF0                OK         71 degrees C / 159 degrees F
```

show chassis environment mcs

Syntax

show chassis environment mcs
<*slot*>

Release Information

Command introduced before Junos OS Release 7.4.

Description

(M40e and M160 routers only) Display environmental information about the Miscellaneous Control Subsystems (MCSs).

Options

none—Display environmental information about both MCSs.

slot —(Optional) Display environmental information about an individual MCS. Replace ***slot*** with **0** or **1**

Required Privilege Level

view

Related Documentation

- request chassis mcs on page 639

List of Sample Output

show chassis environment mcs (M40e Router) on page 861
show chassis environment mcs (M160 Router) on page 861

Output Fields

Table 53 on page 860 lists the output fields for the **show chassis environment mcs** command. Output fields are listed in the approximate order in which they appear.

Table 53: show chassis environment mcs Output Fields

Field Name	Field Description
State	Status of the MCS: • **Present**—MCS is detected by the chassis daemon but is either not supported by the current version of Junos or MCS is coming up but not yet online. • **Online**—MCS is online and running. • **Offline**—MCS is powered down. • **Empty**—No MCS is present. • **Master**—MCS is online, operating as master. • **Standby**—MCS is online, operating as standby.
Temperature	Temperature of the air flowing past the MCS.
Power	Information about the voltage supplied to the MCS. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.
FPGA Revision	Revision level of the field-programmable gate array (FPGA) revision.

Sample Output

show chassis environment mcs (M40e Router)

```
user@host> show chassis environment mcs
MCS 0 status:
  State                          Online Master
  Temperature                 45 degrees C / 113 degrees F
  Power:
    3.3 V                   3283 mV
    5.0 V                   5013 mV
    12.0 V                 11721 mV
    5.0 V bias              5025 mV
    8.0 V bias              8229 mV
  BUS Revision                12
  FPGA Revision               13
MCS 1 status:
  State                          Online Standby
  Temperature                 42 degrees C / 107 degrees F
  Power:
    3.3 V                   3296 mV
    5.0 V                   4971 mV
    12.0 V                 11814 mV
    5.0 V bias              4976 mV
    8.0 V bias              8241 mV
  BUS Revision                12
  FPGA Revision               13
```

show chassis environment mcs (M160 Router)

```
user@host> show chassis environment mcs
MCS 0 status:
  State                          Online Master
  Temperature                 50 degrees C / 122 degrees F
  Power:
    3.3 V                   3306 mV
    5.0 V                   4993 mV
    12.0 V                 11799 mV
    5.0 V bias              4993 mV
    8.0 V bias              8288 mV
  BUS Revision                12
  FPGA Revision               13
```


show chassis environment monitored

Syntax show chassis environment monitored

Release Information Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description (PTX Series Packet Transport Routers, and MX2010 and MX2020 routers) Display status information for monitored temperatures.

On the PTX Series Packet Transport Routers, and on MX2010 and MX2020 routers, you can configure which temperatures are monitored for computing temperature alarms. Use this command to display only the temperatures that are monitored. Temperatures that are not included in the temperature alarm computations are not displayed.

Options This command has no options.

Required Privilege Level view

Related Documentation

- show chassis environment on page 719
- *Chassis-Level Feature Guide*

List of Sample Output
show chassis environment monitored (PTX5000 Packet Transport Router) on page 862
show chassis environment monitored (MX2010 Router) on page 863
show chassis environment monitored (MX2020 Router) on page 865

Output Fields Table 52 on page 847 lists the output fields for the **show chassis environment monitored** command. Output fields are listed in the approximate order in which they appear.

Table 54: show chassis environment monitored Output Fields

Field Name	Field Description
Item	Chassis component: • (PTX Series Packet Transport Routers, and MX2010 and MX2020 routers)—Information about the chassis, Routing Engines, Control Boards (CBs), Switch Interface Boards (SIBs), PICs, and Flexible PIC Concentrators (FPCs).
Status	Status of the specified item. Status can be **OK** or **Alarm**.
Measurement	Temperature of the air flowing past the specified chassis component. Temperature is displayed in degrees Celsius (C) and degrees Fahrenheit (F).

Sample Output

show chassis environment monitored (PTX5000 Packet Transport Router)

```
user@host> show chassis environment monitored
```

```
Class Item                           Status     Measurement
      Routing Engine 0 CPU           OK         71 degrees C / 159 degrees F
      Routing Engine 1 CPU           OK         62 degrees C / 143 degrees F
      CB 0 Exhaust A                 OK         45 degrees C / 113 degrees F
      CB 0 Exhaust B                 OK         41 degrees C / 105 degrees F
      CB 1 Exhaust A                 OK         39 degrees C / 102 degrees F
      CB 1 Exhaust B                 OK         36 degrees C / 96 degrees F
```

show chassis environment monitored (MX2010 Router)

```
user@host > show chassis environment monitored
Class Item                           Status     Measurement
Temp  CB 0 IntakeA-Zone0             OK         37 degrees C / 98 degrees F
      CB 0 IntakeB-Zone1             OK         31 degrees C / 87 degrees F
      CB 0 IntakeC-Zone0             OK         39 degrees C / 102 degrees F
      CB 0 ExhaustA-Zone0            OK         36 degrees C / 96 degrees F
      CB 0 ExhaustB-Zone1            OK         32 degrees C / 89 degrees F
      CB 0 TCBC-Zone0                OK         34 degrees C / 93 degrees F
      CB 1 IntakeA-Zone0             OK         36 degrees C / 96 degrees F
      CB 1 IntakeB-Zone1             OK         28 degrees C / 82 degrees F
      CB 1 IntakeC-Zone0             OK         38 degrees C / 100 degrees F
      CB 1 ExhaustA-Zone0            OK         36 degrees C / 96 degrees F
      CB 1 ExhaustB-Zone1            OK         30 degrees C / 86 degrees F
      CB 1 TCBC-Zone0                OK         33 degrees C / 91 degrees F
      SPMB 0 Intake                  OK         30 degrees C / 86 degrees F
      SPMB 1 Intake                  OK         28 degrees C / 82 degrees F
      Routing Engine 0 CPU           OK         32 degrees C / 89 degrees F
      Routing Engine 1 CPU           Present
      SFB 0 Intake-Zone0             OK         46 degrees C / 114 degrees F
      SFB 0 Exhaust-Zone1            OK         38 degrees C / 100 degrees F
      SFB 0 IntakeA-Zone0            OK         35 degrees C / 95 degrees F
      SFB 0 IntakeB-Zone1            OK         31 degrees C / 87 degrees F
      SFB 0 Exhaust-Zone0            OK         39 degrees C / 102 degrees F
      SFB 0 SFB-XF2-Zone1            OK         44 degrees C / 111 degrees F
      SFB 0 SFB-XF1-Zone0            OK         47 degrees C / 116 degrees F
      SFB 0 SFB-XF0-Zone0            OK         56 degrees C / 132 degrees F
      SFB 1 Intake-Zone0             OK         34 degrees C / 93 degrees F
      SFB 1 Exhaust-Zone1            OK         34 degrees C / 93 degrees F
      SFB 1 IntakeA-Zone0            OK         29 degrees C / 84 degrees F
      SFB 1 IntakeB-Zone1            OK         29 degrees C / 84 degrees F
      SFB 1 Exhaust-Zone0            OK         32 degrees C / 89 degrees F
      SFB 1 SFB-XF2-Zone1            OK         42 degrees C / 107 degrees F
      SFB 1 SFB-XF1-Zone0            OK         40 degrees C / 104 degrees F
      SFB 1 SFB-XF0-Zone0            OK         42 degrees C / 107 degrees F
      SFB 2 Intake-Zone0             OK         33 degrees C / 91 degrees F
      SFB 2 Exhaust-Zone1            OK         33 degrees C / 91 degrees F
      SFB 2 IntakeA-Zone0            OK         28 degrees C / 82 degrees F
      SFB 2 IntakeB-Zone1            OK         28 degrees C / 82 degrees F
      SFB 2 Exhaust-Zone0            OK         31 degrees C / 87 degrees F
      SFB 2 SFB-XF2-Zone1            OK         41 degrees C / 105 degrees F
      SFB 2 SFB-XF1-Zone0            OK         39 degrees C / 102 degrees F
      SFB 2 SFB-XF0-Zone0            OK         42 degrees C / 107 degrees F
      SFB 3 Intake-Zone0             OK         33 degrees C / 91 degrees F
      SFB 3 Exhaust-Zone1            OK         33 degrees C / 91 degrees F
      SFB 3 IntakeA-Zone0            OK         29 degrees C / 84 degrees F
      SFB 3 IntakeB-Zone1            OK         28 degrees C / 82 degrees F
      SFB 3 Exhaust-Zone0            OK         31 degrees C / 87 degrees F
      SFB 3 SFB-XF2-Zone1            OK         43 degrees C / 109 degrees F
      SFB 3 SFB-XF1-Zone0            OK         40 degrees C / 104 degrees F
      SFB 3 SFB-XF0-Zone0            OK         42 degrees C / 107 degrees F
```

```
SFB 4 Intake-Zone0              OK          34 degrees C / 93 degrees F
SFB 4 Exhaust-Zone1             OK          34 degrees C / 93 degrees F
SFB 4 IntakeA-Zone0             OK          29 degrees C / 84 degrees F
SFB 4 IntakeB-Zone1             OK          28 degrees C / 82 degrees F
SFB 4 Exhaust-Zone0             OK          32 degrees C / 89 degrees F
SFB 4 SFB-XF2-Zone1             OK          43 degrees C / 109 degrees F
SFB 4 SFB-XF1-Zone0             OK          42 degrees C / 107 degrees F
SFB 4 SFB-XF0-Zone0             OK          43 degrees C / 109 degrees F
SFB 5 Intake-Zone0              OK          34 degrees C / 93 degrees F
SFB 5 Exhaust-Zone1             OK          34 degrees C / 93 degrees F
SFB 5 IntakeA-Zone0             OK          30 degrees C / 86 degrees F
SFB 5 IntakeB-Zone1             OK          28 degrees C / 82 degrees F
SFB 5 Exhaust-Zone0             OK          32 degrees C / 89 degrees F
SFB 5 SFB-XF2-Zone1             OK          41 degrees C / 105 degrees F
SFB 5 SFB-XF1-Zone0             OK          41 degrees C / 105 degrees F
SFB 5 SFB-XF0-Zone0             OK          44 degrees C / 111 degrees F
SFB 6 Intake-Zone0              OK          35 degrees C / 95 degrees F
SFB 6 Exhaust-Zone1             OK          34 degrees C / 93 degrees F
SFB 6 IntakeA-Zone0             OK          30 degrees C / 86 degrees F
SFB 6 IntakeB-Zone1             OK          29 degrees C / 84 degrees F
SFB 6 Exhaust-Zone0             OK          33 degrees C / 91 degrees F
SFB 6 SFB-XF2-Zone1             OK          44 degrees C / 111 degrees F
SFB 6 SFB-XF1-Zone0             OK          43 degrees C / 109 degrees F
SFB 6 SFB-XF0-Zone0             OK          46 degrees C / 114 degrees F
SFB 7 Intake-Zone0              OK          39 degrees C / 102 degrees F
SFB 7 Exhaust-Zone1             OK          34 degrees C / 93 degrees F
SFB 7 IntakeA-Zone0             OK          34 degrees C / 93 degrees F
SFB 7 IntakeB-Zone1             OK          29 degrees C / 84 degrees F
SFB 7 Exhaust-Zone0             OK          37 degrees C / 98 degrees F
SFB 7 SFB-XF2-Zone1             OK          43 degrees C / 109 degrees F
SFB 7 SFB-XF1-Zone0             OK          47 degrees C / 116 degrees F
SFB 7 SFB-XF0-Zone0             OK          52 degrees C / 125 degrees F
FPC 0 Intake                    OK          36 degrees C / 96 degrees F
FPC 0 Exhaust A                 OK          42 degrees C / 107 degrees F
FPC 0 Exhaust B                 OK          51 degrees C / 123 degrees F
FPC 0 LU 0 TSen                 OK          49 degrees C / 120 degrees F
FPC 0 LU 0 Chip                 OK          50 degrees C / 122 degrees F
FPC 0 LU 1 TSen                 OK          49 degrees C / 120 degrees F
FPC 0 LU 1 Chip                 OK          54 degrees C / 129 degrees F
FPC 0 LU 2 TSen                 OK          49 degrees C / 120 degrees F
FPC 0 LU 2 Chip                 OK          45 degrees C / 113 degrees F
FPC 0 LU 3 TSen                 OK          49 degrees C / 120 degrees F
FPC 0 LU 3 Chip                 OK          46 degrees C / 114 degrees F
FPC 0 MQ 0 TSen                 OK          40 degrees C / 104 degrees F
FPC 0 MQ 0 Chip                 OK          41 degrees C / 105 degrees F
FPC 0 MQ 1 TSen                 OK          40 degrees C / 104 degrees F
FPC 0 MQ 1 Chip                 OK          44 degrees C / 111 degrees F
FPC 0 MQ 2 TSen                 OK          40 degrees C / 104 degrees F
FPC 0 MQ 2 Chip                 OK          38 degrees C / 100 degrees F
FPC 0 MQ 3 TSen                 OK          40 degrees C / 104 degrees F
FPC 0 MQ 3 Chip                 OK          41 degrees C / 105 degrees F
FPC 1 Intake                    OK          34 degrees C / 93 degrees F
FPC 1 Exhaust A                 OK          46 degrees C / 114 degrees F
FPC 1 Exhaust B                 OK          54 degrees C / 129 degrees F
FPC 1 LU 0 TSen                 OK          45 degrees C / 113 degrees F
FPC 1 LU 0 Chip                 OK          55 degrees C / 131 degrees F
FPC 1 LU 1 TSen                 OK          45 degrees C / 113 degrees F
FPC 1 LU 1 Chip                 OK          44 degrees C / 111 degrees F
FPC 1 LU 2 TSen                 OK          45 degrees C / 113 degrees F
FPC 1 LU 2 Chip                 OK          50 degrees C / 122 degrees F
FPC 1 LU 3 TSen                 OK          45 degrees C / 113 degrees F
```



```
FPC 1 LU 3 Chip               OK          58 degrees C / 136 degrees F
FPC 1 XM 0 TSen               OK          45 degrees C / 113 degrees F
FPC 1 XM 0 Chip               OK          52 degrees C / 125 degrees F
FPC 1 XF 0 TSen               OK          45 degrees C / 113 degrees F
FPC 1 XF 0 Chip               OK          63 degrees C / 145 degrees F
FPC 1 PLX Switch TSen         OK          45 degrees C / 113 degrees F
FPC 1 PLX Switch Chip         OK          47 degrees C / 116 degrees F
FPC 8 Intake                  OK          32 degrees C / 89 degrees F
FPC 8 Exhaust A               OK          44 degrees C / 111 degrees F
FPC 8 Exhaust B               OK          37 degrees C / 98 degrees F
FPC 8 LU 0 TCAM TSen          OK          41 degrees C / 105 degrees F
FPC 8 LU 0 TCAM Chip          OK          49 degrees C / 120 degrees F
FPC 8 LU 0 TSen               OK          41 degrees C / 105 degrees F
FPC 8 LU 0 Chip               OK          52 degrees C / 125 degrees F
FPC 8 MQ 0 TSen               OK          41 degrees C / 105 degrees F
FPC 8 MQ 0 Chip               OK          47 degrees C / 116 degrees F
FPC 8 LU 1 TCAM TSen          OK          39 degrees C / 102 degrees F
FPC 8 LU 1 TCAM Chip          OK          42 degrees C / 107 degrees F
FPC 8 LU 1 TSen               OK          39 degrees C / 102 degrees F
FPC 8 LU 1 Chip               OK          46 degrees C / 114 degrees F
FPC 8 MQ 1 TSen               OK          39 degrees C / 102 degrees F
FPC 8 MQ 1 Chip               OK          45 degrees C / 113 degrees F
FPC 9 Intake                  OK          34 degrees C / 93 degrees F
FPC 9 Exhaust A               OK          41 degrees C / 105 degrees F
FPC 9 Exhaust B               OK          54 degrees C / 129 degrees F
FPC 9 LU 0 TSen               OK          51 degrees C / 123 degrees F
FPC 9 LU 0 Chip               OK          52 degrees C / 125 degrees F
FPC 9 LU 1 TSen               OK          51 degrees C / 123 degrees F
FPC 9 LU 1 Chip               OK          55 degrees C / 131 degrees F
FPC 9 LU 2 TSen               OK          51 degrees C / 123 degrees F
FPC 9 LU 2 Chip               OK          47 degrees C / 116 degrees F
FPC 9 LU 3 TSen               OK          51 degrees C / 123 degrees F
FPC 9 LU 3 Chip               OK          47 degrees C / 116 degrees F
FPC 9 MQ 0 TSen               OK          40 degrees C / 104 degrees F
FPC 9 MQ 0 Chip               OK          42 degrees C / 107 degrees F
FPC 9 MQ 1 TSen               OK          40 degrees C / 104 degrees F
FPC 9 MQ 1 Chip               OK          44 degrees C / 111 degrees F
FPC 9 MQ 2 TSen               OK          40 degrees C / 104 degrees F
FPC 9 MQ 2 Chip               OK          38 degrees C / 100 degrees F
FPC 9 MQ 3 TSen               OK          40 degrees C / 104 degrees F
FPC 9 MQ 3 Chip               OK          40 degrees C / 104 degrees F
ADC 0 Intake                  OK          35 degrees C / 95 degrees F
ADC 0 Exhaust                 OK          44 degrees C / 111 degrees F
ADC 0 ADC-XF1                 OK          48 degrees C / 118 degrees F
ADC 0 ADC-XF0                 OK          59 degrees C / 138 degrees F
ADC 1 Intake                  OK          34 degrees C / 93 degrees F
ADC 1 Exhaust                 OK          45 degrees C / 113 degrees F
ADC 1 ADC-XF1                 OK          53 degrees C / 127 degrees F
ADC 1 ADC-XF0                 OK          56 degrees C / 132 degrees F
ADC 8 Intake                  OK          35 degrees C / 95 degrees F
ADC 8 Exhaust                 OK          41 degrees C / 105 degrees F
ADC 8 ADC-XF1                 OK          52 degrees C / 125 degrees F
ADC 8 ADC-XF0                 OK          55 degrees C / 131 degrees F
ADC 9 Intake                  OK          33 degrees C / 91 degrees F
ADC 9 Exhaust                 OK          42 degrees C / 107 degrees F
ADC 9 ADC-XF1                 OK          55 degrees C / 131 degrees F
ADC 9 ADC-XF0                 OK          56 degrees C / 132 degrees F
```

show chassis environment monitored (MX2020 Router)

`user@host >` **show chassis environment monitored**


```
Class Item                           Status     Measurement
Temp  CB 0 IntakeA-Zone0             OK         44 degrees C / 111 degrees F
      CB 0 IntakeB-Zone1             OK         34 degrees C / 93 degrees F
      CB 0 IntakeC-Zone0             OK         46 degrees C / 114 degrees F
      CB 0 ExhaustA-Zone0            OK         44 degrees C / 111 degrees F
      CB 0 ExhaustB-Zone1            OK         36 degrees C / 96 degrees F
      CB 0 TCBC-Zone0                OK         39 degrees C / 102 degrees F
      CB 1 IntakeA-Zone0             OK         46 degrees C / 114 degrees F
      CB 1 IntakeB-Zone1             OK         43 degrees C / 109 degrees F
      CB 1 IntakeC-Zone0             OK         47 degrees C / 116 degrees F
      CB 1 ExhaustA-Zone0            OK         45 degrees C / 113 degrees F
      CB 1 ExhaustB-Zone1            OK         42 degrees C / 107 degrees F
      CB 1 TCBC-Zone0                OK         46 degrees C / 114 degrees F
      SPMB 0 Intake                  OK         33 degrees C / 91 degrees F
      SPMB 1 Intake                  OK         43 degrees C / 109 degrees F
      Routing Engine 0 CPU           OK         34 degrees C / 93 degrees F
      Routing Engine 1 CPU           OK         42 degrees C / 107 degrees F
      SFB 0 Intake-Zone0             OK         52 degrees C / 125 degrees F
      SFB 0 Exhaust-Zone1            OK         45 degrees C / 113 degrees F
      SFB 0 IntakeA-Zone0            OK         47 degrees C / 116 degrees F
      SFB 0 IntakeB-Zone1            OK         38 degrees C / 100 degrees F
      SFB 0 Exhaust-Zone0            OK         49 degrees C / 120 degrees F
      SFB 0 SFB-XF2-Zone1            OK         59 degrees C / 138 degrees F
      SFB 0 SFB-XF1-Zone0            OK         65 degrees C / 149 degrees F
      SFB 0 SFB-XF0-Zone0            OK         65 degrees C / 149 degrees F
      SFB 1 Intake-Zone0             OK         53 degrees C / 127 degrees F
      SFB 1 Exhaust-Zone1            OK         45 degrees C / 113 degrees F
      SFB 1 IntakeA-Zone0            OK         48 degrees C / 118 degrees F
      SFB 1 IntakeB-Zone1            OK         39 degrees C / 102 degrees F
      SFB 1 Exhaust-Zone0            OK         48 degrees C / 118 degrees F
      SFB 1 SFB-XF2-Zone1            OK         60 degrees C / 140 degrees F
      SFB 1 SFB-XF1-Zone0            OK         64 degrees C / 147 degrees F
      SFB 1 SFB-XF0-Zone0            OK         66 degrees C / 150 degrees F
      SFB 2 Intake-Zone0             OK         54 degrees C / 129 degrees F
      SFB 2 Exhaust-Zone1            OK         46 degrees C / 114 degrees F
      SFB 2 IntakeA-Zone0            OK         48 degrees C / 118 degrees F
      SFB 2 IntakeB-Zone1            OK         39 degrees C / 102 degrees F
      SFB 2 Exhaust-Zone0            OK         50 degrees C / 122 degrees F
      SFB 2 SFB-XF2-Zone1            OK         63 degrees C / 145 degrees F
      SFB 2 SFB-XF1-Zone0            OK         67 degrees C / 152 degrees F
      SFB 2 SFB-XF0-Zone0            OK         67 degrees C / 152 degrees F
      SFB 3 Intake-Zone0             OK         54 degrees C / 129 degrees F
      SFB 3 Exhaust-Zone1            OK         46 degrees C / 114 degrees F
      SFB 3 IntakeA-Zone0            OK         50 degrees C / 122 degrees F
      SFB 3 IntakeB-Zone1            OK         40 degrees C / 104 degrees F
      SFB 3 Exhaust-Zone0            OK         50 degrees C / 122 degrees F
      SFB 3 SFB-XF2-Zone1            OK         64 degrees C / 147 degrees F
      SFB 3 SFB-XF1-Zone0            OK         66 degrees C / 150 degrees F
      SFB 3 SFB-XF0-Zone0            OK         68 degrees C / 154 degrees F
      SFB 4 Intake-Zone0             OK         55 degrees C / 131 degrees F
      SFB 4 Exhaust-Zone1            OK         48 degrees C / 118 degrees F
      SFB 4 IntakeA-Zone0            OK         51 degrees C / 123 degrees F
      SFB 4 IntakeB-Zone1            OK         42 degrees C / 107 degrees F
      SFB 4 Exhaust-Zone0            OK         51 degrees C / 123 degrees F
      SFB 4 SFB-XF2-Zone1            OK         63 degrees C / 145 degrees F
      SFB 4 SFB-XF1-Zone0            OK         66 degrees C / 150 degrees F
      SFB 4 SFB-XF0-Zone0            OK         68 degrees C / 154 degrees F
      SFB 5 Intake-Zone0             OK         55 degrees C / 131 degrees F
      SFB 5 Exhaust-Zone1            OK         49 degrees C / 120 degrees F
      SFB 5 IntakeA-Zone0            OK         51 degrees C / 123 degrees F
      SFB 5 IntakeB-Zone1            OK         43 degrees C / 109 degrees F
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SFB 5 Exhaust-Zone0          OK          51 degrees C / 123 degrees F
SFB 5 SFB-XF2-Zone1          OK          65 degrees C / 149 degrees F
SFB 5 SFB-XF1-Zone0          OK          66 degrees C / 150 degrees F
SFB 5 SFB-XF0-Zone0          OK          71 degrees C / 159 degrees F
SFB 6 Intake-Zone0           OK          55 degrees C / 131 degrees F
SFB 6 Exhaust-Zone1          OK          49 degrees C / 120 degrees F
SFB 6 IntakeA-Zone0          OK          51 degrees C / 123 degrees F
SFB 6 IntakeB-Zone1          OK          43 degrees C / 109 degrees F
SFB 6 Exhaust-Zone0          OK          51 degrees C / 123 degrees F
SFB 6 SFB-XF2-Zone1          OK          64 degrees C / 147 degrees F
SFB 6 SFB-XF1-Zone0          OK          66 degrees C / 150 degrees F
SFB 6 SFB-XF0-Zone0          OK          68 degrees C / 154 degrees F
SFB 7 Intake-Zone0           OK          55 degrees C / 131 degrees F
SFB 7 Exhaust-Zone1          OK          49 degrees C / 120 degrees F
SFB 7 IntakeA-Zone0          OK          51 degrees C / 123 degrees F
SFB 7 IntakeB-Zone1          OK          43 degrees C / 109 degrees F
SFB 7 Exhaust-Zone0          OK          52 degrees C / 125 degrees F
SFB 7 SFB-XF2-Zone1          OK          66 degrees C / 150 degrees F
SFB 7 SFB-XF1-Zone0          OK          67 degrees C / 152 degrees F
SFB 7 SFB-XF0-Zone0          OK          70 degrees C / 158 degrees F
FPC 0 Intake                 OK          41 degrees C / 105 degrees F
FPC 0 Exhaust A              OK          48 degrees C / 118 degrees F
FPC 0 Exhaust B              OK          60 degrees C / 140 degrees F
FPC 0 LU 0 TSen              OK          56 degrees C / 132 degrees F
FPC 0 LU 0 Chip              OK          59 degrees C / 138 degrees F
FPC 0 LU 1 TSen              OK          56 degrees C / 132 degrees F
FPC 0 LU 1 Chip              OK          61 degrees C / 141 degrees F
FPC 0 LU 2 TSen              OK          56 degrees C / 132 degrees F
FPC 0 LU 2 Chip              OK          52 degrees C / 125 degrees F
FPC 0 LU 3 TSen              OK          56 degrees C / 132 degrees F
FPC 0 LU 3 Chip              OK          52 degrees C / 125 degrees F
FPC 0 MQ 0 TSen              OK          49 degrees C / 120 degrees F
FPC 0 MQ 0 Chip              OK          49 degrees C / 120 degrees F
FPC 0 MQ 1 TSen              OK          49 degrees C / 120 degrees F
FPC 0 MQ 1 Chip              OK          52 degrees C / 125 degrees F
FPC 0 MQ 2 TSen              OK          49 degrees C / 120 degrees F
FPC 0 MQ 2 Chip              OK          45 degrees C / 113 degrees F
FPC 0 MQ 3 TSen              OK          49 degrees C / 120 degrees F
FPC 0 MQ 3 Chip              OK          46 degrees C / 114 degrees F
FPC 1 Intake                 OK          39 degrees C / 102 degrees F
FPC 1 Exhaust A              OK          48 degrees C / 118 degrees F
FPC 1 Exhaust B              OK          55 degrees C / 131 degrees F
FPC 1 LU 0 TSen              OK          52 degrees C / 125 degrees F
FPC 1 LU 0 Chip              OK          54 degrees C / 129 degrees F
FPC 1 LU 1 TSen              OK          52 degrees C / 125 degrees F
FPC 1 LU 1 Chip              OK          56 degrees C / 132 degrees F
FPC 1 LU 2 TSen              OK          52 degrees C / 125 degrees F
FPC 1 LU 2 Chip              OK          49 degrees C / 120 degrees F
FPC 1 LU 3 TSen              OK          52 degrees C / 125 degrees F
FPC 1 LU 3 Chip              OK          50 degrees C / 122 degrees F
FPC 1 MQ 0 TSen              OK          48 degrees C / 118 degrees F
FPC 1 MQ 0 Chip              OK          48 degrees C / 118 degrees F
FPC 1 MQ 1 TSen              OK          48 degrees C / 118 degrees F
FPC 1 MQ 1 Chip              OK          51 degrees C / 123 degrees F
FPC 1 MQ 2 TSen              OK          48 degrees C / 118 degrees F
FPC 1 MQ 2 Chip              OK          45 degrees C / 113 degrees F
FPC 1 MQ 3 TSen              OK          48 degrees C / 118 degrees F
FPC 1 MQ 3 Chip              OK          45 degrees C / 113 degrees F
FPC 2 Intake                 OK          39 degrees C / 102 degrees F
FPC 2 Exhaust A              OK          48 degrees C / 118 degrees F
FPC 2 Exhaust B              OK          58 degrees C / 136 degrees F
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FPC 2 LU 0 TSen              OK         55 degrees C / 131 degrees F
FPC 2 LU 0 Chip              OK         57 degrees C / 134 degrees F
FPC 2 LU 1 TSen              OK         55 degrees C / 131 degrees F
FPC 2 LU 1 Chip              OK         63 degrees C / 145 degrees F
FPC 2 LU 2 TSen              OK         55 degrees C / 131 degrees F
FPC 2 LU 2 Chip              OK         51 degrees C / 123 degrees F
FPC 2 LU 3 TSen              OK         55 degrees C / 131 degrees F
FPC 2 LU 3 Chip              OK         52 degrees C / 125 degrees F
FPC 2 MQ 0 TSen              OK         48 degrees C / 118 degrees F
FPC 2 MQ 0 Chip              OK         50 degrees C / 122 degrees F
FPC 2 MQ 1 TSen              OK         48 degrees C / 118 degrees F
FPC 2 MQ 1 Chip              OK         52 degrees C / 125 degrees F
FPC 2 MQ 2 TSen              OK         48 degrees C / 118 degrees F
FPC 2 MQ 2 Chip              OK         47 degrees C / 116 degrees F
FPC 2 MQ 3 TSen              OK         48 degrees C / 118 degrees F
FPC 2 MQ 3 Chip              OK         47 degrees C / 116 degrees F
FPC 3 Intake                 OK         41 degrees C / 105 degrees F
FPC 3 Exhaust A              OK         48 degrees C / 118 degrees F
FPC 3 Exhaust B              OK         58 degrees C / 136 degrees F
FPC 3 LU 0 TSen              OK         56 degrees C / 132 degrees F
FPC 3 LU 0 Chip              OK         59 degrees C / 138 degrees F
FPC 3 LU 1 TSen              OK         56 degrees C / 132 degrees F
FPC 3 LU 1 Chip              OK         61 degrees C / 141 degrees F
FPC 3 LU 2 TSen              OK         56 degrees C / 132 degrees F
FPC 3 LU 2 Chip              OK         51 degrees C / 123 degrees F
FPC 3 LU 3 TSen              OK         56 degrees C / 132 degrees F
FPC 3 LU 3 Chip              OK         53 degrees C / 127 degrees F
FPC 3 MQ 0 TSen              OK         50 degrees C / 122 degrees F
FPC 3 MQ 0 Chip              OK         51 degrees C / 123 degrees F
FPC 3 MQ 1 TSen              OK         50 degrees C / 122 degrees F
FPC 3 MQ 1 Chip              OK         55 degrees C / 131 degrees F
FPC 3 MQ 2 TSen              OK         50 degrees C / 122 degrees F
FPC 3 MQ 2 Chip              OK         47 degrees C / 116 degrees F
FPC 3 MQ 3 TSen              OK         50 degrees C / 122 degrees F
FPC 3 MQ 3 Chip              OK         50 degrees C / 122 degrees F
FPC 4 Intake                 OK         41 degrees C / 105 degrees F
FPC 4 Exhaust A              OK         48 degrees C / 118 degrees F
FPC 4 Exhaust B              OK         59 degrees C / 138 degrees F
FPC 4 LU 0 TSen              OK         56 degrees C / 132 degrees F
FPC 4 LU 0 Chip              OK         60 degrees C / 140 degrees F
FPC 4 LU 1 TSen              OK         56 degrees C / 132 degrees F
FPC 4 LU 1 Chip              OK         64 degrees C / 147 degrees F
FPC 4 LU 2 TSen              OK         56 degrees C / 132 degrees F
FPC 4 LU 2 Chip              OK         51 degrees C / 123 degrees F
FPC 4 LU 3 TSen              OK         56 degrees C / 132 degrees F
FPC 4 LU 3 Chip              OK         54 degrees C / 129 degrees F
FPC 4 MQ 0 TSen              OK         49 degrees C / 120 degrees F
FPC 4 MQ 0 Chip              OK         53 degrees C / 127 degrees F
FPC 4 MQ 1 TSen              OK         49 degrees C / 120 degrees F
FPC 4 MQ 1 Chip              OK         55 degrees C / 131 degrees F
FPC 4 MQ 2 TSen              OK         49 degrees C / 120 degrees F
FPC 4 MQ 2 Chip              OK         48 degrees C / 118 degrees F
FPC 4 MQ 3 TSen              OK         49 degrees C / 120 degrees F
FPC 4 MQ 3 Chip              OK         49 degrees C / 120 degrees F
FPC 5 Intake                 OK         42 degrees C / 107 degrees F
FPC 5 Exhaust A              OK         49 degrees C / 120 degrees F
FPC 5 Exhaust B              OK         61 degrees C / 141 degrees F
FPC 5 LU 0 TSen              OK         58 degrees C / 136 degrees F
FPC 5 LU 0 Chip              OK         61 degrees C / 141 degrees F
FPC 5 LU 1 TSen              OK         58 degrees C / 136 degrees F
FPC 5 LU 1 Chip              OK         64 degrees C / 147 degrees F
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FPC 5 LU 2 TSen              OK          58 degrees C / 136 degrees F
FPC 5 LU 2 Chip              OK          56 degrees C / 132 degrees F
FPC 5 LU 3 TSen              OK          58 degrees C / 136 degrees F
FPC 5 LU 3 Chip              OK          54 degrees C / 129 degrees F
FPC 5 MQ 0 TSen              OK          51 degrees C / 123 degrees F
FPC 5 MQ 0 Chip              OK          53 degrees C / 127 degrees F
FPC 5 MQ 1 TSen              OK          51 degrees C / 123 degrees F
FPC 5 MQ 1 Chip              OK          55 degrees C / 131 degrees F
FPC 5 MQ 2 TSen              OK          51 degrees C / 123 degrees F
FPC 5 MQ 2 Chip              OK          50 degrees C / 122 degrees F
FPC 5 MQ 3 TSen              OK          51 degrees C / 123 degrees F
FPC 5 MQ 3 Chip              OK          49 degrees C / 120 degrees F
FPC 6 Intake                 OK          42 degrees C / 107 degrees F
FPC 6 Exhaust A              OK          50 degrees C / 122 degrees F
FPC 6 Exhaust B              OK          61 degrees C / 141 degrees F
FPC 6 LU 0 TSen              OK          58 degrees C / 136 degrees F
FPC 6 LU 0 Chip              OK          62 degrees C / 143 degrees F
FPC 6 LU 1 TSen              OK          58 degrees C / 136 degrees F
FPC 6 LU 1 Chip              OK          64 degrees C / 147 degrees F
FPC 6 LU 2 TSen              OK          58 degrees C / 136 degrees F
FPC 6 LU 2 Chip              OK          56 degrees C / 132 degrees F
FPC 6 LU 3 TSen              OK          58 degrees C / 136 degrees F
FPC 6 LU 3 Chip              OK          56 degrees C / 132 degrees F
FPC 6 MQ 0 TSen              OK          51 degrees C / 123 degrees F
FPC 6 MQ 0 Chip              OK          58 degrees C / 136 degrees F
FPC 6 MQ 1 TSen              OK          51 degrees C / 123 degrees F
FPC 6 MQ 1 Chip              OK          61 degrees C / 141 degrees F
FPC 6 MQ 2 TSen              OK          51 degrees C / 123 degrees F
FPC 6 MQ 2 Chip              OK          51 degrees C / 123 degrees F
FPC 6 MQ 3 TSen              OK          51 degrees C / 123 degrees F
FPC 6 MQ 3 Chip              OK          51 degrees C / 123 degrees F
FPC 7 Intake                 OK          42 degrees C / 107 degrees F
FPC 7 Exhaust A              OK          50 degrees C / 122 degrees F
FPC 7 Exhaust B              OK          61 degrees C / 141 degrees F
FPC 7 LU 0 TSen              OK          58 degrees C / 136 degrees F
FPC 7 LU 0 Chip              OK          59 degrees C / 138 degrees F
FPC 7 LU 1 TSen              OK          58 degrees C / 136 degrees F
FPC 7 LU 1 Chip              OK          64 degrees C / 147 degrees F
FPC 7 LU 2 TSen              OK          58 degrees C / 136 degrees F
FPC 7 LU 2 Chip              OK          54 degrees C / 129 degrees F
FPC 7 LU 3 TSen              OK          58 degrees C / 136 degrees F
FPC 7 LU 3 Chip              OK          53 degrees C / 127 degrees F
FPC 7 MQ 0 TSen              OK          51 degrees C / 123 degrees F
FPC 7 MQ 0 Chip              OK          53 degrees C / 127 degrees F
FPC 7 MQ 1 TSen              OK          51 degrees C / 123 degrees F
FPC 7 MQ 1 Chip              OK          54 degrees C / 129 degrees F
FPC 7 MQ 2 TSen              OK          51 degrees C / 123 degrees F
FPC 7 MQ 2 Chip              OK          48 degrees C / 118 degrees F
FPC 7 MQ 3 TSen              OK          51 degrees C / 123 degrees F
FPC 7 MQ 3 Chip              OK          48 degrees C / 118 degrees F
FPC 8 Intake                 OK          42 degrees C / 107 degrees F
FPC 8 Exhaust A              OK          50 degrees C / 122 degrees F
FPC 8 Exhaust B              OK          61 degrees C / 141 degrees F
FPC 8 LU 0 TSen              OK          58 degrees C / 136 degrees F
FPC 8 LU 0 Chip              OK          63 degrees C / 145 degrees F
FPC 8 LU 1 TSen              OK          58 degrees C / 136 degrees F
FPC 8 LU 1 Chip              OK          65 degrees C / 149 degrees F
FPC 8 LU 2 TSen              OK          58 degrees C / 136 degrees F
FPC 8 LU 2 Chip              OK          56 degrees C / 132 degrees F
FPC 8 LU 3 TSen              OK          58 degrees C / 136 degrees F
FPC 8 LU 3 Chip              OK          56 degrees C / 132 degrees F
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FPC 8 MQ 0 TSen              OK          50 degrees C / 122 degrees F
FPC 8 MQ 0 Chip              OK          53 degrees C / 127 degrees F
FPC 8 MQ 1 TSen              OK          50 degrees C / 122 degrees F
FPC 8 MQ 1 Chip              OK          58 degrees C / 136 degrees F
FPC 8 MQ 2 TSen              OK          50 degrees C / 122 degrees F
FPC 8 MQ 2 Chip              OK          48 degrees C / 118 degrees F
FPC 8 MQ 3 TSen              OK          50 degrees C / 122 degrees F
FPC 8 MQ 3 Chip              OK          49 degrees C / 120 degrees F
FPC 9 Intake                 OK          43 degrees C / 109 degrees F
FPC 9 Exhaust A              OK          51 degrees C / 123 degrees F
FPC 9 Exhaust B              OK          61 degrees C / 141 degrees F
FPC 9 LU 0 TSen              OK          58 degrees C / 136 degrees F
FPC 9 LU 0 Chip              OK          61 degrees C / 141 degrees F
FPC 9 LU 1 TSen              OK          58 degrees C / 136 degrees F
FPC 9 LU 1 Chip              OK          63 degrees C / 145 degrees F
FPC 9 LU 2 TSen              OK          58 degrees C / 136 degrees F
FPC 9 LU 2 Chip              OK          55 degrees C / 131 degrees F
FPC 9 LU 3 TSen              OK          58 degrees C / 136 degrees F
FPC 9 LU 3 Chip              OK          54 degrees C / 129 degrees F
FPC 9 MQ 0 TSen              OK          52 degrees C / 125 degrees F
FPC 9 MQ 0 Chip              OK          53 degrees C / 127 degrees F
FPC 9 MQ 1 TSen              OK          52 degrees C / 125 degrees F
FPC 9 MQ 1 Chip              OK          54 degrees C / 129 degrees F
FPC 9 MQ 2 TSen              OK          52 degrees C / 125 degrees F
FPC 9 MQ 2 Chip              OK          48 degrees C / 118 degrees F
FPC 9 MQ 3 TSen              OK          52 degrees C / 125 degrees F
FPC 9 MQ 3 Chip              OK          49 degrees C / 120 degrees F
FPC 10 Intake                OK          44 degrees C / 111 degrees F
FPC 10 Exhaust A             OK          48 degrees C / 118 degrees F
FPC 10 Exhaust B             OK          54 degrees C / 129 degrees F
FPC 10 LU 0 TSen             OK          53 degrees C / 127 degrees F
FPC 10 LU 0 Chip             OK          54 degrees C / 129 degrees F
FPC 10 LU 1 TSen             OK          53 degrees C / 127 degrees F
FPC 10 LU 1 Chip             OK          58 degrees C / 136 degrees F
FPC 10 LU 2 TSen             OK          53 degrees C / 127 degrees F
FPC 10 LU 2 Chip             OK          51 degrees C / 123 degrees F
FPC 10 LU 3 TSen             OK          53 degrees C / 127 degrees F
FPC 10 LU 3 Chip             OK          51 degrees C / 123 degrees F
FPC 10 MQ 0 TSen             OK          49 degrees C / 120 degrees F
FPC 10 MQ 0 Chip             OK          50 degrees C / 122 degrees F
FPC 10 MQ 1 TSen             OK          49 degrees C / 120 degrees F
FPC 10 MQ 1 Chip             OK          52 degrees C / 125 degrees F
FPC 10 MQ 2 TSen             OK          49 degrees C / 120 degrees F
FPC 10 MQ 2 Chip             OK          48 degrees C / 118 degrees F
FPC 10 MQ 3 TSen             OK          49 degrees C / 120 degrees F
FPC 10 MQ 3 Chip             OK          48 degrees C / 118 degrees F
FPC 11 Intake                OK          39 degrees C / 102 degrees F
FPC 11 Exhaust A             OK          47 degrees C / 116 degrees F
FPC 11 Exhaust B             OK          51 degrees C / 123 degrees F
FPC 11 LU 0 TSen             OK          50 degrees C / 122 degrees F
FPC 11 LU 0 Chip             OK          52 degrees C / 125 degrees F
FPC 11 LU 1 TSen             OK          50 degrees C / 122 degrees F
FPC 11 LU 1 Chip             OK          55 degrees C / 131 degrees F
FPC 11 LU 2 TSen             OK          50 degrees C / 122 degrees F
FPC 11 LU 2 Chip             OK          49 degrees C / 120 degrees F
FPC 11 LU 3 TSen             OK          50 degrees C / 122 degrees F
FPC 11 LU 3 Chip             OK          49 degrees C / 120 degrees F
FPC 11 MQ 0 TSen             OK          47 degrees C / 116 degrees F
FPC 11 MQ 0 Chip             OK          47 degrees C / 116 degrees F
FPC 11 MQ 1 TSen             OK          47 degrees C / 116 degrees F
FPC 11 MQ 1 Chip             OK          51 degrees C / 123 degrees F
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FPC 11 MQ 2 TSen              OK         47 degrees C / 116 degrees F
FPC 11 MQ 2 Chip              OK         45 degrees C / 113 degrees F
FPC 11 MQ 3 TSen              OK         47 degrees C / 116 degrees F
FPC 11 MQ 3 Chip              OK         49 degrees C / 120 degrees F
FPC 12 Intake                 OK         39 degrees C / 102 degrees F
FPC 12 Exhaust A              OK         47 degrees C / 116 degrees F
FPC 12 Exhaust B              OK         50 degrees C / 122 degrees F
FPC 12 LU 0 TSen              OK         49 degrees C / 120 degrees F
FPC 12 LU 0 Chip              OK         51 degrees C / 123 degrees F
FPC 12 LU 1 TSen              OK         49 degrees C / 120 degrees F
FPC 12 LU 1 Chip              OK         54 degrees C / 129 degrees F
FPC 12 LU 2 TSen              OK         49 degrees C / 120 degrees F
FPC 12 LU 2 Chip              OK         47 degrees C / 116 degrees F
FPC 12 LU 3 TSen              OK         49 degrees C / 120 degrees F
FPC 12 LU 3 Chip              OK         49 degrees C / 120 degrees F
FPC 12 MQ 0 TSen              OK         47 degrees C / 116 degrees F
FPC 12 MQ 0 Chip              OK         46 degrees C / 114 degrees F
FPC 12 MQ 1 TSen              OK         47 degrees C / 116 degrees F
FPC 12 MQ 1 Chip              OK         51 degrees C / 123 degrees F
FPC 12 MQ 2 TSen              OK         47 degrees C / 116 degrees F
FPC 12 MQ 2 Chip              OK         45 degrees C / 113 degrees F
FPC 12 MQ 3 TSen              OK         47 degrees C / 116 degrees F
FPC 12 MQ 3 Chip              OK         47 degrees C / 116 degrees F
FPC 13 Intake                 OK         40 degrees C / 104 degrees F
FPC 13 Exhaust A              OK         48 degrees C / 118 degrees F
FPC 13 Exhaust B              OK         51 degrees C / 123 degrees F
FPC 13 LU 0 TSen              OK         50 degrees C / 122 degrees F
FPC 13 LU 0 Chip              OK         52 degrees C / 125 degrees F
FPC 13 LU 1 TSen              OK         50 degrees C / 122 degrees F
FPC 13 LU 1 Chip              OK         54 degrees C / 129 degrees F
FPC 13 LU 2 TSen              OK         50 degrees C / 122 degrees F
FPC 13 LU 2 Chip              OK         48 degrees C / 118 degrees F
FPC 13 LU 3 TSen              OK         50 degrees C / 122 degrees F
FPC 13 LU 3 Chip              OK         48 degrees C / 118 degrees F
FPC 13 MQ 0 TSen              OK         48 degrees C / 118 degrees F
FPC 13 MQ 0 Chip              OK         47 degrees C / 116 degrees F
FPC 13 MQ 1 TSen              OK         48 degrees C / 118 degrees F
FPC 13 MQ 1 Chip              OK         51 degrees C / 123 degrees F
FPC 13 MQ 2 TSen              OK         48 degrees C / 118 degrees F
FPC 13 MQ 2 Chip              OK         46 degrees C / 114 degrees F
FPC 13 MQ 3 TSen              OK         48 degrees C / 118 degrees F
FPC 13 MQ 3 Chip              OK         47 degrees C / 116 degrees F
FPC 14 Intake                 OK         41 degrees C / 105 degrees F
FPC 14 Exhaust A              OK         49 degrees C / 120 degrees F
FPC 14 Exhaust B              OK         50 degrees C / 122 degrees F
FPC 14 LU 0 TSen              OK         49 degrees C / 120 degrees F
FPC 14 LU 0 Chip              OK         50 degrees C / 122 degrees F
FPC 14 LU 1 TSen              OK         49 degrees C / 120 degrees F
FPC 14 LU 1 Chip              OK         54 degrees C / 129 degrees F
FPC 14 LU 2 TSen              OK         49 degrees C / 120 degrees F
FPC 14 LU 2 Chip              OK         48 degrees C / 118 degrees F
FPC 14 LU 3 TSen              OK         49 degrees C / 120 degrees F
FPC 14 LU 3 Chip              OK         50 degrees C / 122 degrees F
FPC 14 MQ 0 TSen              OK         48 degrees C / 118 degrees F
FPC 14 MQ 0 Chip              OK         48 degrees C / 118 degrees F
FPC 14 MQ 1 TSen              OK         48 degrees C / 118 degrees F
FPC 14 MQ 1 Chip              OK         52 degrees C / 125 degrees F
FPC 14 MQ 2 TSen              OK         48 degrees C / 118 degrees F
FPC 14 MQ 2 Chip              OK         47 degrees C / 116 degrees F
FPC 14 MQ 3 TSen              OK         48 degrees C / 118 degrees F
FPC 14 MQ 3 Chip              OK         50 degrees C / 122 degrees F
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FPC 15 Intake              OK        42 degrees C / 107 degrees F
FPC 15 Exhaust A           OK        51 degrees C / 123 degrees F
FPC 15 Exhaust B           OK        52 degrees C / 125 degrees F
FPC 15 LU 0 TSen           OK        52 degrees C / 125 degrees F
FPC 15 LU 0 Chip           OK        55 degrees C / 131 degrees F
FPC 15 LU 1 TSen           OK        52 degrees C / 125 degrees F
FPC 15 LU 1 Chip           OK        59 degrees C / 138 degrees F
FPC 15 LU 2 TSen           OK        52 degrees C / 125 degrees F
FPC 15 LU 2 Chip           OK        50 degrees C / 122 degrees F
FPC 15 LU 3 TSen           OK        52 degrees C / 125 degrees F
FPC 15 LU 3 Chip           OK        51 degrees C / 123 degrees F
FPC 15 MQ 0 TSen           OK        51 degrees C / 123 degrees F
FPC 15 MQ 0 Chip           OK        53 degrees C / 127 degrees F
FPC 15 MQ 1 TSen           OK        51 degrees C / 123 degrees F
FPC 15 MQ 1 Chip           OK        60 degrees C / 140 degrees F
FPC 15 MQ 2 TSen           OK        51 degrees C / 123 degrees F
FPC 15 MQ 2 Chip           OK        52 degrees C / 125 degrees F
FPC 15 MQ 3 TSen           OK        51 degrees C / 123 degrees F
FPC 15 MQ 3 Chip           OK        53 degrees C / 127 degrees F
FPC 16 Intake              OK        44 degrees C / 111 degrees F
FPC 16 Exhaust A           OK        51 degrees C / 123 degrees F
FPC 16 Exhaust B           OK        53 degrees C / 127 degrees F
FPC 16 LU 0 TSen           OK        51 degrees C / 123 degrees F
FPC 16 LU 0 Chip           OK        52 degrees C / 125 degrees F
FPC 16 LU 1 TSen           OK        51 degrees C / 123 degrees F
FPC 16 LU 1 Chip           OK        56 degrees C / 132 degrees F
FPC 16 LU 2 TSen           OK        51 degrees C / 123 degrees F
FPC 16 LU 2 Chip           OK        50 degrees C / 122 degrees F
FPC 16 LU 3 TSen           OK        51 degrees C / 123 degrees F
FPC 16 LU 3 Chip           OK        50 degrees C / 122 degrees F
FPC 16 MQ 0 TSen           OK        51 degrees C / 123 degrees F
FPC 16 MQ 0 Chip           OK        50 degrees C / 122 degrees F
FPC 16 MQ 1 TSen           OK        51 degrees C / 123 degrees F
FPC 16 MQ 1 Chip           OK        55 degrees C / 131 degrees F
FPC 16 MQ 2 TSen           OK        51 degrees C / 123 degrees F
FPC 16 MQ 2 Chip           OK        49 degrees C / 120 degrees F
FPC 16 MQ 3 TSen           OK        51 degrees C / 123 degrees F
FPC 16 MQ 3 Chip           OK        52 degrees C / 125 degrees F
FPC 17 Intake              OK        45 degrees C / 113 degrees F
FPC 17 Exhaust A           OK        52 degrees C / 125 degrees F
FPC 17 Exhaust B           OK        55 degrees C / 131 degrees F
FPC 17 LU 0 TSen           OK        54 degrees C / 129 degrees F
FPC 17 LU 0 Chip           OK        57 degrees C / 134 degrees F
FPC 17 LU 1 TSen           OK        54 degrees C / 129 degrees F
FPC 17 LU 1 Chip           OK        61 degrees C / 141 degrees F
FPC 17 LU 2 TSen           OK        54 degrees C / 129 degrees F
FPC 17 LU 2 Chip           OK        54 degrees C / 129 degrees F
FPC 17 LU 3 TSen           OK        54 degrees C / 129 degrees F
FPC 17 LU 3 Chip           OK        55 degrees C / 131 degrees F
FPC 17 MQ 0 TSen           OK        53 degrees C / 127 degrees F
FPC 17 MQ 0 Chip           OK        53 degrees C / 127 degrees F
FPC 17 MQ 1 TSen           OK        53 degrees C / 127 degrees F
FPC 17 MQ 1 Chip           OK        57 degrees C / 134 degrees F
FPC 17 MQ 2 TSen           OK        53 degrees C / 127 degrees F
FPC 17 MQ 2 Chip           OK        51 degrees C / 123 degrees F
FPC 17 MQ 3 TSen           OK        53 degrees C / 127 degrees F
FPC 17 MQ 3 Chip           OK        54 degrees C / 129 degrees F
FPC 18 Intake              OK        46 degrees C / 114 degrees F
FPC 18 Exhaust A           OK        53 degrees C / 127 degrees F
FPC 18 Exhaust B           OK        57 degrees C / 134 degrees F
FPC 18 LU 0 TSen           OK        56 degrees C / 132 degrees F
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FPC 18 LU 0 Chip               OK          58 degrees C / 136 degrees F
FPC 18 LU 1 TSen               OK          56 degrees C / 132 degrees F
FPC 18 LU 1 Chip               OK          63 degrees C / 145 degrees F
FPC 18 LU 2 TSen               OK          56 degrees C / 132 degrees F
FPC 18 LU 2 Chip               OK          54 degrees C / 129 degrees F
FPC 18 LU 3 TSen               OK          56 degrees C / 132 degrees F
FPC 18 LU 3 Chip               OK          56 degrees C / 132 degrees F
FPC 18 MQ 0 TSen               OK          54 degrees C / 129 degrees F
FPC 18 MQ 0 Chip               OK          57 degrees C / 134 degrees F
FPC 18 MQ 1 TSen               OK          54 degrees C / 129 degrees F
FPC 18 MQ 1 Chip               OK          62 degrees C / 143 degrees F
FPC 18 MQ 2 TSen               OK          54 degrees C / 129 degrees F
FPC 18 MQ 2 Chip               OK          53 degrees C / 127 degrees F
FPC 18 MQ 3 TSen               OK          54 degrees C / 129 degrees F
FPC 18 MQ 3 Chip               OK          56 degrees C / 132 degrees F
FPC 19 Intake                  OK          49 degrees C / 120 degrees F
FPC 19 Exhaust A               OK          56 degrees C / 132 degrees F
FPC 19 Exhaust B               OK          62 degrees C / 143 degrees F
FPC 19 LU 0 TSen               OK          62 degrees C / 143 degrees F
FPC 19 LU 0 Chip               OK          63 degrees C / 145 degrees F
FPC 19 LU 1 TSen               OK          62 degrees C / 143 degrees F
FPC 19 LU 1 Chip               OK          69 degrees C / 156 degrees F
FPC 19 LU 2 TSen               OK          62 degrees C / 143 degrees F
FPC 19 LU 2 Chip               OK          61 degrees C / 141 degrees F
FPC 19 LU 3 TSen               OK          62 degrees C / 143 degrees F
FPC 19 LU 3 Chip               OK          62 degrees C / 143 degrees F
FPC 19 MQ 0 TSen               OK          58 degrees C / 136 degrees F
FPC 19 MQ 0 Chip               OK          62 degrees C / 143 degrees F
FPC 19 MQ 1 TSen               OK          58 degrees C / 136 degrees F
FPC 19 MQ 1 Chip               OK          64 degrees C / 147 degrees F
FPC 19 MQ 2 TSen               OK          58 degrees C / 136 degrees F
FPC 19 MQ 2 Chip               OK          59 degrees C / 138 degrees F
FPC 19 MQ 3 TSen               OK          58 degrees C / 136 degrees F
FPC 19 MQ 3 Chip               OK          60 degrees C / 140 degrees F
ADC 0 Intake                   OK          40 degrees C / 104 degrees F
ADC 0 Exhaust                  OK          50 degrees C / 122 degrees F
ADC 0 ADC-XF1                  OK          58 degrees C / 136 degrees F
ADC 0 ADC-XF0                  OK          63 degrees C / 145 degrees F
ADC 1 Intake                   OK          38 degrees C / 100 degrees F
ADC 1 Exhaust                  OK          48 degrees C / 118 degrees F
ADC 1 ADC-XF1                  OK          59 degrees C / 138 degrees F
ADC 1 ADC-XF0                  OK          61 degrees C / 141 degrees F
ADC 2 Intake                   OK          36 degrees C / 96 degrees F
ADC 2 Exhaust                  OK          50 degrees C / 122 degrees F
ADC 2 ADC-XF1                  OK          53 degrees C / 127 degrees F
ADC 2 ADC-XF0                  OK          59 degrees C / 138 degrees F
ADC 3 Intake                   OK          39 degrees C / 102 degrees F
ADC 3 Exhaust                  OK          49 degrees C / 120 degrees F
ADC 3 ADC-XF1                  OK          61 degrees C / 141 degrees F
ADC 3 ADC-XF0                  OK          62 degrees C / 143 degrees F
ADC 4 Intake                   OK          39 degrees C / 102 degrees F
ADC 4 Exhaust                  OK          49 degrees C / 120 degrees F
ADC 4 ADC-XF1                  OK          60 degrees C / 140 degrees F
ADC 4 ADC-XF0                  OK          61 degrees C / 141 degrees F
ADC 5 Intake                   OK          38 degrees C / 100 degrees F
ADC 5 Exhaust                  OK          52 degrees C / 125 degrees F
ADC 5 ADC-XF1                  OK          55 degrees C / 131 degrees F
ADC 5 ADC-XF0                  OK          65 degrees C / 149 degrees F
ADC 6 Intake                   OK          39 degrees C / 102 degrees F
ADC 6 Exhaust                  OK          51 degrees C / 123 degrees F
ADC 6 ADC-XF1                  OK          58 degrees C / 136 degrees F
```

```
ADC 6 ADC-XF0                  OK          63 degrees C / 145 degrees F
ADC 7 Intake                   OK          39 degrees C / 102 degrees F
ADC 7 Exhaust                  OK          52 degrees C / 125 degrees F
ADC 7 ADC-XF1                  OK          61 degrees C / 141 degrees F
ADC 7 ADC-XF0                  OK          68 degrees C / 154 degrees F
ADC 8 Intake                   OK          39 degrees C / 102 degrees F
ADC 8 Exhaust                  OK          50 degrees C / 122 degrees F
ADC 8 ADC-XF1                  OK          64 degrees C / 147 degrees F
ADC 8 ADC-XF0                  OK          63 degrees C / 145 degrees F
ADC 9 Intake                   OK          41 degrees C / 105 degrees F
ADC 9 Exhaust                  OK          50 degrees C / 122 degrees F
ADC 9 ADC-XF1                  OK          60 degrees C / 140 degrees F
ADC 9 ADC-XF0                  OK          62 degrees C / 143 degrees F
ADC 10 Intake                  OK          46 degrees C / 114 degrees F
ADC 10 Exhaust                 OK          53 degrees C / 127 degrees F
ADC 10 ADC-XF1                 OK          66 degrees C / 150 degrees F
ADC 10 ADC-XF0                 OK          65 degrees C / 149 degrees F
ADC 11 Intake                  OK          46 degrees C / 114 degrees F
ADC 11 Exhaust                 OK          53 degrees C / 127 degrees F
ADC 11 ADC-XF1                 OK          63 degrees C / 145 degrees F
ADC 11 ADC-XF0                 OK          64 degrees C / 147 degrees F
ADC 12 Intake                  OK          47 degrees C / 116 degrees F
ADC 12 Exhaust                 OK          53 degrees C / 127 degrees F
ADC 12 ADC-XF1                 OK          65 degrees C / 149 degrees F
ADC 12 ADC-XF0                 OK          65 degrees C / 149 degrees F
ADC 13 Intake                  OK          48 degrees C / 118 degrees F
ADC 13 Exhaust                 OK          55 degrees C / 131 degrees F
ADC 13 ADC-XF1                 OK          65 degrees C / 149 degrees F
ADC 13 ADC-XF0                 OK          67 degrees C / 152 degrees F
ADC 14 Intake                  OK          49 degrees C / 120 degrees F
ADC 14 Exhaust                 OK          57 degrees C / 134 degrees F
ADC 14 ADC-XF1                 OK          68 degrees C / 154 degrees F
ADC 14 ADC-XF0                 OK          72 degrees C / 161 degrees F
ADC 15 Intake                  OK          50 degrees C / 122 degrees F
ADC 15 Exhaust                 OK          56 degrees C / 132 degrees F
ADC 15 ADC-XF1                 OK          68 degrees C / 154 degrees F
ADC 15 ADC-XF0                 OK          68 degrees C / 154 degrees F
ADC 16 Intake                  OK          51 degrees C / 123 degrees F
ADC 16 Exhaust                 OK          57 degrees C / 134 degrees F
ADC 16 ADC-XF1                 OK          67 degrees C / 152 degrees F
ADC 16 ADC-XF0                 OK          68 degrees C / 154 degrees F
ADC 17 Intake                  OK          51 degrees C / 123 degrees F
ADC 17 Exhaust                 OK          57 degrees C / 134 degrees F
ADC 17 ADC-XF1                 OK          69 degrees C / 156 degrees F
ADC 17 ADC-XF0                 OK          69 degrees C / 156 degrees F
ADC 18 Intake                  OK          52 degrees C / 125 degrees F
ADC 18 Exhaust                 OK          58 degrees C / 136 degrees F
ADC 18 ADC-XF1                 OK          67 degrees C / 152 degrees F
ADC 18 ADC-XF0                 OK          72 degrees C / 161 degrees F
ADC 19 Intake                  OK          50 degrees C / 122 degrees F
ADC 19 Exhaust                 OK          58 degrees C / 136 degrees F
ADC 19 ADC-XF1                 OK          68 degrees C / 154 degrees F
ADC 19 ADC-XF0                 OK          71 degrees C / 159 degrees F
```


show chassis environment pcg

Syntax

show chassis environment pcg
<*slot*>

Release Information

Command introduced before Junos OS Release 7.4.

Description

(M40e and M160 routers only) Display environmental information about the Packet Forwarding Engine clock generators (PCGs).

Options

none—Display environmental information about both PCGs.

slot—(Optional) Display environmental information about an individual PCG. Replace ***slot*** with 0 or 1.

Required Privilege Level

view

Related Documentation

- request chassis pcg on page 643

List of Sample Output

show chassis environment pcg (M40e Router) on page 876
show chassis environment pcg (M160 Router) on page 876

Output Fields

Table 55 on page 875 lists the output fields for the **show chassis environment pcg** command. Output fields are listed in the approximate order in which they appear.

Table 55: show chassis environment pcg Output Fields

Field Name	Field Description
PCG slot status	Slot number: **0** or **1**.
State	Status of PCG: • **Present**—PCG is detected by the chassis process but is either not supported by the current version of Junos OS or PCG is coming up but is not yet online. • **Online**—PCG is powered down. If **Online**, it can be the **Master clock** or the **Standby clock**. • **Offline**—PCG is powered down. • **Empty**—No PCG is present.
Temperature	Temperature of the air flowing past the PCG.
Frequency	Frequency setting and measurement for the PCG.
Power	Information about the voltage supplied to the PCG. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.

Sample Output

show chassis environment pcg (M40e Router)

```
user@host> show chassis environment pcg
PCG 0 status:
  State                            Online -  Master clock
  Temperature                   44 degrees C / 111 degrees F
  Frequency:
   Setting              125.00 MHz
   Measurement          124.95 MHz
  Power:
    3.3 V                  3266 mV
    5.0 V bias             4964 mV
    8.0 V bias             8112 mV
  BUS Revision               12
PCG 1 status:
  State                            Online - Standby
  Temperature                   47 degrees C / 116 degrees F
  Frequency:
   Setting              125.00 MHz
   Measurement          124.96 MHz
  Power:
    3.3 V                  3271 mV
    5.0 V bias             4979 mV
    8.0 V bias             8117 mV
  BUS Revision               12
```

show chassis environment pcg (M160 Router)

```
user@host> show chassis environment pcg
PCG 0 status:
  State                            Online -  Master clock
  Temperature                   41 degrees C / 105 degrees F
  Frequency:
   Setting              125.00 MHz
   Measurement          125.03 MHz
  Power:
    3.3 V                  3286 mV
    5.0 V bias             5010 mV
    8.0 V bias             8183 mV
  BUS Revision               12
PCG 1 status:
  State                            Online - Standby
  Temperature                   43 degrees C / 109 degrees F
  Frequency:
   Setting              125.00 MHz
   Measurement          125.01 MHz
  Power:
    3.3 V                  3288 mV
    5.0 V bias             4993 mV
    8.0 V bias             8197 mV
  BUS Revision               12
```


show chassis environment pdu

Syntax
show chassis environment pdu
<*slot*>

Release Information
Command introduced in Junos OS Release 12.1X48 for PTX5000 Packet Transport Routers.

Description
Display Power Distribution Unit (PDU) environmental status information.

Starting with Junos OS Release 14.1, the **show chassis environment pdu *slot*** operational mode command output displays environmental status information for the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-P1A).

Options
none—Display environmental information about all PDUs.

slot —(Optional) Display environmental information about an individual PDU. For the PTX5000, replace ***slot*** with **0** or **1**.

Required Privilege Level
view

Related Documentation
- *PTX5000 Packet Transport Router Hardware Guide*

List of Sample Output
show chassis environment pdu (PTX5000) on page 878
show chassis environment pdu (PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 879

Output Fields
Table 56 on page 877 lists the output fields for the **show chassis environment pdu** command. Output fields are listed in the approximate order in which they appear.

Table 56: show chassis environment pdu Output Fields

Field Name	Field Description
PDU *slot* status	Number of the PDU slot.
PDU - State	Status of the PDU. Status can be **Online**, **Present**, or **Absent**.
PDU - BoostConv	Status of the booster converter.
PDU - Hours Used	Number of hours the PDU has been operational.
PDU - Firmware Version	Version level of the firmware running on the PDU.
PSM *number* status	PSM number. PSMs are numbered **0** through **3**.
PSM - State	Status of the PSM. Status can be **Online**, **Present**, or **Absent**.

Table 56: show chassis environment pdu Output Fields *(continued)*

Field Name	Field Description
PSM - Temperature	Temperature of the air flowing past the PSM.
PSM - Fans	Status of the cooling fans associated with the PSM.
PSM - AC Input	Status of the AC input for the specified component
PSM - AC Output	Status of the AC output for the specified component.
PSM - DC input	Status of the DC input for the specified component.
PSM - DC output	Status of the DC output for the specified component.
PSM - Hours Used	Number of hours the PSM has been operational.
PSM - Firmware Version	Version level of the firmware running on the PSM.

Sample Output

show chassis environment pdu (PTX5000)

```
user@host> show chassis environment pdu 0
PDU 0 status:
  State                       Online
  Hours Used                  4281
  Firmware Version (MCU1)     00.02
  Firmware Version (MCU2)     00.02
  Firmware Version (MCU3)     00.02
  Firmware Version (MCU4)     00.02
PDU 0 PSM 0 status:
  State                       Online
  Temperature                 OK   32 degrees C / 89 degrees F
  Fans                        OK
  DC Input                    OK
  DC Output                   OK
  Hours Used                  2864
  Firmware Version            00.04
PDU 0 PSM 1 status:
  State                       Online
  Temperature                 OK   30 degrees C / 86 degrees F
  Fans                        OK
  DC Input                    OK
  DC Output                   OK
  Hours Used                  3540
  Firmware Version            00.04
PDU 0 PSM 2 status:
  State                       Online
  Temperature                 OK   29 degrees C / 84 degrees F
  Fans                        OK
  DC Input                    OK
  DC Output                   OK
  Hours Used                  3711
  Firmware Version            00.04
```



```
PDU 0 PSM 3 status:
  State                      Online
  Temperature                OK   29 degrees C / 84 degrees F
  Fans                       OK
  DC Input                   OK
  DC Output                  OK
  Hours Used                 4243
  Firmware Version           00.04
```

show chassis environment pdu (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis environment pdu 1
PDU 1 status:
  State                      Online
  BoostConv                  OK
  Hours Used                 1054
  Firmware Version (MCU1)    03.05
PDU 1 PSM 0 status:
  State                      Empty
PDU 1 PSM 1 status:
  State                      Online
  Temperature                OK   45 degrees C / 113 degrees F
  Fans                       OK
  DC Input                   OK
  DC Output                  OK
  Hours Used                 1027
  Firmware Version           03.07
PDU 1 PSM 2 status:
  State                      Empty
PDU 1 PSM 3 status:
  State                      Online
  Temperature                OK   43 degrees C / 109 degrees F
  Fans                       OK
  DC Input                   OK
  DC Output                  OK
  Hours Used                 1029
  Firmware Version           03.07
PDU 1 PSM 4 status:
  State                      Empty
PDU 1 PSM 5 status:
  State                      Online
  Temperature                OK   46 degrees C / 114 degrees F
  Fans                       OK
  DC Input                   OK
  DC Output                  OK
  Hours Used                 1028
  Firmware Version           03.07
PDU 1 PSM 6 status:
  State                      Empty
PDU 1 PSM 7 status:
  State                      Online
  Temperature                OK   46 degrees C / 114 degrees F
  Fans                       OK
  DC Input                   OK
  DC Output                  OK
  Hours Used                 1030
  Firmware Version           03.07
```


show chassis environment pem

List of Syntax

Syntax

show chassis environment pem
<*slot*>

Syntax (ACX4000 Router)

show chassis environment pem

Syntax (TX Matrix Routers)

show chassis environment pem
<lcc *number* | scc>
<*slot*>

Syntax (TX Matrix Plus Routers)

show chassis environment pem
<lcc *number* | sfc *number*>
<*slot*>

Syntax (MX Series Router)

show chassis environment pem
<*slot*>
<all-members>
<local>
<member *member-id*>

Syntax (MX104 3D Universal Edge Routers)

show chassis environment pem
<*slot*>

Syntax (QFX Series)

show chassis environment pem
<*slot* (interconnect-device *name slot*) | (node-device *name*)>

Syntax (OCX Series)

show chassis environment pem <*slot*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS 11.3 for the QFX Series.
Command introduced in Junos OS 12.3R2 for EX Series.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display Power Entry Module (PEM) environmental status information.

NOTE: The new high-capacity (4100W) enhanced DC PEM on MX960 routers includes a new design that can condition the input voltage. This results in the output voltage differing from the input voltage. The earlier generation of DC PEMs coupled the input power directly to the output, thereby making it safe to assume that the output voltage was equal to the input voltage.

Options

none—Display environmental information about both PEMs. For the TX Matrix router, display environmental information about the PEMs, the TX Matrix router, and its attached T640 routers. For the TX Matrix Plus router, display environmental information about the PEMs, the TX Matrix Plus router, and its attached routers.

all-members—(MX Series routers only) (Optional) Display environmental information about the PEMs in all the member routers of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display chassis environmental information about the PEMs in the Interconnect device.

lcc *number*—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display environmental information about the PEM in the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display environmental information about the PEM in the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device *name*—(QFabric systems only) (Optional) Display chassis environmental information about the PEMs in the Node device.

scc—(TX Matrix routers only) (Optional) Display environmental information about the PEM in the TX Matrix router (switch-card chassis).

sfc—(TX Matrix Plus routers only) (Optional) Display environmental information about the PEM in the TX Matrix Plus router (or switch-fabric chassis).

slot —(Optional) Display environmental information about an individual PEM. Replace ***slot*** with **0** or **1**.

Required Privilege Level view

Related Documentation

- show chassis hardware on page 1253

List of Sample Output

Output Fields Table 57 on page 882 lists the output fields for the **show chassis environment pem** command. Output fields are listed in the approximate order in which they appear.

Table 57: 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 57: 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, MX240, MX480, MX960, T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about voltage supplied to the PEM. (MX104 routers only) Information about voltage supplied by the PEM to the system.
Current	(MX240, MX480, MX960, T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about the PEM current.
Power	(MX240, MX480, MX960, T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about the PEM power.
SCG/CB/SIB	(T640, T1600, TX Matrix, and TX Matrix Plus routers only) SONET Clock Generator/Control Board/Switch Interface Board.
FAN	(T640, T1600, and T4000 routers with six-input DC power supply only) Information about the DC output to the fan.

Sample Output

show chassis environment pem (M40e Router)

```
user@host> show chassis environment pem
PEM 0 status:
  State                               Online
  Temperature                         OK
  AC input                            OK
  DC output                           OK
```

show chassis environment pem (M120 Router)

```
user@host> show chassis environment pem
PEM 0 status:
  State                          Online
  Temperature                    OK
  DC Input:                      OK
  DC Output:                     OK
  Load                           Less than 20 percent
  Voltage:
    48.0 V input                 52864 mV
    48.0 V fan supply            41655 mV
    3.3 V                         3399 mV
PEM 1 status:
  State                          Online
  Temperature                    OK
  DC Input:                      OK
  DC Output:                     OK
  Load                           Less than 20 percent
  Voltage:
    48.0 V input                 54537 mV
    48.0 V fan supply            42910 mV
    3.3 V                         3506 mV
```

show chassis environment pem (M160 Router)

```
user@host> show chassis environment pem
PEM 0 status:
  State                         Online
  Temperature                   OK
  DC input                      OK
  DC output                     OK
  Load                          Less than 20 percent
  Voltage:
    48.0 V input           54833 mV
    48.0 V fan supply      50549 mV
    8.0 V bias             8239 mV
    5.0 V bias             5006 mV
```

show chassis environment pem (M320 Router)

```
user@host> show chassis environment pem
PEM 2 status:
  State                         Online
  Temperature                   OK
  DC input                      OK
  Load                          Less than 40 percent
    48.0 V input          51853 mV
    48.0 V fan supply     48877 mV
    8.0 V bias             8449 mV
    5.0 V bias             4998 mV
PEM 3 status:
  State                         Online
  Temperature                   OK
  DC input                      OK
  Load                          Less than 40 percent
    48.0 V input          51717 mV
    48.0 V fan supply     49076 mV
    8.0 V bias             8442 mV
    5.0 V bias             4998 mV
```

show chassis environment pem (MX104 Router)

```
user@host> show chassis environment pem
PEM 0 status:
  State                    Online
  Temperature              OK
  DC Output:               OK
  Voltage:
    12.0 V output          12281 mV
    3.3 V output            3353 mV
PEM 1 status:
  State                    Empty
```

show chassis environment pem (MX240 Router)

```
user@host> show chassis environment pem
PEM 0 status:
  State                    Online
  Temperature               OK
  DC Output            Voltage(V) Current(A)  Power(W)  Load(%)
                           51         4           204       12
PEM 1 status:
  State                    Online
  Temperature               OK
```



```
  DC Output            Voltage(V) Current(A)  Power(W)  Load(%)
                           51         4          204       12
```

show chassis environment pem (MX480 Router)

```
user@host> show chassis environment pem
PEM 0 status:
  State                          Online
  Temperature                     OK
  DC Input:                       OK
  DC Output            Voltage(V) Current(A)  Power(W)  Load(%)
                           51         4          204       12
PEM 1 status:
  State                          Online
  Temperature                     OK
  DC Input:                       OK
  DC Output            Voltage(V) Current(A)  Power(W)  Load(%)
                           51         4          204       12
```

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            Voltage(V) Current(A)  Power(W)  Load(%)
                           51         4          204       12
```

show chassis environment pem (T320 Router)

```
user@host> show chassis environment pem
PEM 0 status:
  State                               Online
  Temperature                         OK
  DC input:                           OK
```

show chassis environment pem (T640 Router)

```
user@host> show chassis environment pem
PEM 0 status:
  State                               Online
  Temperature                      22 degrees C / 71 degrees F
  AC input: OK
  DC output:             Voltage   Current        Power     Load
       FPC 0               56875       606           34        4
       FPC 1               57016       525           29        3
       FPC 2                   0         0            0        0
       FPC 3                   0         0            0        0
       FPC 4                   0         0            0        0
       FPC 5                   0         0            0        0
       FPC 6               57158      1581           90       12
       FPC 7                   0         0            0        0
  SCG/CB/SIB               56750      1125           63        5
```

show chassis environment pem (T4000 Router)

```
user@host> show chassis environment pem
PEM 0 status:
  State                          Online
  Temperature                    33 degrees C / 91 degrees F
```



```
    DC Input:                OK
                         Voltage(V)  Current(A)  Power(W)  Load(%)
        INPUT 0            54.625      9.812       535       22
        INPUT 1            54.625     10.250       559       23
        INPUT 2            55.125      0.125         6        0
        INPUT 3            54.500     10.062       548       22
        INPUT 4            54.750      9.375       513       21
        INPUT 5            54.750     10.187       557       23
    DC Output            Voltage(V)  Current(A)  Power(W)  Load(%)
        FPC 0              55.750     10.125       564       37
        FPC 1              51.625      0.000         0        0
        FPC 2              52.000      0.000         0        0
        FPC 3              55.062     10.437       574       38
        FPC 4              52.125      0.000         0        0
        FPC 5              55.000      9.375       515       34
        FPC 6              55.187      9.687       534       35
        FPC 7              51.437      0.000         0        0
        SCG/CB/SIB         55.375     15.750       872       35
        FAN                54.562     14.750       804       42
```

show chassis environment pem (T640/T1600/T4000 Routers With Six-Input DC Power Supply)

```
user@host> show chassis environment pem
PEM 1 status:
  State                      Online
  Temperature                36 degrees C / 96 degrees F
  DC Input:                  OK
                         Voltage(V)  Current(A)  Power(W)  Load(%)
        INPUT 0             0.000      0.000         0        0
        INPUT 1            54.875      3.812       209       27
        INPUT 2            55.375      3.937       218       29
        INPUT 3            54.625      3.750       204       27
        INPUT 4            55.125      3.375       186       24
        INPUT 5            55.125      3.375       186       24
  DC Output              Voltage(V)  Current(A)  Power(W)  Load(%)
        FPC 0              52.312      0.000         0        0
        FPC 1              52.687      0.000         0        0
        FPC 2              52.812      0.000         0        0
        FPC 3              55.812      7.062       394       52
        FPC 4              52.625      0.000         0        0
        FPC 5              52.625      0.000         0        0
        FPC 6              52.750      0.000         0        0
        FPC 7              52.750      0.000         0        0
        SCG/CB/SIB         55.937     11.937       667       55
        FAN                55.812      4.937       275       36
```

show chassis environment pem lcc (TX Matrix Routing Matrix)

```
user@host> show chassis environment pem 0 lcc 0
lcc0-re0:
--------------------------------------------------------------------------
PEM 0 status:
  State                           Present
  Temperature                  27 degrees C / 80 degrees F
  DC input:                       Check
  DC output:               Voltage   Current       Power    Load
         FPC 0                   0         0           0       0
         FPC 1                   0         0           0       0
         FPC 2                   0         0           0       0
         FPC 3                   0         0           0       0
         FPC 4                   0         0           0       0
```



```
         FPC 5                 0         0           0        0
         FPC 6                 0         0           0        0
         FPC 7                 0         0           0        0
    SCG/CB/SIB                 0         0           0        0
```

show chassis environment pem scc (TX Matrix Routing Matrix)

```
user@host> show chassis environment pem scc
scc-re0:
--------------------------------------------------------------------------
PEM 1 status:
  State                            Online
  Temperature                   24 degrees C / 75 degrees F
  DC input:                        OK
  DC output:            Voltage    Current        Power     Load
         SIB 0                 0         0            0        0
         SIB 1                 0         0            0        0
         SIB 2                 0         0            0        0
         SIB 3             56550         0            0        0
         SIB 4             55958      6912          386       51
```

show chassis environment pem sfc (TX Matrix Plus Routing Matrix)

```
user@host> show chassis environment pem sfc 0
sfc0-re0:
--------------------------------------------------------------------------
PEM 0 status:
  State                       Online
  Temperature                 35 degrees C / 95 degrees F
  DC Input:                     OK
  DC Output             Voltage    Current        Power     Load
        Channel 0          53820     14140          761       59
        Channel 1          53550     12720          681       53
        Channel 2          53840     12930          696       54
        Channel 3          53690     14990          804       63
        Channel 4          53620     15070          808       63
        Channel 5          53900     14820          798       62
        Channel 6          54120     5020           271       21
```

show chassis environment pem lcc (TX Matrix Plus Routing Matrix)

```
user@host> show chassis environment lcc 0

lcc0-re1:
--------------------------------------------------------------------------
PEM 0 status:
  State                       Online
  Temperature                 38 degrees C / 100 degrees F
  DC Input:                   OK
  DC Output             Voltage    Current        Power     Load
        FPC 0              0          0             0         0
        FPC 1              0          0             0         0
        FPC 2              0          0             0         0
        FPC 3              0          0             0         0
        FPC 4              56408      7575          427       56
        FPC 5              0          0             0         0
        FPC 6              56266      7956          447       59
        FPC 7              56283      6100          343       45
        SCG/CB/SIB         55916      8950          500       41
PEM 1 status:
  State                       Present
  Temperature                 35 degrees C / 95 degrees F
```

```
  DC Input:                Check
  DC Output            Voltage   Current        Power     Load
      FPC 0              0         0              0         0
      FPC 1              0         0              0         0
      FPC 2              0         0              0         0
      FPC 3              0         0              0         0
      FPC 4              0         0              0         0
      FPC 5              0         0              0         0
      FPC 6              0         0              0         0
      FPC 7              0         0              0         0
      SCG/CB/SIB         0         0              0         0
```

show chassis environment pem node-device (QFabric System)

```
user@switch> show chassis environment pem node-device node1
FPC 0 PEM 0 status:
  State                      Check
  Airflow                    Front to Back
  Temperature                OK
  AC Input:                  OK
  DC Output            Voltage(V) Current(A)  Power(W)  Load(%)
                           12         10          120       18
FPC 0 PEM 1 status:
  State                      Online
  Airflow                    Back to Front
  Temperature                OK
  AC Input:                  OK
  DC Output            Voltage(V) Current(A)  Power(W)  Load(%)
                           11         10          110      17
```

show chassis environment pem (QFX Series and OCX Series)

```
user@switch> show chassis environment pem
FPC 0 PEM 1 status:
  State                      Online
  Airflow                    Front to Back
  Temperature                OK
  AC Input:                  OK
  DC Output            Voltage(V) Current(A)  Power(W)  Load(%)
                           12         17          204       31
```

show chassis environment pem interconnect-device (QFabric System)

```
user@switch> show chassis environment pem interconnect-device IC11
IC1 PEM 1 status:
  State                      Online
  Airflow                    Front to Back
  Temperature                OK
  AC Input:                  OK
  DC Output            Voltage(V) Current(A)  Power(W)  Load(%)
                           12         18          216       33
```

show chassis environment psu

Syntax

show chassis environment psu
<slot-number>

Release Information

Command introduced in Junos OS Release 10.3 for EX Series switches.

Description

(On EX8200 switches only) Display the state of the power supply.

Options

none—Display the state of the power supply for all power supplies.

slot-number—(Optional) Display the state of the power supply for a specific power supply slot number (0–5).

Required Privilege Level

view

Related Documentation

- *Verifying Power Configuration and Use*
- *show chassis power-budget-statistics*

List of Sample Output

show chassis environment psu on page 889
show chassis environment psu (for PSU 1) on page 890

Output Fields

Table 58 on page 889 lists the output fields for the **show chassis environment psu** command. Output fields are listed in the approximate order in which they appear.

Table 58: show chassis environment psu Output Fields

Field Name	Field Description
State	State of the power supply: Online, Offline, or Empty.
Temperature	Temperature for the online power supply: OK or Out of Range.
DC Output	DC output for the online power supply: OK or Out of Range.

Sample Output

show chassis environment psu

```
user@switch> show chassis environment psu

PSU 0 status:
  State                        Offline
PSU 1 status:
  State                        Online
  Temperature                   OK
  DC Output:                    OK
PSU 2 status:
  State                        Online
  Temperature                   OK
  DC Output:                    OK
```

```
PSU 3 status:
  State                        Offline
PSU 4 status:
  State                        Offline
PSU 5 status:
  State                        Offline
```

show chassis environment psu (for PSU 1)

```
user@switch> show chassis environment psu 1
PSU 1 status:
  State                        Online
  Temperature                   OK
  DC Output:                    OK
```

show chassis environment psm

Syntax show chassis environment psm
<*psm-slot-number*>

Release Information Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description Display chassis environmental information about the power supply module (PSM).

Options **none**—Display environmental information about all PSMs.

psm-slot-number—(Optional) Display environmental information about the specified power supply module. For MX2020 routers, replace ***psm-slot-number*** with a value from 0 through 17. For MX2010 routers, replace ***psm-slot-number*** with a value from 0 through 8.

Required Privilege Level view

Related Documentation

- show chassis environment on page 719

List of Sample Output show chassis environment psm (MX2020 Router) on page 892
show chassis environment psm (MX2010 Router) on page 894

Output Fields Table 59 on page 891 lists the output fields for the **show chassis environment psm** command. Output fields are listed in the approximate order in which they appear.

Table 59: show chassis environment psm Output Fields

Field Name	Field Description
State	Status of the PSM. • **Online**—The PSM is online and running. • **Offline**—PSM is powered down.
Temperature	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the PSM.
DC Input	State of the DC input power feed for the specified zone at the specified amps and voltage, and load for the PSM.
DC Output	DC power output in Watts for the specified zone at the specified amps and voltage (A @ V), and load and percentage utilization of the maximum capacity for the PSM.
Hours Used	Number of hours the PSM has been operational.

Sample Output

show chassis environment psm (MX2020 Router)

```
user@host> show chassis environment psm
PSM 2 status:
  State                     Online
  Temperature               OK
  DC Input                  Feed       Voltage(V)  Current(A) Power(W)
                            INP0        50.00       18.90      945.00
                            INP1        0.00        0.00       0.00
  DC Output                 Voltage(V) Current(A)  Power(W)   Load(%)
                              51.75     16.50       853.88     40.66
  Hours Used                6140
PSM 3 status:
  State                     Online
  Temperature               OK
  DC Input                  Feed       Voltage(V)  Current(A) Power(W)
                            INP0        50.40       18.90      952.56
                            INP1        0.00        0.00       0.00
  DC Output                 Voltage(V) Current(A)  Power(W)   Load(%)
                              51.75     16.50       853.88     40.66
  Hours Used                6140
PSM 4 status:
  State                     Online
  Temperature               OK
  DC Input                  Feed       Voltage(V)  Current(A) Power(W)
                            INP0        50.40       18.90      952.56
                            INP1        0.00        0.00       0.00
  DC Output                 Voltage(V) Current(A)  Power(W)   Load(%)
                              52.00     16.75       871.00     41.48
  Hours Used                6140
PSM 5 status:
  State                     Online
  Temperature               OK
  DC Input                  Feed       Voltage(V)  Current(A) Power(W)
                            INP0        50.40       18.90      952.56
                            INP1        0.00        0.00       0.00
  DC Output                 Voltage(V) Current(A)  Power(W)   Load(%)
                              52.00     16.50       858.00     40.86
  Hours Used                6140
PSM 6 status:
  State                     Online
  Temperature               OK
  DC Input                  Feed       Voltage(V)  Current(A) Power(W)
                            INP0        50.40       18.90      952.56
                            INP1        0.00        0.00       0.00
  DC Output                 Voltage(V) Current(A)  Power(W)   Load(%)
                              52.00     16.75       871.00     41.48
  Hours Used                6140
PSM 7 status:
  State                     Online
  Temperature               OK
  DC Input                  Feed       Voltage(V)  Current(A) Power(W)
                            INP0        50.40       19.20      967.68
                            INP1        0.00        0.00       0.00
  DC Output                 Voltage(V) Current(A)  Power(W)   Load(%)
                              52.00     16.75       871.00     41.48
  Hours Used                6140
PSM 8 status:
  State                     Online
```

```
  Temperature                OK
  DC Input                   Feed        Voltage(V)  Current(A) Power(W)
                             INP0          50.00       20.40     1020.00
                             INP1        0.00          0.00      0.00
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               51.75      17.00       879.75     41.89
  Hours Used                 3380
PSM 11 status:
  State                      Online
  Temperature                OK
  DC Input                   Feed        Voltage(V)  Current(A) Power(W)
                             INP0          0.00        0.00      0.00
                             INP1          50.40       18.30     922.32
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               52.00      16.25       845.00     40.24
  Hours Used                 5615
PSM 12 status:
  State                      Online
  Temperature                OK
  DC Input                   Feed        Voltage(V)  Current(A) Power(W)
                             INP0          0.00        0.00      0.00
                             INP1          50.40       18.30     922.32
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               52.00      16.00       832.00     39.62
  Hours Used                 6143
PSM 13 status:
  State                      Online
  Temperature                OK
  DC Input                   Feed        Voltage(V)  Current(A) Power(W)
                             INP0          0.00        0.00      0.00
                             INP1          50.40       18.00     907.20
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               52.00      16.00       832.00     39.62
  Hours Used                 6143
PSM 14 status:
  State                      Online
  Temperature                OK
  DC Input                   Feed        Voltage(V)  Current(A) Power(W)
                             INP0          0.00        0.00      0.00
                             INP1          50.00       18.30     915.00
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               52.00      16.00       832.00     39.62
  Hours Used                 6143
PSM 15 status:
  State                      Online
  Temperature                OK
  DC Input                   Feed        Voltage(V)  Current(A) Power(W)
                             INP0          0.00        0.00      0.00
                             INP1          48.80       18.90     922.32
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               52.00      16.25       845.00     40.24
  Hours Used                 6143
PSM 16 status:
  State                      Online
  Temperature                OK
  DC Input                   Feed        Voltage(V)  Current(A) Power(W)
                             INP0          0.00        0.00      0.00
                             INP1          48.80       18.90     922.32
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               52.00      16.25       845.00     40.24
  Hours Used                 6143
```

```
PSM 17 status:
  State                        Online
  Temperature                  OK
  DC Input                     Feed        Voltage(V)  Current(A) Power(W)
                               INP0          0.00        0.00       0.00
                               INP1         48.80       18.90     922.32
  DC Output                    Voltage(V) Current(A)  Power(W)   Load(%)
                                 52.00      16.25      845.00     40.24
  Hours Used                   5207
```

show chassis environment psm (MX2010 Router)

```
user@host> show chassis environment psm
PSM 0 status:
  State                        Online
  Temperature                  OK
  DC Input                     Feed        Voltage(V)  Current(A) Power(W)
                               INP0         51.20       14.70     752.64
                               INP1          0.00        0.00       0.00
  DC Output                    Voltage(V) Current(A)  Power(W)   Load(%)
                                 51.25      13.00      666.25     26.65
  Hours Used                   2056
PSM 1 status:
  State                        Online
  Temperature                  OK
  DC Input                     Feed        Voltage(V)  Current(A) Power(W)
                               INP0         51.20       14.35     734.72
                               INP1          0.00        0.00       0.00
  DC Output                    Voltage(V) Current(A)  Power(W)   Load(%)
                                 51.25      12.75      653.44     26.14
  Hours Used                   2008
PSM 2 status:
  State                        Online
  Temperature                  OK
  DC Input                     Feed        Voltage(V)  Current(A) Power(W)
                               INP0         51.20       14.35     734.72
                               INP1          0.00        0.00       0.00
  DC Output                    Voltage(V) Current(A)  Power(W)   Load(%)
                                 51.50      13.00      669.50     26.78
  Hours Used                   2032
PSM 3 status:
  State                        Online
  Temperature                  OK
  DC Input                     Feed        Voltage(V)  Current(A) Power(W)
                               INP0         50.40       14.35     723.24
                               INP1          0.00        0.00       0.00
  DC Output                    Voltage(V) Current(A)  Power(W)   Load(%)
                                 51.00      12.75      650.25     26.01
  Hours Used                   2008
PSM 4 status:
  State                        Online
  Temperature                  OK
  DC Input                     Feed        Voltage(V)  Current(A) Power(W)
                               INP0         51.20       14.00     716.80
                               INP1          0.00        0.00       0.00
  DC Output                    Voltage(V) Current(A)  Power(W)   Load(%)
                                 51.25      13.00      666.25     26.65
  Hours Used                   2055
PSM 5 status:
  State                        Online
  Temperature                  OK
```

```
  DC Input                   Feed      Voltage(V)  Current(A) Power(W)
                             INP0        51.20       14.70     752.64
                             INP1        0.00        0.00      0.00
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               51.25      13.00      666.25     26.65
  Hours Used                 2056
PSM 6 status:
  State                      Online
Temperature                OK
  DC Input                   Feed      Voltage(V)  Current(A) Power(W)
                             INP0        50.80       14.70     746.76
                             INP1        0.00        0.00      0.00
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               51.25      13.00      666.25     26.65
  Hours Used                 2056
PSM 7 status:
  State                      Online
  Temperature                OK
  DC Input                   Feed      Voltage(V)  Current(A) Power(W)
                             INP0        50.40       14.70     740.88
                             INP1        0.00        0.00      0.00
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               51.25      13.00      666.25     26.65
  Hours Used                 2056
PSM 8 status:
  State                      Online
  Temperature                OK
  DC Input                   Feed      Voltage(V)  Current(A) Power(W)
                             INP0        50.40       14.70     740.88
                             INP1        0.00        0.00      0.00
  DC Output                  Voltage(V) Current(A)  Power(W)   Load(%)
                               51.25      13.00      666.25     26.65
  Hours Used                 2056
```

show chassis environment routing-engine

List of Syntax

Syntax

```
show chassis environment routing-engine
<slot>
```

Syntax (TX Matrix Routers)

```
show chassis environment routing-engine
<lcc number | scc>
<slot>
```

Syntax (TX Matrix Plus Routers)

```
show chassis environment routing-engine
<lcc number | sfc number>
<slot>
```

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

```
show chassis environment routing-engine
<slot>
```

Syntax (MX Series Routers)

```
show chassis environment routing-engine
<slot>
<all-members>
<local>
<member member-id>
```

Syntax (QFX Series)

```
show chassis environment routing-engine
interconnect-device name
```

Syntax (OCX Series)

```
show chassis environment routing-engine
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.1 for the T4000 Core Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display Routing Engine environmental status information.

Options

none—Display environmental information about all Routing Engines. For a TX Matrix router, display environmental information about all Routing Engines on the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display environmental information about all Routing Engines on the TX Matrix Plus router and its attached routers.

all-members—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in all member routers in the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display environmental information about the Routing Engines for the Interconnect device.

lcc *number*——(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in the specified member in the Virtual Chassis configuration. Replace ***member-id*** with the value of 0 or 1.

scc—(TX Matrix router only) (Optional) Display environmental information about the Routing Engine in the TX Matrix router (switch-card chassis).

sfc—(TX Matrix Plus router only) (Optional) Display environmental information about the Routing Engine in the TX Matrix Plus router (or switch-fabric chassis).

slot—(Optional) Display environmental information about an individual Routing Engine. On M10i, M20, M40e, M120, M160, M320, MX Series, MX104 routers, MX2010 routers, MX2020 routers, and T Series routers, replace ***slot*** with **0** or **1**. On M5, M7i, M10, and M40 routers and on the J Series router, replace ***slot*** with **0**. On EX3200 and EX4200 standalone switches, replace ***slot*** with **0**. On EX4200 switches in a Virtual Chassis configuration and on EX8208 and EX8216 switches, replace ***slot*** with **0** or **1**. On the QFX3500 switch, there is only one Routing Engine, so you do not need to specify the slot number. On PTX Series Packet Transport Routers, replace ***slot*** with **0** or **1**

Required Privilege Level

view

Related Documentation

- request chassis routing-engine master on page 649
- show chassis routing-engine on page 1490

List of Sample Output

Output Fields

Table 60 on page 898 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 60: show chassis environment routing-engine Output Fields

Field Name	Field Description
Routing engine *slot* status	Number of the Routing Engine slot: **0** or **1**.
State	Status of the Routing Engine: • **Online Master**—Routing Engine is online, operating as Master. • **Online Standby**—Routing Engine is online, operating as Standby. • **Offline**—Routing Engine is offline.
Temperature	Temperature of the air flowing past the Routing Engine.
CPU Temperature	(PTX Series and T4000 Core Routers only) Temperature of the air flowing past the Routing Engine CPU.

Sample Output

show chassis environment routing-engine (Nonredundant)

```
user@host> show chassis environment routing-engine
Routing Engine 0 status:
  State                            Online Master
  Temperature                   27 degrees C / 80 degrees
```

show chassis environment routing-engine (Redundant)

```
user@host> show chassis environment routing-engine
Route Engine 0 status:
  State:                       Online Master
  Temperature:               26 degrees C / 78 degrees F
Route Engine 1 status:
```



```
  State:                        Online Standby
  Temperature:                26 degrees C / 78 degrees F
```

show chassis environment routing-engine (MX104 Router)

```
user@ host >show chassis environment routing-engine
Routing Engine 0 status:
  State                        Online Master
  Temperature                  34 degrees C / 93 degrees F
  CPU Temperature              43 degrees C / 109 degrees F
Routing Engine 1 status:
  State                        Online Standby
  Temperature                  33 degrees C / 91 degrees F
  CPU Temperature              39 degrees C / 102 degrees F
```

show chassis environment routing-engine (MX2010 Router)

```
user@host> show chassis environment routing-engine
Routing Engine 0 status:
  State                        Online Master
  Temperature                  37 degrees C / 98 degrees F
  CPU Temperature              37 degrees C / 98 degrees F
Routing Engine 1 status:
  State                        Online Standby
  Temperature                  35 degrees C / 95 degrees F
  CPU Temperature              34 degrees C / 93 degrees F
```

show chassis environment routing-engine (MX2020 Router)

```
user@host> show chassis environment routing-engine
Routing Engine 0 status:
  State                        Online Master
  Temperature                  35 degrees C / 95 degrees F
  CPU Temperature              34 degrees C / 93 degrees F
Routing Engine 1 status:
  State                        Online Standby
  Temperature                  44 degrees C / 111 degrees F
  CPU Temperature              43 degrees C / 109 degrees F
```

show chassis environment routing-engine (TX Matrix Plus Router)

```
user@host> show chassis environment routing-engine
sfc0-re0:
--------------------------------------------------------------------------
Routing Engine 0 status:
  State                        Online Master
  Temperature                  26 degrees C / 78 degrees F
Routing Engine 1 status:
  State                        Online Standby
  Temperature                  28 degrees C / 82 degrees F

lcc0-re0:
--------------------------------------------------------------------------
Routing Engine 0 status:
  State                        Online Master
  Temperature                  30 degrees C / 86 degrees F
Routing Engine 1 status:
  State                        Online Standby
  Temperature                  29 degrees C / 84 degrees F
```


show chassis environment routing-engine (T4000 Core Router)

```
user@host> show chassis environment routing-engine
Routing Engine 0 status:
  State                        Online Master
  Temperature                  33 degrees C / 91 degrees F
  CPU Temperature              50 degrees C / 122 degrees F
Routing Engine 1 status:
  State                        Online Standby
  Temperature                  33 degrees C / 91 degrees F
  CPU Temperature              46 degrees C / 114 degrees F
```

show chassis environment routing-engine (QFX Series and OCX Series)

```
user@switch> show chassis environment routing-engine
Routing Engine 0 status:
  State                        Online Master
  Temperature                  42 degrees C / 107 degrees F
```

show chassis environment routing-engine interconnect-device (QFabric System)

```
user@switch> show chassis environment routing-engine interconnect-device interconnect1
routing-engine interconnect-device interconnect1
Routing Engine 0 status:
  State                        Online Standby
  Temperature                  52 degrees C / 125 degrees F
Routing Engine 1 status:
  State                        Online Master
  Temperature                  57 degrees C / 134 degrees F
```

show chassis environment routing-engine (PTX5000 Packet Transport Router)

```
user@switch> show chassis environment routing-engine
Routing Engine 0 status:
  State                        Online Master
  Temperature                  55 degrees C / 131 degrees F
  CPU Temperature              66 degrees C / 150 degrees F
Routing Engine 1 status:
  State                        Online Standby
  Temperature                  52 degrees C / 125 degrees F
  CPU Temperature              64 degrees C / 147 degrees F
```

show chassis environment scg

List of Syntax

Syntax on page 901
Syntax (TX Matrix and TX Matrix Plus Router) on page 901

Syntax

show chassis environment scg
<*slot*>

Syntax (TX Matrix and TX Matrix Plus Router)

show chassis environment scg
<lcc *number*>
<*slot*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 12.1 for the T4000 Core Routers.

Description

Display SONET Clock Generator (SCG) environmental information.

Options

none—(TX Matrix and TX Matrix Plus routers only) Display environmental information about all SCGs. On a TX Matrix router, display environmental information about all SCGs on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about all SCGs on the TX Matrix Plus router and its attached routers.

lcc *number*—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

slot—(Optional) Display environmental information about the SCG. Replace ***slot*** with **0** or **1**.

Required Privilege Level

view

Related Documentation

- request chassis scg on page 654
- *Configuring the Clock Source*
- *T320 SONET Clock Generator (SCG) Description*

List of Sample Output

show chassis environment scg (T Series Routers) on page 902

show chassis environment scg (T4000 Core Routers) on page 903
show chassis environment scg lcc (TX Matrix Router) on page 903
show chassis environment scg lcc (TX Matrix Plus Router) on page 903
show chassis environment scg (TX Matrix Plus Router) on page 904

Output Fields

Table 61 on page 902 lists the output fields for the **show chassis environment scg** command. Output fields are listed in the approximate order in which they appear.

Table 61: show chassis environment scg Output Fields

Field Name	Field Description
SCG *slot* status	Number of the SCG slot: **0** or **1**.
State	Status of the SCG: • **Online**—SCG is online and running. • **Offline**—SCG is powered down. If two SCGs are installed and online, one is functioning as the master, and the other is the standby.
Temperature	Temperature of the air flowing past the SCG.
Power	Power on the SCG. The left column displays required power, in volts. The right column displays measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.

Sample Output

show chassis environment scg (T Series Routers)

```
user@host> show chassis environment scg
SCG 0 status:
  State                          Online -  Master clock
  Temperature                 29 degrees C / 84 degrees F
  Power:
    GROUND                       0 mV
    3.3 V                     3297 mV
    5.0 V                     5050 mV
    5.6 V                     5682 mV
    1.8 V bias                1787 mV
    3.3 V bias                3277 mV
    5.0 V bias                4984 mV
    8.0 V bias                8400 mV
  BUS Revision                  40
SCG 1 status:
  State                          Online - Standby
  Temperature                 28 degrees C / 82 degrees F
  Power:
    GROUND                       0 mV
    3.3 V                     3317 mV
    5.0 V                     5057 mV
    5.6 V                     5689 mV
    1.8 V bias                1794 mV
    3.3 V bias                3296 mV
```



```
    5.0 V bias                4991 mV
    8.0 V bias                8410 mV
    BUS Revision                40
```

show chassis environment scg (T4000 Core Routers)

```
user@host> show chassis environment scg
SCG 0 status:
  State                        Online -  Master clock
  Temperature                  33 degrees C / 91 degrees F
  Power
    GROUND                         0 mV
    1.8 V bias                  1794 mV
    3.3 V                       3310 mV
    3.3 V bias                  3299 mV
    5.0 V                       5040 mV
    5.0 V bias                  5003 mV
    5.6 V                       5780 mV
    8.0 V bias                  7416 mV
  Bus Revision                 40
SCG 1 status:
  State                        Online - Standby
  Temperature                  33 degrees C / 91 degrees F
  Power
    GROUND                         0 mV
    1.8 V bias                  1794 mV
    3.3 V                       3319 mV
    3.3 V bias                  3286 mV
    5.0 V                       5047 mV
    5.0 V bias                  5013 mV
    5.6 V                       5758 mV
    8.0 V bias                  7347 mV
  Bus Revision                 40
```

show chassis environment scg lcc (TX Matrix Router)

```
user@host> show chassis environment scg lcc 0 0
lcc0-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                             Online -  Master clock
  Temperature                    30 degrees C / 86 degrees F
  Power:
    GROUND                        0 mV
    3.3 V                      3321 mV
    5.0 V                      5062 mV
    5.6 V                      5682 mV
    1.8 V bias                 1789 mV
    3.3 V bias                 3289 mV
    5.0 V bias                 4993 mV
    8.0 V bias                 7807 mV
  BUS Revision                   40
```

show chassis environment scg lcc (TX Matrix Plus Router)

```
user@host> show chassis environment scg lcc 0
lcc0-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                        Online -  Master clock
  Temperature                  42 degrees C / 107 degrees F
  Power
```



```
    GROUND                     0 mV
    1.8 V bias              1800 mV
    3.3 V                   3290 mV
    3.3 V bias              3304 mV
    5.0 V                   5042 mV
    5.0 V bias              4979 mV
    5.6 V                   5765 mV
    8.0 V bias              7682 mV
  Bus Revision             40
```

show chassis environment scg (TX Matrix Plus Router)

```
user@host> show chassis environment scg
lcc0-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                      Online -  Master clock
  Temperature                40 degrees C / 104 degrees F
  Power
    GROUND                     0 mV
    1.8 V bias              1800 mV
    3.3 V                   3291 mV
    3.3 V bias              3304 mV
    5.0 V                   5042 mV
    5.0 V bias              4979 mV
    5.6 V                   5765 mV
    8.0 V bias              7643 mV
  Bus Revision             40

lcc1-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                      Online -  Master clock
  Temperature                37 degrees C / 98 degrees F
  Power
    GROUND                     0 mV
    1.8 V bias              1788 mV
    3.3 V                   3305 mV
    3.3 V bias              3284 mV
    5.0 V                   5042 mV
    5.0 V bias              5010 mV
    5.6 V                   5748 mV
    8.0 V bias              7692 mV
  Bus Revision             40

lcc2-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                      Online -  Master clock
  Temperature                39 degrees C / 102 degrees F
  Power
    GROUND                     0 mV
    1.8 V bias              1785 mV
    3.3 V                   3306 mV
    3.3 V bias              3301 mV
    5.0 V                   5045 mV
    5.0 V bias              4993 mV
    5.6 V                   5765 mV
    8.0 V bias              7838 mV
  Bus Revision             40
```

```
lcc3-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                       Online -  Master clock
  Temperature                 39 degrees C / 102 degrees F
  Power
    GROUND                       0 mV
    1.8 V bias                 1800 mV
    3.3 V                      3290 mV
    3.3 V bias                 3294 mV
    5.0 V                      5050 mV
    5.0 V bias                 4984 mV
    5.6 V                      5780 mV
    8.0 V bias                 7716 mV
  Bus Revision                40
```

show chassis environment sfb

Syntax

show chassis environment sfb
<*sfb-slot-number*>

Release Information

Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

Display chassis environmental information about the Switch Fabric Board (SFB).

Options

none—Display environmental information about all Switch Fabric Boards.

sfb-slot-number—(Optional) Display environmental information about the specified Switch Fabric Board. For MX2020 and MX2010 routers, replace ***sfb-slot-number*** with a value from 0 through 7.

Required Privilege Level

view

Related Documentation

- request chassis sfb on page 656
- show chassis sfb on page 1514

List of Sample Output

show chassis environment sfb (MX2020 Router) on page 907
show chassis environment sfb (MX2010 Router) on page 911

Output Fields

Table 62 on page 906 lists the output fields for the **show chassis environment sfb** command. Output fields are listed in the approximate order in which they appear.

Table 62: show chassis environment sfb Output Fields

Field Name	Field Description
State	Status of the SFB. • **Online**—The SFB is online and running. • **Offline**— SFB is powered down.
Temperature	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the SFB. • **Intake**—Measures the temperature of the air intake. • **Exhaust**—Measures the temperature of the hot air exhaust. • **SFB-XF2**—Measures the temperature of the hot air exhaust for the XF2 fabric plane. • **SFB-XF1**—Measures the temperature of the hot air exhaust for the XF1 fabric plane. • **SFB-XF0**—Measures the temperature of the hot air exhaust for the XF0 fabric plane.
Power	Power required and measured on the SFB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Sample Output

show chassis environment sfb (MX2020 Router)

```
user@host> show chassis environment sfb
SFB 0 status:
  State                       Online
  Intake-Zone0 Temperature    51 degrees C / 123 degrees F
  Exhaust-Zone1 Temperature   44 degrees C / 111 degrees F
  IntakeA-Zone0 Temperature   46 degrees C / 114 degrees F
  IntakeB-Zone1 Temperature   37 degrees C / 98 degrees F
  Exhaust-Zone0 Temperature   48 degrees C / 118 degrees F
  SFB-XF2-Zone1 Temperature   58 degrees C / 136 degrees F
  SFB-XF1-Zone0 Temperature   65 degrees C / 149 degrees F
  SFB-XF0-Zone0 Temperature   64 degrees C / 147 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL      1500 mV
    LTC3880-XF2-1.5v-CH0       1500 mV
    LTC3880-XF2-1.5v-CH1       1500 mV
    LTC3880-XF2-1.0v-RAIL      1029 mV
    LTC3880-XF2-1.0v-CH0       1029 mV
    LTC3880-XF2-1.0v-CH1       1032 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1501 mV
    LTC3880-XF1-1.0v-RAIL      1029 mV
    LTC3880-XF1-1.0v-CH0       1029 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1500 mV
    LTC3880-XF0-1.5v-CH0       1500 mV
    LTC3880-XF0-1.5v-CH1       1501 mV
    LTC3880-XF0-1.0v-RAIL      1029 mV
    LTC3880-XF0-1.0v-CH0       1029 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-3.3v-RAIL          3300 mV
    LTC3880-3.3v-CH0           3300 mV
    LTC3880-3.3v-CH1           3299 mV
SFB 1 status:
  State                       Online
  Intake-Zone0 Temperature    52 degrees C / 125 degrees F
  Exhaust-Zone1 Temperature   44 degrees C / 111 degrees F
  IntakeA-Zone0 Temperature   47 degrees C / 116 degrees F
  IntakeB-Zone1 Temperature   37 degrees C / 98 degrees F
  Exhaust-Zone0 Temperature   47 degrees C / 116 degrees F
  SFB-XF2-Zone1 Temperature   59 degrees C / 138 degrees F
  SFB-XF1-Zone0 Temperature   63 degrees C / 145 degrees F
  SFB-XF0-Zone0 Temperature   65 degrees C / 149 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL      1500 mV
    LTC3880-XF2-1.5v-CH0       1500 mV
    LTC3880-XF2-1.5v-CH1       1501 mV
    LTC3880-XF2-1.0v-RAIL      1030 mV
    LTC3880-XF2-1.0v-CH0       1030 mV
    LTC3880-XF2-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1500 mV
    LTC3880-XF1-1.0v-RAIL      1029 mV
    LTC3880-XF1-1.0v-CH0       1029 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1500 mV
```



```
      LTC3880-XF0-1.5v-CH0      1500 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF0-1.0v-RAIL     1030 mV
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-3.3v-RAIL         3300 mV
      LTC3880-3.3v-CH0          3300 mV
      LTC3880-3.3v-CH1          3299 mV
  SFB 2 status:
    State                      Online
    Intake-Zone0 Temperature   52 degrees C / 125 degrees F
    Exhaust-Zone1 Temperature  44 degrees C / 111 degrees F
    IntakeA-Zone0 Temperature  47 degrees C / 116 degrees F
    IntakeB-Zone1 Temperature  37 degrees C / 98 degrees F
    Exhaust-Zone0 Temperature  49 degrees C / 120 degrees F
    SFB-XF2-Zone1 Temperature  62 degrees C / 143 degrees F
    SFB-XF1-Zone0 Temperature  66 degrees C / 150 degrees F
    SFB-XF0-Zone0 Temperature  66 degrees C / 150 degrees F
    Power
      LTC3880-XF2-1.5v-RAIL     1499 mV
      LTC3880-XF2-1.5v-CH0      1499 mV
      LTC3880-XF2-1.5v-CH1      1500 mV
      LTC3880-XF2-1.0v-RAIL     1030 mV
      LTC3880-XF2-1.0v-CH0      1030 mV
      LTC3880-XF2-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1500 mV
      LTC3880-XF1-1.5v-CH0      1500 mV
      LTC3880-XF1-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1030 mV
      LTC3880-XF1-1.0v-CH0      1030 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1499 mV
      LTC3880-XF0-1.5v-CH0      1499 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF0-1.0v-RAIL     1030 mV
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-3.3v-RAIL         3300 mV
      LTC3880-3.3v-CH0          3300 mV
      LTC3880-3.3v-CH1          3299 mV
  SFB 3 status:
    State                      Online
    Intake-Zone0 Temperature   53 degrees C / 127 degrees F
    Exhaust-Zone1 Temperature  44 degrees C / 111 degrees F
    IntakeA-Zone0 Temperature  48 degrees C / 118 degrees F
    IntakeB-Zone1 Temperature  38 degrees C / 100 degrees F
    Exhaust-Zone0 Temperature  49 degrees C / 120 degrees F
    SFB-XF2-Zone1 Temperature  62 degrees C / 143 degrees F
    SFB-XF1-Zone0 Temperature  65 degrees C / 149 degrees F
    SFB-XF0-Zone0 Temperature  68 degrees C / 154 degrees F
    Power
      LTC3880-XF2-1.5v-RAIL     1500 mV
      LTC3880-XF2-1.5v-CH0      1500 mV
      LTC3880-XF2-1.5v-CH1      1500 mV
      LTC3880-XF2-1.0v-RAIL     1029 mV
      LTC3880-XF2-1.0v-CH0      1029 mV
      LTC3880-XF2-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1500 mV
      LTC3880-XF1-1.5v-CH0      1500 mV
      LTC3880-XF1-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1030 mV
```



```
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1034 mV
    LTC3880-3.3v-RAIL         3300 mV
    LTC3880-3.3v-CH0          3300 mV
    LTC3880-3.3v-CH1          3300 mV
SFB 4 status:
  State                      Online
  Intake-Zone0 Temperature   54 degrees C / 129 degrees F
  Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
  IntakeA-Zone0 Temperature  49 degrees C / 120 degrees F
  IntakeB-Zone1 Temperature  39 degrees C / 102 degrees F
  Exhaust-Zone0 Temperature  50 degrees C / 122 degrees F
  SFB-XF2-Zone1 Temperature  61 degrees C / 141 degrees F
  SFB-XF1-Zone0 Temperature  64 degrees C / 147 degrees F
  SFB-XF0-Zone0 Temperature  67 degrees C / 152 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1030 mV
    LTC3880-XF2-1.0v-CH0      1030 mV
    LTC3880-XF2-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-3.3v-RAIL         3299 mV
    LTC3880-3.3v-CH0          3299 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 5 status:
  State                      Online
  Intake-Zone0 Temperature   54 degrees C / 129 degrees F
  Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
  IntakeA-Zone0 Temperature  49 degrees C / 120 degrees F
  IntakeB-Zone1 Temperature  40 degrees C / 104 degrees F
  Exhaust-Zone0 Temperature  50 degrees C / 122 degrees F
  SFB-XF2-Zone1 Temperature  63 degrees C / 145 degrees F
  SFB-XF1-Zone0 Temperature  65 degrees C / 149 degrees F
  SFB-XF0-Zone0 Temperature  70 degrees C / 158 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
```

```
      LTC3880-XF1-1.5v-CH0      1499 mV
      LTC3880-XF1-1.5v-CH1      1500 mV
      LTC3880-XF1-1.0v-RAIL     1030 mV
      LTC3880-XF1-1.0v-CH0      1030 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1499 mV
      LTC3880-XF0-1.5v-CH0      1499 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF0-1.0v-RAIL     1029 mV
      LTC3880-XF0-1.0v-CH0      1029 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-3.3v-RAIL         3299 mV
      LTC3880-3.3v-CH0          3299 mV
      LTC3880-3.3v-CH1          3300 mV
  SFB 6 status:
    State                      Online
    Intake-Zone0 Temperature   54 degrees C / 129 degrees F
    Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
    IntakeA-Zone0 Temperature  48 degrees C / 118 degrees F
    IntakeB-Zone1 Temperature  40 degrees C / 104 degrees F
    Exhaust-Zone0 Temperature  49 degrees C / 120 degrees F
    SFB-XF2-Zone1 Temperature  62 degrees C / 143 degrees F
    SFB-XF1-Zone0 Temperature  64 degrees C / 147 degrees F
    SFB-XF0-Zone0 Temperature  68 degrees C / 154 degrees F
    Power
      LTC3880-XF2-1.5v-RAIL     1499 mV
      LTC3880-XF2-1.5v-CH0      1499 mV
      LTC3880-XF2-1.5v-CH1      1501 mV
      LTC3880-XF2-1.0v-RAIL     1030 mV
      LTC3880-XF2-1.0v-CH0      1030 mV
      LTC3880-XF2-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1499 mV
      LTC3880-XF1-1.5v-CH0      1499 mV
      LTC3880-XF1-1.5v-CH1      1500 mV
      LTC3880-XF1-1.0v-RAIL     1029 mV
      LTC3880-XF1-1.0v-CH0      1029 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1499 mV
      LTC3880-XF0-1.5v-CH0      1499 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF0-1.0v-RAIL     1029 mV
      LTC3880-XF0-1.0v-CH0      1029 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-3.3v-RAIL         3300 mV
      LTC3880-3.3v-CH0          3300 mV
      LTC3880-3.3v-CH1          3300 mV
  SFB 7 status:
    State                      Online
    Intake-Zone0 Temperature   53 degrees C / 127 degrees F
    Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
    IntakeA-Zone0 Temperature  49 degrees C / 120 degrees F
    IntakeB-Zone1 Temperature  40 degrees C / 104 degrees F
    Exhaust-Zone0 Temperature  50 degrees C / 122 degrees F
    SFB-XF2-Zone1 Temperature  64 degrees C / 147 degrees F
    SFB-XF1-Zone0 Temperature  66 degrees C / 150 degrees F
    SFB-XF0-Zone0 Temperature  69 degrees C / 156 degrees F
    Power
      LTC3880-XF2-1.5v-RAIL     1500 mV
      LTC3880-XF2-1.5v-CH0      1500 mV
      LTC3880-XF2-1.5v-CH1      1501 mV
      LTC3880-XF2-1.0v-RAIL     1029 mV
```



```
    LTC3880-XF2-1.0v-CH0       1029 mV
    LTC3880-XF2-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1501 mV
    LTC3880-XF1-1.0v-RAIL      1030 mV
    LTC3880-XF1-1.0v-CH0       1030 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1499 mV
    LTC3880-XF0-1.5v-CH0       1499 mV
    LTC3880-XF0-1.5v-CH1       1501 mV
    LTC3880-XF0-1.0v-RAIL      1030 mV
    LTC3880-XF0-1.0v-CH0       1030 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-3.3v-RAIL          3300 mV
    LTC3880-3.3v-CH0           3300 mV
    LTC3880-3.3v-CH1           3300 mV
```

show chassis environment sfb (MX2010 Router)

```
user@host> show chassis environment sfb
SFB 0 status:
  State                       Online
  Intake-Zone0 Temperature    31 degrees C / 87 degrees F
  Exhaust-Zone1 Temperature   22 degrees C / 71 degrees F
  IntakeA-Zone0 Temperature   21 degrees C / 69 degrees F
  IntakeB-Zone1 Temperature   16 degrees C / 60 degrees F
  Exhaust-Zone0 Temperature   23 degrees C / 73 degrees F
  SFB-XF2-Zone1 Temperature   30 degrees C / 86 degrees F
  SFB-XF1-Zone0 Temperature   28 degrees C / 82 degrees F
  SFB-XF0-Zone0 Temperature   38 degrees C / 100 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL      1500 mV
    LTC3880-XF2-1.5v-CH0       1500 mV
    LTC3880-XF2-1.5v-CH1       1500 mV
    LTC3880-XF2-1.0v-RAIL       949 mV
    LTC3880-XF2-1.0v-CH0        949 mV
    LTC3880-XF2-1.0v-CH1        951 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1500 mV
    LTC3880-XF1-1.0v-RAIL       949 mV
    LTC3880-XF1-1.0v-CH0        949 mV
    LTC3880-XF1-1.0v-CH1        951 mV
    LTC3880-XF0-1.5v-RAIL      1499 mV
    LTC3880-XF0-1.5v-CH0       1499 mV
    LTC3880-XF0-1.5v-CH1       1500 mV
    LTC3880-XF0-1.0v-RAIL      1029 mV
    LTC3880-XF0-1.0v-CH0       1029 mV
    LTC3880-XF0-1.0v-CH1       1032 mV
    LTC3880-3.3v-RAIL          3300 mV
    LTC3880-3.3v-CH0           3300 mV
    LTC3880-3.3v-CH1           3299 mV
SFB 1 status:
  State                       Online
  Intake-Zone0 Temperature    32 degrees C / 89 degrees F
  Exhaust-Zone1 Temperature   20 degrees C / 68 degrees F
  IntakeA-Zone0 Temperature   25 degrees C / 77 degrees F
  IntakeB-Zone1 Temperature   15 degrees C / 59 degrees F
  Exhaust-Zone0 Temperature   24 degrees C / 75 degrees F
  SFB-XF2-Zone1 Temperature   31 degrees C / 87 degrees F
```

```
  SFB-XF1-Zone0 Temperature  31 degrees C / 87 degrees F
  SFB-XF0-Zone0 Temperature  37 degrees C / 98 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1499 mV
    LTC3880-XF2-1.5v-CH0      1499 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1031 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1031 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1032 mV
    LTC3880-3.3v-RAIL         3299 mV
    LTC3880-3.3v-CH0          3299 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 2 status:
  State                      Online
  Intake-Zone0 Temperature   26 degrees C / 78 degrees F
  Exhaust-Zone1 Temperature  19 degrees C / 66 degrees F
  IntakeA-Zone0 Temperature  23 degrees C / 73 degrees F
  IntakeB-Zone1 Temperature  15 degrees C / 59 degrees F
  Exhaust-Zone0 Temperature  21 degrees C / 69 degrees F
  SFB-XF2-Zone1 Temperature  29 degrees C / 84 degrees F
  SFB-XF1-Zone0 Temperature  26 degrees C / 78 degrees F
  SFB-XF0-Zone0 Temperature  31 degrees C / 87 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1031 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1031 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1032 mV
    LTC3880-3.3v-RAIL         3300 mV
    LTC3880-3.3v-CH0          3300 mV
    LTC3880-3.3v-CH1          3300 mV
SFB 3 status:
  State                      Offline
  Reason                         No power
SFB 4 status:
  State                      Online
```



```
  Intake-Zone0 Temperature   33 degrees C / 91 degrees F
  Exhaust-Zone1 Temperature  21 degrees C / 69 degrees F
  IntakeA-Zone0 Temperature  24 degrees C / 75 degrees F
  IntakeB-Zone1 Temperature  17 degrees C / 62 degrees F
  Exhaust-Zone0 Temperature  24 degrees C / 75 degrees F
  SFB-XF2-Zone1 Temperature  32 degrees C / 89 degrees F
  SFB-XF1-Zone0 Temperature  32 degrees C / 89 degrees F
  SFB-XF0-Zone0 Temperature  37 degrees C / 98 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1499 mV
    LTC3880-XF2-1.5v-CH0      1499 mV
 LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL      949 mV
    LTC3880-XF2-1.0v-CH0       949 mV
    LTC3880-XF2-1.0v-CH1       952 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1031 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL      949 mV
    LTC3880-XF0-1.0v-CH0       949 mV
    LTC3880-XF0-1.0v-CH1       952 mV
    LTC3880-3.3v-RAIL         3299 mV
    LTC3880-3.3v-CH0          3299 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 5 status:
  State                      Online
  Intake-Zone0 Temperature   27 degrees C / 80 degrees F
  Exhaust-Zone1 Temperature  20 degrees C / 68 degrees F
  IntakeA-Zone0 Temperature  23 degrees C / 73 degrees F
  IntakeB-Zone1 Temperature  15 degrees C / 59 degrees F
  Exhaust-Zone0 Temperature  22 degrees C / 71 degrees F
  SFB-XF2-Zone1 Temperature  27 degrees C / 80 degrees F
  SFB-XF1-Zone0 Temperature  34 degrees C / 93 degrees F
  SFB-XF0-Zone0 Temperature  32 degrees C / 89 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL      949 mV
    LTC3880-XF2-1.0v-CH0       949 mV
    LTC3880-XF2-1.0v-CH1       951 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL      949 mV
    LTC3880-XF1-1.0v-CH0       949 mV
    LTC3880-XF1-1.0v-CH1       951 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1032 mV
    LTC3880-3.3v-RAIL         3299 mV
    LTC3880-3.3v-CH0          3299 mV
```

```
    LTC3880-3.3v-CH1          3299 mV
SFB 6 status:
  State                      Online
  Intake-Zone0 Temperature   32 degrees C / 89 degrees F
  Exhaust-Zone1 Temperature  19 degrees C / 66 degrees F
  IntakeA-Zone0 Temperature  24 degrees C / 75 degrees F
 IntakeB-Zone1 Temperature  15 degrees C / 59 degrees F
  Exhaust-Zone0 Temperature  25 degrees C / 77 degrees F
  SFB-XF2-Zone1 Temperature  29 degrees C / 84 degrees F
  SFB-XF1-Zone0 Temperature  37 degrees C / 98 degrees F
  SFB-XF0-Zone0 Temperature  39 degrees C / 102 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1031 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL      949 mV
    LTC3880-XF1-1.0v-CH0       949 mV
    LTC3880-XF1-1.0v-CH1       951 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1032 mV
    LTC3880-3.3v-RAIL         3300 mV
    LTC3880-3.3v-CH0          3300 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 7 status:
  State                      Online
  Intake-Zone0 Temperature   31 degrees C / 87 degrees F
  Exhaust-Zone1 Temperature  18 degrees C / 64 degrees F
  IntakeA-Zone0 Temperature  20 degrees C / 68 degrees F
  IntakeB-Zone1 Temperature  13 degrees C / 55 degrees F
  Exhaust-Zone0 Temperature  22 degrees C / 71 degrees F
  SFB-XF2-Zone1 Temperature  27 degrees C / 80 degrees F
  SFB-XF1-Zone0 Temperature  26 degrees C / 78 degrees F
  SFB-XF0-Zone0 Temperature  39 degrees C / 102 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1499 mV
    LTC3880-XF2-1.5v-CH0      1499 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1031 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1031 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
```



```
LTC3880-XF0-1.0v-CH1      1031 mV
LTC3880-3.3v-RAIL         3300 mV
LTC3880-3.3v-CH0          3300 mV
LTC3880-3.3v-CH1          3299 mV
```

show chassis environment sfm

Syntax show chassis environment sfm
<*slot*>

Release Information Command introduced before Junos OS Release 7.4.

Description (M40e and M160 routers only) Display Switching and Forwarding Module (SFM) environmental information.

Options **none**—Display environmental information about all SFMs.

slot—(Optional) Display environmental information about an individual SFM. Replace ***slot*** with a value from **0** through **3**.

Required Privilege Level view

Related Documentation

- request chassis sfm on page 658
- request chassis sfm master switch on page 657
- *Configuring SFM Redundancy on M40e and M160 Routers*
- *Switching the Global Master and Backup Roles in a Virtual Chassis Configuration*

List of Sample Output show chassis environment sfm (M40e Router) on page 918
show chassis environment sfm (M160 Router) on page 918

Output Fields Table 63 on page 916 lists the output fields for the **show chassis environment sfm** command. Output fields are listed in the approximate order in which they appear.

Table 63: show chassis environment sfm Output Fields

Field Name	Field Description
SFM *slot* status	SFM slot number: **0** or **1** on an M40e router, or **0**, **1**, **2**, or **3** on an M160 router.
State	Status of the SFM: • **Online**—SFM is online and running. • **Offline**—SFM is powered down. If two SFMs are installed and online, one is functioning as the master, and the other is marked as the **Standby**.
SPP Temperature	Temperature of the air flowing past the Switch Plane Processor card.
SPR Temperature	Temperature of the air flowing past the Switch Plane Router card.
SPP Power	Information about the voltage supplied to the Switch Plane Processor card. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Table 63: show chassis environment sfm Output Fields *(continued)*

Field Name	Field Description
SPR Power	Information about the voltage supplied to the Switch Plane Router. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
CMB Revision	Revision level of the Chassis Management Bus (CMB) device.

Sample Output

show chassis environment sfm (M40e Router)

```
user@host> show chassis environment sfm
SFM 0 status:
  State                         Online
  SPP temperature            40 degrees C / 104 degrees F
  SPR temperature            44 degrees C / 111 degrees F
  SPP Power:
    1.5 V                  1501 mV
    2.5 V                  2472 mV
    3.3 V                  3293 mV
    5.0 V                  5028 mV
    5.0 V bias             4964 mV
  SPR Power:
    1.5 V                  1501 mV
    2.5 V                  2483 mV
    3.3 V                  3308 mV
    5.0 V                  5035 mV
    5.0 V bias             4981 mV
    8.0 V bias             8239 mV
  CMB Revision               12
SFM 1 status:
  State                         Online - Standby
  SPP temperature            43 degrees C / 109 degrees F
  SPR temperature            45 degrees C / 113 degrees F
  SPP Power:
    1.5 V                  1503 mV
    2.5 V                  2483 mV
    3.3 V                  3284 mV
    5.0 V                  5045 mV
    5.0 V bias             4993 mV
  SPR Power:
    1.5 V                  1498 mV
    2.5 V                  2472 mV
    3.3 V                  3284 mV
    5.0 V                  5035 mV
    5.0 V bias             4991 mV
    8.0 V bias             8231 mV
  CMB Revision               12
```

show chassis environment sfm (M160 Router)

```
user@host> show chassis environment sfm
SFM 0 status:
  State                         Online
  SPP temperature            43 degrees C / 109 degrees F
  SPR temperature            44 degrees C / 111 degrees F
  SPP Power:
    1.5 V                  1504 mV
    2.5 V                  2474 mV
    3.3 V                  3290 mV
    5.0 V                  5015 mV
    5.0 V bias             4962 mV
  SPR Power:
    1.5 V                  1498 mV
    2.5 V                  2482 mV
    3.3 V                  3299 mV
    5.0 V                  5020 mV
    5.0 V bias             4971 mV
```



```
    8.0 V bias              8229 mV
  CMB Revision                12
SFM 1 status:
  State                          Online
  SPP temperature             47 degrees C / 116 degrees F
  SPR temperature             50 degrees C / 122 degrees F
  SPP Power:
    1.5 V                   1499 mV
    2.5 V                   2466 mV
    3.3 V                   3274 mV
    5.0 V                   5025 mV
    5.0 V bias              4984 mV
  SPR Power:
    1.5 V                   1496 mV
    2.5 V                   2470 mV
    3.3 V                   3279 mV
    5.0 V                   5020 mV
    5.0 V bias              4993 mV
    8.0 V bias              8222 mV
  CMB Revision                12
SFM 2 status:
  State                          Online
  SPP temperature             50 degrees C / 122 degrees F
  SPR temperature             52 degrees C / 125 degrees F
  SPP Power:
    1.5 V                   1504 mV
    2.5 V                   2471 mV
    3.3 V                   3294 mV
    5.0 V                   5045 mV
    5.0 V bias              4981 mV
  SPR Power:
    1.5 V                   1496 mV
    2.5 V                   2470 mV
    3.3 V                   3293 mV
    5.0 V                   5028 mV
    5.0 V bias              4971 mV
    8.0 V bias              8214 mV
  CMB Revision                12
SFM 3 status:
  State                          Online
  SPP temperature             49 degrees C / 120 degrees F
  SPR temperature             48 degrees C / 118 degrees F
  SPP Power:
    1.5 V                   1505 mV
    2.5 V                   2484 mV
    3.3 V                   3296 mV
    5.0 V                   5040 mV
    5.0 V bias              4984 mV
  SPR Power:
    1.5 V                   1503 mV
    2.5 V                   2488 mV
    3.3 V                   3302 mV
    5.0 V                   5037 mV
    5.0 V bias              4993 mV
    8.0 V bias              8249 mV
  CMB Revision                12
```

show chassis environment sib

List of Syntax

Syntax on page 920
Syntax (TX Matrix router) on page 920
Syntax (TX Matrix Plus Router) on page 920

Syntax

show chassis environment sib
<*slot*>

Syntax (TX Matrix router)

show chassis environment sib
<lcc *number* | scc | *slot*>

Syntax (TX Matrix Plus Router)

show chassis environment sib
<*sib-slot* | lcc *number* | sfc *number* | f13 *sib-slot* | f2s *sib-slot/sib-f2s-slot-number*>

Release Information

Command introduced before Junos OS Release 7.4.
sfc option introduced in Junos OS Release 9.6. for the TX Matrix Plus router.
Command introduced in Junos OS 12.1X48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS 12.1 for T4000 Core Routers.

Description

Display Switch Interface Board (SIB) environmental information.

Options

none—Display environmental information about all SIBs. On a TX Matrix router, display environmental information about all SIBs on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about all SIBs on the TX Matrix Plus router and its attached routers .

f13 ***sib-slot***—(TX Matrix Plus routers only) (Optional) Display SIB F13 environmental information only. Replace ***sib-slot*** with one of the following values: **0**, **1**, **3**, **4**, **6**, **7**, **8**, **9**, **11**, or **12**. (Slots 2, 5, 10, 13, 14, and 15 are unused).

f2s ***sib-slot/sib-f2s-slot-number***—(TX Matrix Plus routers only) (Optional) Display SIB F2s environmental information only. Replace ***sib-slot*** with a value from **0** through **4**, followed by a ***sib-f2s-slot-number*** value of **0**, **2**, **4** or **6**.

lcc ***number***—(TX Matrix router, and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc—(TX Matrix routers only) (Optional) Display environmental information about the SIB in the TX Matrix router (switch-card chassis).

sfc—(TX Matrix Plus routers only) (Optional) On a TX Matrix Plus router, display environmental information about the SIB in the TX Matrix Plus router (switch-fabric chassis).

sib-slot—(Optional) Display environmental information about the specified SIB. For the M320 router, replace ***sib-slot*** with a value from **0** through **3**. For the T640, T1600, T4000, and TX Matrix routers, replace ***sib-slot*** with a value from **0** through **4**. For the TX Matrix Plus router, see f13 *sib-slot* and f2s *sib-slot/sib-f2s-slot-number*. For the T320 router, replace ***sib-slot*** with a value from **0** through **2**. For the PTX5000 Packet Transport Router, replace ***sib-slot*** with a value from **0** through **8**.

Required Privilege Level

view

Related Documentation

- request chassis sib on page 659
- show chassis sibs on page 1519
- Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 190
- *M320 SIB Description*

List of Sample Output

show chassis environment sib (M320 Router) on page 922
show chassis environment sib 1 (T640 Router) on page 923
show chassis environment sib 1 (T4000 Router) on page 923
show chassis environment sib scc (TX Matrix Router) on page 924
show chassis environment sib (TX Matrix Plus Router) on page 925
show chassis environment sib sfc (TX Matrix Plus Router) on page 934
show chassis environment sib f13 (TX Matrix Plus Router) on page 940
show chassis environment sib f2s (TX Matrix Plus Router) on page 940
show chassis environment sib (TX Matrix Plus router with 3D SIBs) on page 941
show chassis environment sib (PTX5000 Packet Transport Router) on page 943

Output Fields

Table 64 on page 922 lists the output fields for the **show chassis environment sib** command. Output fields are listed in the approximate order in which they appear.

Table 64: show chassis environment sib Output Fields

Field Name	Field Description
SIB slot status	SIB slot number: • **0** through **3** on an M320 router. • **0** or **2** on a T320 router. • **0** through **4** on a T640, T1600, T4000, or TX Matrix router. • **0**, **1**, **3**, **4**, **6**, **7**, **8**, **9**, **11**, or **12** for F13 SIBs on a TX Matrix Plus router. (Slots 2, 5, 10, 13, 14, and 15 are unused). • **0** through **4**, followed by **0**, **2**, **4**, or **6** for F2S SIBs on a TX Matrix Plus router. For example, **SIB F2S 0/4**. • **0** through **8** on a PTX5000 Packet Transport Router.
State	Status of the SIB: • **Online**—SIB is online and running. • **Offline**—SIB is powered down. • **Spare** (T640, T1600, T4000, and TX Matrix routers only)—SIB is redundant and will move to active state if one of the working SIBs fails. Only four of the SIBs are active at any time. The fifth one is marked **Spare**. It is activated if there is a fault on one of the active SIBs. Online standby (TX Matrix Plus router only).
Temperature	Temperature of the air flowing past the SIB. On PTX Series Packet Transport Routers, separate temperatures are displayed for **Intake**, **Exhaust**, and **Junction**.
Power	Information about the voltage supplied to the SIB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Sample Output

show chassis environment sib (M320 Router)

```
user@host> show chassis environment sib
SIB 0 status:
  State                            Online
  Temperature                   34 degrees C / 93 degrees F
  Power:
    GROUND                       0 mV
    1.8 V                     1805 mV
    2.5 V                     2498 mV
    3.3 V                     3306 mV
    1.8 V bias                1789 mV
    3.3 V bias                3299 mV
    5.0 V bias                5003 mV
    8.0 V bias                7374 mV
SIB 1 status:
  State                            Online
  Temperature                   35 degrees C / 95 degrees F
  Power:
    GROUND                       0 mV
```



```
    1.8 V                     1814 mV
    2.5 V                     2477 mV
    3.3 V                     3319 mV
    1.8 V bias                1792 mV
    3.3 V bias                3291 mV
    5.0 V bias                4981 mV
    8.0 V bias                7335 mV
SIB 2 status:
  State                          Online
  Temperature                 33 degrees C / 91 degrees F
  Power:
    GROUND                       0 mV
    1.8 V                     1811 mV
    2.5 V                     2489 mV
    3.3 V                     3330 mV
    1.8 V bias                1797 mV
    3.3 V bias                3304 mV
    5.0 V bias                5025 mV
    8.0 V bias                7330 mV
SIB 3 status:
  State                          Online
  Temperature                 37 degrees C / 98 degrees F
  Power:
    GROUND                       0 mV
    1.8 V                     1798 mV
    2.5 V                     2481 mV
    3.3 V                     3328 mV
    1.8 V bias                1792 mV
    3.3 V bias                3313 mV
    5.0 V bias                5013 mV
    8.0 V bias                7467 mV
```

show chassis environment sib 1 (T640 Router)

```
user@host> show chassis environment sib 1
SIB 1 status:
  State                          Online
  Temperature                 39 degrees C / 102 degrees F
  Power:
    GROUND                       0 mV
    1.8 V                     1809 mV
    2.5 V                     2478 mV
    3.3 V                     3308 mV
    1.8 V bias                1794 mV
    3.3 V bias                3274 mV
    5.0 V bias                4996 mV
    8.0 V bias                7247 mV
```

show chassis environment sib 1 (T4000 Router)

```
user@host> show chassis environment sib 1
SIB 1 status:
  State                     Online
  Temperature               42 degrees C / 107 degrees F
  Power
    8.0 V bias                8100 mV
    3.3 V bias                3284 mV
    0.9 V bias                 904 mV
    1.1 V bias                1090 mV
    1.5 V bias                1488 mV
    2.5 V bias                2504 mV
```

```
    9.0 V                       8940 mV
    3.3 V                       3288 mV
    XF0 1.0 V                    998 mV
    XF0 1.0 V LDO                994 mV
    PCIe SW 1.0 V                990 mV
    XF0 1.8 V                   1788 mV
    XF1 1.0 V                   1002 mV
    XF2 1.0 V                   1002 mV
    XF3 1.0 V                    998 mV
    1.2 V                       1194 mV
    XF1 1.0 V LDO               1000 mV
    XF2 1.0 V LDO                998 mV
    XF3 1.0 V LDO                998 mV
    XF1 1.8 V                   1798 mV
    XF2 1.8 V                   1800 mV
    XF3 1.8 V                   1794 mV
    1.5 V                       1488 mV
    SW 3.3 V                    3320 mV
```

show chassis environment sib scc (TX Matrix Router)

```
user@host> show chassis environment sib scc
scc-re0:
--------------------------------------------------------------------------
SIB 3 status:
  State                         Offline
  Reason                        Offlined by button press
  Temperature                 0 degrees C / 32 degrees F
  Power:
    GROUND                    0 mV
    1.8 V                     0 mV
    2.5 V                     0 mV
    3.3 V                     0 mV
    1.8 V bias                0 mV
    3.3 V bias                0 mV
    5.0 V bias                0 mV
    8.0 V bias                0 mV
SIB 4 status:
  State                         Online
  Temperature                42 degrees C / 107 degrees F
  Temperature (B)            41 degrees C / 105 degrees F
  Power:
    GROUND                    0 mV
    1.8 V                  1787 mV
    2.5 V                  2488 mV
    3.3 V                  3294 mV
    1.8 V bias             1787 mV
    3.3 V bias             3306 mV
    5.0 V bias             5010 mV
    8.0 V bias             7418 mV
  Power (B):
    GROUND                    0 mV
    1.8 V                  1785 mV
    2.5 V                  2485 mV
    3.3 V                  3289 mV
    1.8 V bias             1799 mV
    3.3 V bias             3284 mV
    5.0 V bias             4979 mV
    8.0 V bias             7882 mV
```


show chassis environment sib (TX Matrix Plus Router)

```
user@host> show chassis environment sib
sfc0-re0:
--------------------------------------------------------------------------
SIB F13 0 status:
  State                      Online - Standby
  Temperature                54 degrees C / 129 degrees F
  Temperature (B)            50 degrees C / 122 degrees F
  Power
    1.2 V_0                   1205 mV
    1.2 V_1                   1202 mV
    1.2 V_2                   1205 mV
    1.2 V_3                   1208 mV
    1.5 V_0                   1501 mV
    1.5 V_1                   1508 mV
    1.8 V                     1798 mV
    2.5 V                     2510 mV
    3.3 V                     3312 mV
    9.0 V                     8991 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2510 mV
    3.3 V                     3318 mV
    9.0 V                     9024 mV
SIB F13 1 status:
  State                      Online - Standby
  Temperature                45 degrees C / 113 degrees F
  Temperature (B)            42 degrees C / 107 degrees F
  Power
    1.2 V_0                   1202 mV
    1.2 V_1                   1198 mV
    1.2 V_2                   1202 mV
    1.2 V_3                   1202 mV
    1.5 V_0                   1498 mV
    1.5 V_1                   1501 mV
    1.8 V                     1811 mV
    2.5 V                     2504 mV
    3.3 V                     3292 mV
    9.0 V                     8991 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2507 mV
    3.3 V                     3306 mV
    9.0 V                     8970 mV
SIB F13 3 status:
  State                      Online
  Temperature                48 degrees C / 118 degrees F
  Temperature (B)            44 degrees C / 111 degrees F
  Power
    1.2 V_0                   1205 mV
    1.2 V_1                   1202 mV
    1.2 V_2                   1202 mV
    1.2 V_3                   1202 mV
    1.5 V_0                   1508 mV
    1.5 V_1                   1504 mV
    1.8 V                     1798 mV
    2.5 V                     2520 mV
    3.3 V                     3300 mV
    9.0 V                     9009 mV
    9.0 V bias                   0 mV
```



```
  Power (B)
    2.5 V                     2504 mV
    3.3 V                     3312 mV
    9.0 V                     9006 mV
SIB F13 4 status:
  State                      Online
  Temperature                44 degrees C / 111 degrees F
  Temperature (B)            40 degrees C / 104 degrees F
Power
    1.2 V_0                   1205 mV
    1.2 V_1                   1205 mV
    1.2 V_2                   1202 mV
    1.2 V_3                   1205 mV
    1.5 V_0                   1508 mV
    1.5 V_1                   1508 mV
    1.8 V                     1811 mV
    2.5 V                     2510 mV
    3.3 V                     3312 mV
    9.0 V                     8970 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2513 mV
    3.3 V                     3318 mV
    9.0 V                     9048 mV
SIB F13 6 status:
  State                      Online
  Temperature                50 degrees C / 122 degrees F
  Temperature (B)            46 degrees C / 114 degrees F
  Power
    1.2 V_0                   1195 mV
    1.2 V_1                   1205 mV
    1.2 V_2                   1202 mV
    1.2 V_3                   1202 mV
    1.5 V_0                   1495 mV
    1.5 V_1                   1495 mV
    1.8 V                     1801 mV
    2.5 V                     2494 mV
    3.3 V                     3300 mV
    9.0 V                     8991 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2500 mV
    3.3 V                     3300 mV
    9.0 V                     9006 mV
SIB F13 7 status:
  State                      Online
  Temperature                52 degrees C / 125 degrees F
  Temperature (B)            49 degrees C / 120 degrees F
  Power
    1.2 V_0                   1202 mV
    1.2 V_1                   1202 mV
    1.2 V_2                   1198 mV
    1.2 V_3                   1185 mV
    1.5 V_0                   1501 mV
    1.5 V_1                   1492 mV
    1.8 V                     1795 mV
    2.5 V                     2491 mV
    3.3 V                     3286 mV
    9.0 V                     8892 mV
    9.0 V bias                   0 mV
  Power (B)
```



```
    2.5 V                      2507 mV
    3.3 V                      3306 mV
    9.0 V                      8952 mV
SIB F13 8 status:
  State                       Online
  Temperature                 55 degrees C / 131 degrees F
  Temperature (B)             50 degrees C / 122 degrees F
  Power
    1.2 V_0                    1208 mV
    1.2 V_1                    1205 mV
    1.2 V_2                    1205 mV
    1.2 V_3                    1211 mV
    1.5 V_0                    1514 mV
    1.5 V_1                    1508 mV
    1.8 V                      1807 mV
    2.5 V                      2516 mV
    3.3 V                      3324 mV
    9.0 V                      9027 mV
    9.0 V bias                    0 mV
  Power (B)
    2.5 V                      2520 mV
    3.3 V                      3318 mV
    9.0 V                      9066 mV
SIB F13 9 status:
  State                       Online
  Temperature                 46 degrees C / 114 degrees F
  Temperature (B)             41 degrees C / 105 degrees F
  Power
    1.2 V_0                    1208 mV
    1.2 V_1                    1202 mV
    1.2 V_2                    1208 mV
    1.2 V_3                    1202 mV
    1.5 V_0                    1504 mV
    1.5 V_1                    1504 mV
    1.8 V                      1817 mV
    2.5 V                      2516 mV
    3.3 V                      3312 mV
    9.0 V                      9009 mV
    9.0 V bias                    0 mV
  Power (B)
    2.5 V                      2510 mV
    3.3 V                      3312 mV
    9.0 V                      9024 mV
SIB F13 11 status:
  State                       Online
  Temperature                 47 degrees C / 116 degrees F
  Temperature (B)             42 degrees C / 107 degrees F
  Power
    1.2 V_0                    1202 mV
    1.2 V_1                    1205 mV
    1.2 V_2                    1202 mV
    1.2 V_3                    1202 mV
    1.5 V_0                    1501 mV
    1.5 V_1                    1501 mV
    1.8 V                      1801 mV
    2.5 V                      2510 mV
    3.3 V                      3312 mV
    9.0 V                      8979 mV
    9.0 V bias                    0 mV
  Power (B)
    2.5 V                      2252 mV
```



```
      3.3 V                    5014 mV
      9.0 V                    9954 mV
  SIB F13 12 status:
    State                     Online
    Temperature               45 degrees C / 113 degrees F
    Temperature (B)           40 degrees C / 104 degrees F
    Power
      1.2 V_0                  1211 mV
      1.2 V_1                  1208 mV
      1.2 V_2                  1205 mV
      1.2 V_3                  1205 mV
      1.5 V_0                  1511 mV
      1.5 V_1                  1501 mV
      1.8 V                    1817 mV
      2.5 V                    2504 mV
      3.3 V                    3318 mV
      9.0 V                    9027 mV
      9.0 V bias                  0 mV
   Power (B)
      2.5 V                    2520 mV
      3.3 V                    3338 mV
      9.0 V                    9006 mV
  SIB F2S 0/0 status:
    State                     Online - Standby
    Temperature               40 degrees C / 104 degrees F
    Power
      1.2 V_1                     0 mV
      1.2 V_ASF                1198 mV
      1.2 V_ASF_B              1198 mV
      1.2 V_ASF_D              1202 mV
      1.5 V                    1498 mV
      1.8 V                    1814 mV
      3.3 V                    3300 mV
      3.3 V bias               3300 mV
      3.3 V ASF                3286 mV
      9.0 V                    8250 mV
  SIB F2S 0/2 status:
    State                     Online - Standby
    Temperature               40 degrees C / 104 degrees F
    Power
      1.2 V_1                     0 mV
      1.2 V_ASF                1198 mV
      1.2 V_ASF_B              1195 mV
      1.2 V_ASF_D              1202 mV
      1.5 V                    1498 mV
      1.8 V                    1807 mV
      3.3 V                    3300 mV
      3.3 V bias               3300 mV
      3.3 V ASF                3286 mV
      9.0 V                    8250 mV
  SIB F2S 0/4 status:
    State                     Online - Standby
    Temperature               40 degrees C / 104 degrees F
    Power
      1.2 V_1                     0 mV
      1.2 V_ASF                1202 mV
      1.2 V_ASF_B              1198 mV
      1.2 V_ASF_D              1202 mV
      1.5 V                    1504 mV
      1.8 V                    1817 mV
      3.3 V                    3300 mV
```



```
      3.3 V bias                3300 mV
      3.3 V ASF                 3306 mV
      9.0 V                     8250 mV
  SIB F2S 0/6 status:
    State                      Online - Standby
    Temperature                39 degrees C / 102 degrees F
    Power
      1.2 V_1                      0 mV
      1.2 V_ASF                 1202 mV
      1.2 V_ASF_B               1198 mV
      1.2 V_ASF_D               1202 mV
      1.5 V                     1495 mV
      1.8 V                     1814 mV
      3.3 V                     3300 mV
      3.3 V bias                3300 mV
      3.3 V ASF                 3280 mV
      9.0 V                     8250 mV
  SIB F2S 1/0 status:
    State                      Online
    Temperature                39 degrees C / 102 degrees F
    Power
      1.2 V_1                      0 mV
      1.2 V_ASF                 1195 mV
      1.2 V_ASF_B               1192 mV
      1.2 V_ASF_D               1195 mV
      1.5 V                     1488 mV
      1.8 V                     1798 mV
      3.3 V                     3300 mV
      3.3 V bias                3300 mV
      3.3 V ASF                 3280 mV
      9.0 V                     8250 mV
  SIB F2S 1/2 status:
    State                      Online
    Temperature                39 degrees C / 102 degrees F
    Power
      1.2 V_1                      0 mV
      1.2 V_ASF                 1205 mV
      1.2 V_ASF_B               1202 mV
      1.2 V_ASF_D               1205 mV
      1.5 V                     1501 mV
      1.8 V                     1820 mV
      3.3 V                     3300 mV
      3.3 V bias                3300 mV
      3.3 V ASF                 3306 mV
      9.0 V                     8250 mV
  SIB F2S 1/4 status:
    State                      Online
    Temperature                39 degrees C / 102 degrees F
    Power
      1.2 V_1                      0 mV
      1.2 V_ASF                 1198 mV
      1.2 V_ASF_B               1195 mV
      1.2 V_ASF_D               1195 mV
      1.5 V                     1498 mV
      1.8 V                     1811 mV
      3.3 V                     3300 mV
      3.3 V bias                3300 mV
      3.3 V ASF                 3300 mV
      9.0 V                     8250 mV
  SIB F2S 1/6 status:
    State                      Online
```

```
    Temperature               39 degrees C / 102 degrees F
    Power
      1.2 V_1                    0 mV
      1.2 V_ASF               1195 mV
      1.2 V_ASF_B             1195 mV
      1.2 V_ASF_D             1198 mV
      1.5 V                   1498 mV
      1.8 V                   1807 mV
      3.3 V                   3306 mV
      3.3 V bias              3300 mV
      3.3 V ASF               3292 mV
      9.0 V                   8250 mV
  SIB F2S 2/0 status:
    State                     Online
    Temperature               39 degrees C / 102 degrees F
    Power
      1.2 V_1                    0 mV
      1.2 V_ASF               1195 mV
      1.2 V_ASF_B             1195 mV
      1.2 V_ASF_D             1198 mV
      1.5 V                   1498 mV
      1.8 V                   1804 mV
      3.3 V                   3300 mV
      3.3 V bias              3300 mV
      3.3 V ASF               3286 mV
      9.0 V                   8250 mV
  SIB F2S 2/2 status:
    State                     Online
  Temperature               38 degrees C / 100 degrees F
    Power
      1.2 V_1                    0 mV
      1.2 V_ASF               1195 mV
      1.2 V_ASF_B             1195 mV
      1.2 V_ASF_D             1198 mV
      1.5 V                   1495 mV
      1.8 V                   1807 mV
      3.3 V                   3300 mV
      3.3 V bias              3300 mV
      3.3 V ASF               3300 mV
      9.0 V                   8250 mV
  SIB F2S 2/4 status:
    State                     Online
    Temperature               38 degrees C / 100 degrees F
    Power
      1.2 V_1                    0 mV
      1.2 V_ASF               1198 mV
      1.2 V_ASF_B             1195 mV
      1.2 V_ASF_D             1198 mV
      1.5 V                   1501 mV
      1.8 V                   1804 mV
      3.3 V                   3286 mV
      3.3 V bias              3292 mV
      3.3 V ASF               3300 mV
      9.0 V                   8230 mV
  SIB F2S 2/6 status:
    State                     Online
    Temperature               38 degrees C / 100 degrees F
    Power
      1.2 V_1                    0 mV
      1.2 V_ASF               1202 mV
      1.2 V_ASF_B             1198 mV
```



```
      1.2 V_ASF_D              1202 mV
      1.5 V                    1501 mV
      1.8 V                    1817 mV
      3.3 V                    3300 mV
      3.3 V bias               3300 mV
      3.3 V ASF                3318 mV
      9.0 V                    8250 mV
  SIB F2S 3/0 status:
    State                     Online
    Temperature               38 degrees C / 100 degrees F
    Power
      1.2 V_1                     0 mV
      1.2 V_ASF                1195 mV
      1.2 V_ASF_B              1195 mV
      1.2 V_ASF_D              1198 mV
      1.5 V                    1501 mV
      1.8 V                    1814 mV
      3.3 V                    3300 mV
      3.3 V bias               3300 mV
      3.3 V ASF                3274 mV
      9.0 V                    8250 mV
  SIB F2S 3/2 status:
    State                     Online
    Temperature               37 degrees C / 98 degrees F
    Power
      1.2 V_1                     0 mV
      1.2 V_ASF                1202 mV
      1.2 V_ASF_B              1195 mV
      1.2 V_ASF_D              1195 mV
      1.5 V                    1495 mV
      1.8 V                    1804 mV
      3.3 V                    3300 mV
      3.3 V bias               3300 mV
      3.3 V ASF                3286 mV
      9.0 V                    8250 mV
  SIB F2S 3/4 status:
    State                     Online
    Temperature               37 degrees C / 98 degrees F
    Power
      1.2 V_1                     0 mV
      1.2 V_ASF                1205 mV
      1.2 V_ASF_B              1198 mV
      1.2 V_ASF_D              1202 mV
      1.5 V                    1501 mV
      1.8 V                    1811 mV
      3.3 V                    3300 mV
      3.3 V bias               3300 mV
      3.3 V ASF                3318 mV
      9.0 V                    8250 mV
  SIB F2S 3/6 status:
    State                     Online
    Temperature               37 degrees C / 98 degrees F
    Power
      1.2 V_1                     0 mV
      1.2 V_ASF                1205 mV
      1.2 V_ASF_B              1202 mV
      1.2 V_ASF_D              1202 mV
      1.5 V                    1511 mV
      1.8 V                    1820 mV
      3.3 V                    3306 mV
      3.3 V bias               3306 mV
```

```
    3.3 V ASF                  3318 mV
    9.0 V                      8265 mV
SIB F2S 4/0 status:
  State                       Online
  Temperature                 36 degrees C / 96 degrees F
  Power
    1.2 V_1                       0 mV
    1.2 V_ASF                  1198 mV
    1.2 V_ASF_B                1198 mV
    1.2 V_ASF_D                1198 mV
    1.5 V                      1501 mV
    1.8 V                      1814 mV
    3.3 V                      3292 mV
    3.3 V bias                 3292 mV
    3.3 V ASF                  3312 mV
    9.0 V                      8230 mV
SIB F2S 4/2 status:
  State                       Online
  Temperature                 37 degrees C / 98 degrees F
  Power
    1.2 V_1                       0 mV
    1.2 V_ASF                  1198 mV
    1.2 V_ASF_B                1192 mV
    1.2 V_ASF_D                1195 mV
    1.5 V                      1495 mV
    1.8 V                      1807 mV
    3.3 V                      3300 mV
    3.3 V bias                 3300 mV
    3.3 V ASF                  3300 mV
    9.0 V                      8250 mV
SIB F2S 4/4 status:
  State                       Online
  Temperature                 36 degrees C / 96 degrees F
  Power
    1.2 V_1                       0 mV
    1.2 V_ASF                  1202 mV
    1.2 V_ASF_B                1195 mV
    1.2 V_ASF_D                1202 mV
   1.5 V                      1501 mV
    1.8 V                      1814 mV
    3.3 V                      3300 mV
    3.3 V bias                 3300 mV
    3.3 V ASF                  3312 mV
    9.0 V                      8250 mV
SIB F2S 4/6 status:
  State                       Online
  Temperature                 36 degrees C / 96 degrees F
  Power
    1.2 V_1                       0 mV
    1.2 V_ASF                  1198 mV
    1.2 V_ASF_B                1195 mV
    1.2 V_ASF_D                1198 mV
    1.5 V                      1498 mV
    1.8 V                      1820 mV
    3.3 V                      3292 mV
    3.3 V bias                 3292 mV
    3.3 V ASF                  3286 mV
    9.0 V                      8230 mV

lcc0-re0:
--------------------------------------------------------------------------
```



```
SIB 0 status:
  State                       Online - Standby
  Temperature                 49 degrees C / 120 degrees F
  Temperature (B)             42 degrees C / 107 degrees F
  Power
    1.2 V                      1204 mV
    1.5 V                      1484 mV
    2.5 V                      2500 mV
    3.3 V                      3312 mV
    3.3 V bias                 3312 mV
    5.0 V bias                 4956 mV
    8.0 V bias                 7740 mV
    9.0 V                      8880 mV
  Power (B)
    1.2 V                      1206 mV
    2.5 V                      2500 mV
    3.3 V                      3316 mV
    9.0 V                      8988 mV
SIB 1 status:
  State                       Online
  Temperature                 49 degrees C / 120 degrees F
  Temperature (B)             42 degrees C / 107 degrees F
  Power
    1.2 V                      1202 mV
    1.5 V                      1482 mV
    2.5 V                      2500 mV
    3.3 V                      3296 mV
    3.3 V bias                 3288 mV
    5.0 V bias                 4986 mV
    8.0 V bias                 7800 mV
    9.0 V                      8868 mV
  Power (B)
    1.2 V                      1206 mV
    2.5 V                      2512 mV
    3.3 V                      3312 mV
    9.0 V                      8952 mV
SIB 2 status:
  State                       Online
  Temperature                 49 degrees C / 120 degrees F
  Temperature (B)             42 degrees C / 107 degrees F
  Power
    1.2 V                      1202 mV
  1.5 V                      1480 mV
    2.5 V                      2476 mV
    3.3 V                      3292 mV
    3.3 V bias                 3308 mV
    5.0 V bias                 5010 mV
    8.0 V bias                 7800 mV
    9.0 V                      8880 mV
  Power (B)
    1.2 V                      1204 mV
    2.5 V                      2516 mV
    3.3 V                      3308 mV
    9.0 V                      8988 mV
SIB 3 status:
  State                       Online
  Temperature                 48 degrees C / 118 degrees F
  Temperature (B)             42 degrees C / 107 degrees F
  Power
    1.2 V                      1204 mV
    1.5 V                      1480 mV
```

```
    2.5 V                      2500 mV
    3.3 V                      3292 mV
    3.3 V bias                 3292 mV
    5.0 V bias                 4986 mV
    8.0 V bias                 7812 mV
    9.0 V                      8892 mV
  Power (B)
    1.2 V                      1198 mV
    2.5 V                      2512 mV
    3.3 V                      3308 mV
    9.0 V                      8892 mV
SIB 4 status:
  State                       Online
  Temperature                 48 degrees C / 118 degrees F
  Temperature (B)             42 degrees C / 107 degrees F
  Power
    1.2 V                      1206 mV
    1.5 V                      1482 mV
    2.5 V                      2484 mV
    3.3 V                      3324 mV
    3.3 V bias                 3340 mV
    5.0 V bias                 4980 mV
    8.0 V bias                 7764 mV
    9.0 V                      8784 mV
  Power (B)
    1.2 V                      1202 mV
    2.5 V                      2504 mV
    3.3 V                      3308 mV
    9.0 V                      8820 mV
lcc1-re0:
--------------------------------------------------------------------------
SIB 0 status:
  State                       Online - Standby
  Temperature                 49 degrees C / 120 degrees F
  Temperature (B)             43 degrees C / 109 degrees F
  Power
    1.2 V                      1206 mV
    1.5 V                      1506 mV
    2.5 V                      2496 mV
    3.3 V                      3308 mV
    3.3 V bias                 3296 mV
    5.0 V bias                 4974 mV
    8.0 V bias                 7884 mV
    9.0 V                      8820 mV
  Power (B)
    1.2 V                      1200 mV
    2.5 V                      2508 mV
    3.3 V                      3292 mV
    9.0 V                      8892 mV
...
```

show chassis environment sib sfc (TX Matrix Plus Router)

```
user@host> show chassis environment sib sfc
sfc0-re0:
--------------------------------------------------------------------------
SIB F13 0 status:
  State                       Online - Standby
  Temperature                 54 degrees C / 129 degrees F
  Temperature (B)             50 degrees C / 122 degrees F
  Power
```

```
      1.2 V_0                   1205 mV
      1.2 V_1                   1205 mV
      1.2 V_2                   1208 mV
      1.2 V_3                   1208 mV
      1.5 V_0                   1501 mV
      1.5 V_1                   1508 mV
      1.8 V                     1804 mV
      2.5 V                     2504 mV
      3.3 V                     3312 mV
      9.0 V                     8991 mV
      9.0 V bias                   0 mV
    Power (B)
      2.5 V                     2516 mV
      3.3 V                     3318 mV
      9.0 V                     9048 mV
  SIB F13 1 status:
    State                      Online - Standby
    Temperature                45 degrees C / 113 degrees F
    Temperature (B)            42 degrees C / 107 degrees F
    Power
      1.2 V_0                   1202 mV
      1.2 V_1                   1205 mV
      1.2 V_2                   1198 mV
      1.2 V_3                   1205 mV
      1.5 V_0                   1498 mV
      1.5 V_1                   1495 mV
      1.8 V                     1801 mV
      2.5 V                     2507 mV
      3.3 V                     3306 mV
      9.0 V                     8970 mV
      9.0 V bias                   0 mV
    Power (B)
      2.5 V                     2507 mV
      3.3 V                     3306 mV
      9.0 V                     8970 mV
  SIB F13 3 status:
    State                      Online
    Temperature                48 degrees C / 118 degrees F
    Temperature (B)            43 degrees C / 109 degrees F
    Power
      1.2 V_0                   1208 mV
      1.2 V_1                   1195 mV
      1.2 V_2                   1202 mV
      1.2 V_3                   1198 mV
      1.5 V_0                   1504 mV
      1.5 V_1                   1504 mV
      1.8 V                     1801 mV
      2.5 V                     2510 mV
      3.3 V                     3312 mV
      9.0 V                     8970 mV
      9.0 V bias                   0 mV
    Power (B)
      2.5 V                     2500 mV
      3.3 V                     3332 mV
      9.0 V                     8970 mV
  SIB F13 4 status:
    State                      Online
    Temperature                44 degrees C / 111 degrees F
    Temperature (B)            40 degrees C / 104 degrees F
    Power
      1.2 V_0                   1205 mV
```



```
      1.2 V_1                  1202 mV
      1.2 V_2                  1205 mV
      1.2 V_3                  1202 mV
      1.5 V_0                  1508 mV
      1.5 V_1                  1511 mV
      1.8 V                    1811 mV
      2.5 V                    2510 mV
      3.3 V                    3312 mV
      9.0 V                    8952 mV
      9.0 V bias                  0 mV
    Power (B)
      2.5 V                    2510 mV
      3.3 V                    3306 mV
      9.0 V                    9024 mV
  SIB F13 6 status:
    State                     Online
    Temperature               49 degrees C / 120 degrees F
    Temperature (B)           46 degrees C / 114 degrees F
    Power
      1.2 V_0                  1195 mV
      1.2 V_1                  1198 mV
      1.2 V_2                  1202 mV
      1.2 V_3                  1202 mV
      1.5 V_0                  1501 mV
      1.5 V_1                  1495 mV
      1.8 V                    1801 mV
      2.5 V                    2507 mV
      3.3 V                    3306 mV
      9.0 V                    8979 mV
      9.0 V bias                  0 mV
    Power (B)
      2.5 V                    2497 mV
      3.3 V                    3318 mV
      9.0 V                    9006 mV
  SIB F13 7 status:
    State                     Online
    Temperature               52 degrees C / 125 degrees F
    Temperature (B)           48 degrees C / 118 degrees F
    Power
      1.2 V_0                  1198 mV
      1.2 V_1                  1198 mV
      1.2 V_2                  1202 mV
      1.2 V_3                  1189 mV
      1.5 V_0                  1498 mV
      1.5 V_1                  1498 mV
      1.8 V                    1804 mV
      2.5 V                    2491 mV
      3.3 V                    3292 mV
      9.0 V                    8904 mV
      9.0 V bias                  0 mV
    Power (B)
      2.5 V                    2500 mV
      3.3 V                    3306 mV
      9.0 V                    8952 mV
  SIB F13 8 status:
    State                     Online
    Temperature               54 degrees C / 129 degrees F
    Temperature (B)           49 degrees C / 120 degrees F
    Power
      1.2 V_0                  1211 mV
      1.2 V_1                  1208 mV
```



```
    1.2 V_2                    1208 mV
    1.2 V_3                    1211 mV
    1.5 V_0                    1508 mV
    1.5 V_1                    1511 mV
    1.8 V                      1801 mV
    2.5 V                      2513 mV
    3.3 V                      3324 mV
    9.0 V                      9048 mV
    9.0 V bias                    0 mV
  Power (B)
    2.5 V                      2516 mV
    3.3 V                      3318 mV
    9.0 V                      9102 mV
SIB F13 9 status:
  State                       Online
  Temperature                 46 degrees C / 114 degrees F
  Temperature (B)             41 degrees C / 105 degrees F
  Power
    1.2 V_0                    1205 mV
    1.2 V_1                    1202 mV
    1.2 V_2                    1205 mV
    1.2 V_3                    1198 mV
    1.5 V_0                    1504 mV
    1.5 V_1                    1504 mV
    1.8 V                      1817 mV
    2.5 V                      2507 mV
    3.3 V                      3306 mV
    9.0 V                      8991 mV
    9.0 V bias                    0 mV
  Power (B)
    2.5 V                      2510 mV
    3.3 V                      3332 mV
    9.0 V                      9006 mV
SIB F13 11 status:
  State                       Online
  Temperature                 47 degrees C / 116 degrees F
  Temperature (B)             42 degrees C / 107 degrees F
  Power
    1.2 V_0                    1202 mV
    1.2 V_1                    1205 mV
    1.2 V_2                    1202 mV
    1.2 V_3                    1198 mV
    1.5 V_0                    1501 mV
    1.5 V_1                    1504 mV
    1.8 V                      1807 mV
    2.5 V                      2510 mV
    3.3 V                      3306 mV
    9.0 V                      8991 mV
    9.0 V bias                    0 mV
  Power (B)
    2.5 V                      2249 mV
    3.3 V                      4994 mV
    9.0 V                      9936 mV
SIB F13 12 status:
  State                       Online
  Temperature                 44 degrees C / 111 degrees F
  Temperature (B)             40 degrees C / 104 degrees F
  Power
    1.2 V_0                    1208 mV
    1.2 V_1                    1202 mV
    1.2 V_2                    1208 mV
```



```
      1.2 V_3                    1205 mV
      1.5 V_0                    1511 mV
      1.5 V_1                    1508 mV
      1.8 V                      1814 mV
      2.5 V                      2507 mV
      3.3 V                      3318 mV
      9.0 V                      9039 mV
      9.0 V bias                    0 mV
    Power (B)
      2.5 V                      2516 mV
      3.3 V                      3344 mV
      9.0 V                      9006 mV
  SIB F2S 0/0 status:
    State                       Online - Standby
    Temperature                 40 degrees C / 104 degrees F
    Power
      1.2 V_1                       0 mV
      1.2 V_ASF                  1198 mV
      1.2 V_ASF_B                1198 mV
      1.2 V_ASF_D                1202 mV
      1.5 V                      1498 mV
      1.8 V                      1814 mV
      3.3 V                      3300 mV
      3.3 V bias                 3300 mV
      3.3 V ASF                  3286 mV
      9.0 V                      8250 mV
  SIB F2S 0/2 status:
    State                       Online - Standby
    Temperature                 40 degrees C / 104 degrees F
    Power
      1.2 V_1                       0 mV
      1.2 V_ASF                  1198 mV
      1.2 V_ASF_B                1195 mV
      1.2 V_ASF_D                1202 mV
      1.5 V                      1498 mV
      1.8 V                      1807 mV
      3.3 V                      3300 mV
      3.3 V bias                 3300 mV
      3.3 V ASF                  3292 mV
      9.0 V                      8250 mV
  SIB F2S 0/4 status:
    State                       Online - Standby
    Temperature                 40 degrees C / 104 degrees F
    Power
      1.2 V_1                       0 mV
      1.2 V_ASF                  1198 mV
      1.2 V_ASF_B                1195 mV
      1.2 V_ASF_D                1202 mV
      1.5 V                      1501 mV
      1.8 V                      1817 mV
      3.3 V                      3300 mV
      3.3 V bias                 3300 mV
      3.3 V ASF                  3306 mV
      9.0 V                      8250 mV
  SIB F2S 0/6 status:
    State                       Online - Standby
    Temperature                 39 degrees C / 102 degrees F
    Power
      1.2 V_1                       0 mV
      1.2 V_ASF                  1202 mV
      1.2 V_ASF_B                1198 mV
```



```
    1.2 V_ASF_D              1198 mV
    1.5 V                    1495 mV
    1.8 V                    1814 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3280 mV
    9.0 V                    8250 mV
SIB F2S 1/0 status:
  State                     Online
  Temperature               39 degrees C / 102 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1195 mV
    1.2 V_ASF_B              1192 mV
    1.2 V_ASF_D              1195 mV
    1.5 V                    1492 mV
    1.8 V                    1798 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3280 mV
    9.0 V                    8250 mV
SIB F2S 1/2 status:
  State                     Online
  Temperature               39 degrees C / 102 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1205 mV
    1.2 V_ASF_B              1202 mV
    1.2 V_ASF_D              1205 mV
    1.5 V                    1504 mV
    1.8 V                    1820 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3306 mV
    9.0 V                    8250 mV
SIB F2S 1/4 status:
  State                     Online
  Temperature               39 degrees C / 102 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1202 mV
    1.2 V_ASF_B              1195 mV
    1.2 V_ASF_D              1198 mV
    1.5 V                    1498 mV
    1.8 V                    1811 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3300 mV
    9.0 V                    8250 mV
SIB F2S 1/6 status:
  State                     Online
  Temperature               39 degrees C / 102 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1195 mV
    1.2 V_ASF_B              1192 mV
    1.2 V_ASF_D              1198 mV
    1.5 V                    1498 mV
    1.8 V                    1807 mV
    3.3 V                    3306 mV
    3.3 V bias               3300 mV
```

```
    3.3 V ASF                 3292 mV
    9.0 V                     8250 mV
SIB F2S 2/0 status:
  State                      Online
  Temperature                38 degrees C / 100 degrees F
  Power
    1.2 V_1                      0 mV
    1.2 V_ASF                 1195 mV
    1.2 V_ASF_B               1195 mV
    1.2 V_ASF_D               1198 mV
    1.5 V                     1498 mV
    1.8 V                     1804 mV
    3.3 V                     3300 mV
    3.3 V bias                3300 mV
    3.3 V ASF                 3292 mV
    9.0 V                     8250 mV
...
```

show chassis environment sib f13 (TX Matrix Plus Router)

```
user@host> show chassis environment sib f13 0
SIB F13 0 status:
  State                      Online - Standby
  Temperature                54 degrees C / 129 degrees F
  Temperature (B)            50 degrees C / 122 degrees F
  Power
    1.2 V_0                   1202 mV
    1.2 V_1                   1202 mV
    1.2 V_2                   1208 mV
    1.2 V_3                   1208 mV
    1.5 V_0                   1501 mV
    1.5 V_1                   1504 mV
    1.8 V                     1801 mV
    2.5 V                     2504 mV
    3.3 V                     3318 mV
    9.0 V                     8991 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2510 mV
    3.3 V                     3318 mV
    9.0 V                     9024 mV
```

show chassis environment sib f2s (TX Matrix Plus Router)

```
user@host> show chassis environment sib f2s 0/2
SIB F2S 0/2 status:
  State                      Online - Standby
  Temperature                40 degrees C / 104 degrees F
  Power
    1.2 V_1                      0 mV
    1.2 V_ASF                 1198 mV
    1.2 V_ASF_B               1195 mV
    1.2 V_ASF_D               1202 mV
    1.5 V                     1501 mV
    1.8 V                     1807 mV
    3.3 V                     3300 mV
    3.3 V bias                3300 mV
    3.3 V ASF                 3286 mV
    9.0 V                     8250 mV
```

show chassis environment sib (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis environment sib
sfc0-re0:
--------------------------------------------------------------------------
SIB F13 0 status:
  State                        Online
  Board Temperature            44 degrees C / 111 degrees F
  XF Junction Temperature      62 degrees C / 143 degrees F
  Power
    XF F1 LCC0 1.0 V            999 mV
    PCIe Switch 1.0 V          1000 mV
    XF F3 LCC0 1.0 V           1000 mV
    XF F1/F3 LCC0 1.2 V        1199 mV
    XF F1 LCC1 1.0 V           1000 mV
    XF F1/F3 LCC1 1.2 V        1199 mV
    XF F3 LCC1 1.0 V           1000 mV
    XF F1/F3 1.5 V             1499 mV
    XF RC LCC0 Base 1.0        1000 mV
    XF RC Base 1.2 V           1200 mV
    XF RC LCC1 Base 1.0        1000 mV
    XF RC Base 1.5 V           1499 mV
    3.3 V Base                 3300 mV
    VSC8248 Base 1.8V          1796 mV
    FPGA Core 0.9 V             899 mV
    2.5 V Base                 2500 mV
    ltc3880-3.3v-bias          3343 mV
    CXP Base 4.0 V             3999 mV
    XF RC LCC0 Mezz 1.0        1000 mV
    XF RC Mezz 1.2 V           1199 mV
    XF RC LCC1 Mezz 1.0         999 mV
    XF RC Mezz 1.5 V           1499 mV
    3.3 V Mezz                 3299 mV
    VSC8248 Mezz 1.8V          1800 mV
    CXP Mezz 4.0 V             3999 mV
 [...Output Truncated...]
SIB F2S 0/0 status:
  State                        Online
  Board Temperature            32 degrees C / 89 degrees F
  XF Junction Temperature      41 degrees C / 105 degrees F
  Power
    XF F2S 1.8 V LDO           1775 mV
    XF F2S 1.0 V AN             992 mV
    XF F2S 1.0 V               1002 mV
    XF F2S 1.5 V               1488 mV
    1.5 V Base                 2500 mV
    3.3 V bias                 3306 mV
    3.3 V Base                 3280 mV
    12.0 V Base               11928 mV
 [...Output Truncated...]
SIB F2S 2/6 status:
  State                        Online
  Board Temperature            28 degrees C / 82 degrees F
  XF Junction Temperature      40 degrees C / 104 degrees F
  Power
    XF F2S 1.8 V LDO           1782 mV
    XF F2S 1.0 V AN             999 mV
    XF F2S 1.0 V               1005 mV
    XF F2S 1.5 V               1498 mV
    1.5 V Base                 2510 mV
    3.3 V bias                 3292 mV
```

```
    3.3 V Base                3292 mV
    12.0 V Base              12024 mV

lcc0-re0:
--------------------------------------------------------------------------
SIB 0 status:
  State                      Online
  Temperature                41 degrees C / 105 degrees F
  Temperature (B)            Absent
  Max Jn Temperature         48 degrees C / 118 degrees F
  Power
    8.0 V bias                8156 mV
    3.3 V bias                3284 mV
    FPGA 0.9 V bias            908 mV
    FPGA 1.1 V bias           1086 mV
    FPGA 1.5 V bias           1487 mV
    FPGA 2.5 V bias           2525 mV
    3.3 V                     3282 mV
    1.5 V                     1487 mV
    XF HSS 1.5 V              1501 mV
    XF1 1.0 V                 1001 mV
    XF2 1.0 V                 1003 mV
    XF3 1.0 V                  998 mV
    XF1 1.8 V LDO             1782 mV
    XF2 1.8 V LDO             1792 mV
    XF3 1.8 V LDO             1782 mV
    CLK  BUF 2.5 V LDO        2493 mV
    XF1 1.0 V LDO              991 mV
    XF2 1.0 V LDO              991 mV
    XF3 1.0 V LDO              991 mV
    PCIe SW 3.3 V             3274 mV
    PCIe 1.0 V                 996 mV
    RETIMER 1.2 V             1174 mV
    RETIMER IO 1.8 V          1770 mV
                                 0 mV
  Power (B)
    1.2 V                        0 mV
    2.5 V                        0 mV
    3.3 V                        0 mV
    9.0 V                        0 mV
 [...Output Truncated...]
lcc2-re0:
--------------------------------------------------------------------------
SIB 0 status:
  State                      Online
  Temperature                42 degrees C / 107 degrees F
  Temperature (B)            Absent
  Max Jn Temperature         51 degrees C / 123 degrees F
  Power
    8.0 V bias                8146 mV
    3.3 V bias                3277 mV
    FPGA 0.9 V bias            903 mV
    FPGA 1.1 V bias           1089 mV
    FPGA 1.5 V bias           1479 mV
    FPGA 2.5 V bias           2515 mV
    3.3 V                     3277 mV
    1.5 V                     1482 mV
    XF HSS 1.5 V              1501 mV
    XF1 1.0 V                 1001 mV
    XF2 1.0 V                 1003 mV
    XF3 1.0 V                  998 mV
```



```
    XF1 1.8 V LDO              1787 mV
    XF2 1.8 V LDO              1792 mV
    XF3 1.8 V LDO              1792 mV
    CLK  BUF 2.5 V LDO         2481 mV
    XF1 1.0 V LDO               986 mV
    XF2 1.0 V LDO               993 mV
    XF3 1.0 V LDO               991 mV
    PCIe SW 3.3 V              3279 mV
    PCIe 1.0 V                  991 mV
    RETIMER 1.2 V              1179 mV
    RETIMER IO 1.8 V           1772 mV
                                  0 mV
  Power (B)
    1.2 V                         0 mV
    2.5 V                         0 mV
    3.3 V                         0 mV
    9.0 V                         0 mV
 [...Output Truncated...]
```

show chassis environment sib (PTX5000 Packet Transport Router)

```
user@host> show chassis environment sib
SIB 0 status:
  State                       Online
  Exhaust Temperature         37 degrees C / 98 degrees F
  Junction Temperature        43 degrees C / 109 degrees F
  Power
    1.0 V                      1000 mV
    1.5 V                      1499 mV
    1.2 V                      1199 mV
    3.3 V                      3300 mV
    0.9 V                       900 mV
    2.5 V                      2500 mV
    3.3 V bias                 3298 mV
SIB 1 status:
  State                       Online
  Exhaust Temperature         36 degrees C / 96 degrees F
  Junction Temperature        45 degrees C / 113 degrees F
  Power
    1.0 V                      1000 mV
    1.5 V                      1500 mV
    1.2 V                      1200 mV
    3.3 V                      3300 mV
    0.9 V                       900 mV
    2.5 V                      2499 mV
    3.3 V bias                 3321 mV
SIB 2 status:
  State                       Online
  Exhaust Temperature         37 degrees C / 98 degrees F
  Junction Temperature        41 degrees C / 105 degrees F
  Power
    1.0 V                       999 mV
    1.5 V                      1499 mV
    1.2 V                      1199 mV
    3.3 V                      3299 mV
    0.9 V                       900 mV
    2.5 V                      2500 mV
    3.3 V bias                 3339 mV
SIB 3 status:
  State                       Online
  Exhaust Temperature         40 degrees C / 104 degrees F
```

```
    Junction Temperature       45 degrees C / 113 degrees F
    Power
      1.0 V                     1000 mV
      1.5 V                     1500 mV
      1.2 V                     1199 mV
      3.3 V                     3299 mV
      0.9 V                      900 mV
      2.5 V                     2500 mV
      3.3 V bias                3328 mV
  SIB 4 status:
    State                      Online
    Exhaust Temperature        45 degrees C / 113 degrees F
    Junction Temperature       57 degrees C / 134 degrees F
    Power
      1.0 V                     1000 mV
      1.5 V                     1500 mV
      1.2 V                     1199 mV
      3.3 V                     3299 mV
      0.9 V                      900 mV
      2.5 V                     2499 mV
      3.3 V bias                3333 mV
  SIB 5 status:
    State                      Online
    Exhaust Temperature        43 degrees C / 109 degrees F
    Junction Temperature       71 degrees C / 159 degrees F
    Power
      1.0 V                     1000 mV
      1.5 V                     1499 mV
      1.2 V                     1199 mV
      3.3 V                     3300 mV
      0.9 V                      900 mV
      2.5 V                     2500 mV
      3.3 V bias                3307 mV
  SIB 6 status:
    State                      Online
    Exhaust Temperature        42 degrees C / 107 degrees F
    Junction Temperature       66 degrees C / 150 degrees F
    Power
      1.0 V                     1000 mV
      1.5 V                     1499 mV
      1.2 V                     1200 mV
      3.3 V                     3300 mV
      0.9 V                      899 mV
      2.5 V                     2500 mV
      3.3 V bias                3311 mV
  SIB 7 status:
    State                      Online
    Exhaust Temperature        42 degrees C / 107 degrees F
    Junction Temperature       67 degrees C / 152 degrees F
    Power
      1.0 V                      999 mV
      1.5 V                     1500 mV
      1.2 V                     1199 mV
      3.3 V                     3299 mV
      0.9 V                      900 mV
      2.5 V                     2499 mV
      3.3 V bias                3307 mV
  SIB 8 status:
    State                      Online
    Exhaust Temperature        43 degrees C / 109 degrees F
    Junction Temperature       71 degrees C / 159 degrees F
```



```
Power
  1.0 V                          1000 mV
  1.5 V                          1500 mV
  1.2 V                          1199 mV
  3.3 V                          3299 mV
  0.9 V                           900 mV
  2.5 V                          2500 mV
  3.3 V bias                     3332 mV
```

show chassis ethernet-switch

List of Syntax

Syntax

show chassis ethernet-switch
<errors <*port*>>

Syntax (EX8200 Switch)

show chassis ethernet-switch
<statistics <*port*> | switch <*number*>

Syntax (T4000 Router)

show chassis ethernet-switch
<errors <*port*> | statistics <*port*>>

Syntax (TX Matrix Router)

show chassis ethernet-switch
<errors <*port*> | statistics <*port*>>
<lcc <*number*> | scc>

Syntax (TX Matrix Plus Router)

show chassis ethernet-switch
<errors <*port*> | switch <*number*>
<lcc *number* | sfc *number*>
<statistics <*port*> | switch <*number*>

Syntax (MX Series Router)

show chassis ethernet-switch
<all-members>
<errors <*port*>>
<local>
<member *member-id*>

Syntax (MX2010 and MX2020 3D Universal Edge Routers)

show chassis ethernet-switch
<errors <*port*> | statistics <*port*>>
<old-rom-packet-count>

Syntax (PTX Series Packet Transport Routers)

show chassis ethernet-switch
<errors <*port*>>
<statistics <*port*>>
<port-state <*port*>>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.4 for EX Series switches.
sfc option introduced in Junos OS Release 9.6 for the TX Matrix Plus router.
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description (M10i, M40e, M120, M160, M320, MX Series, and T Series routers and EX8200 and PTX Series routers only) Display information about the ports on the Control Board (CB) Ethernet switch.

Options **none**—Display information about each connected port on the Ethernet switch. On a TX Matrix router, display information about each connected port on the Ethernet switch on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display information about each connected port on the Ethernet switch on the TX Matrix Plus router and its attached routers.

all-members—(MX Series routers only) (Optional) Display information about the ports on the CB Ethernet switch on all the members of the Virtual Chassis configuration.

errors—(Optional) Display the numbers and types of errors accumulated on all ports of the Ethernet switch.

errors *port*—(Optional) Display the numbers and types of errors accumulated on the specified port (0 through 15) of the Ethernet switch. On the TX Matrix router, replace ***port*** with a value from **0** through **15**. On the TX Matrix Plus router and EX8200 switch, replace ***port*** with a value from **0** through **27**. On the PTX Series Packet Transport Routers, replace ***port*** with a value from **0** through **25**. On the T4000 routers, MX2020 routers, and MX2010 routers, replace ***port*** with a value from **0** through **27**.

errors switch *number*—(TX Matrix Plus router only) (Optional) Display the numbers and types of errors accumulated on the specified switch. Replace ***number*** with a value from **0** through **2**.

lcc *number*—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display information about the ports on the CB Ethernet switch on the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display information about the ports on the CB Ethernet switch on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

old-rom-packet-count—(MX 2020 Routers only) (Optional) Display information about installed linecards. A non-zero number indicates that the bootrom on that linecard needs to be updated.

port-state—(PTX Series only) (Optional) Display information about current port operation (**Blocking**, **Listening**, or **Disabled**).

scc—(TX Matrix router only) (Optional) Display information about the ports on the CB's Ethernet switch on the TX Matrix router (switch-card chassis).

sfc ***number***—(TX Matrix Plus router only) (Optional) Display information about the ports on the CB's Ethernet switch on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with **0**.

statistics—(Optional) Display traffic statistics for each connected port on the Ethernet switch.

statistics ***port***—(Optional) Display traffic statistics for the specified port on the Ethernet switch. On the TX Matrix router, replace ***port*** with a value from **0** through **25**. On the TX Matrix Plus router or EX8200 switch, replace ***port*** with a value from **0** through **27**. On the PTX Series Packet Transport Routers, replace ***port*** with a value from **0** through **25**. On the T4000 routers, MX2020 routers, and MX2010 routers, replace ***port*** with a value from **0** through **27**.

statistics switch ***number***—(TX Matrix Plus routers and EX8200 switch only) (Optional) Display traffic statistics for the specified Ethernet switch number. On the TX Matrix Plus router and EX8216 switch, replace ***number*** with a value from **0** through **2**. On the EX8208 switch, replace ***number*** with a value from **0** through **1**.

Required Privilege Level

view

List of Sample Output

show chassis ethernet-switch on page 953
show chassis ethernet-switch (MX480 Router with MPC4E) on page 953
show chassis ethernet-switch (MX2010 Router) on page 954
show chassis ethernet-switch statistics (MX2010 Router) on page 956
show chassis ethernet-switch (MX2020 Router) on page 963
show chassis ethernet-switch statistics (MX2020 Router) on page 965
show chassis ethernet-switch (MX2020 Router with MPC4E) on page 973
show chassis ethernet-switch (TX Matrix Router) on page 974
show chassis ethernet-switch errors on page 976
show chassis ethernet-switch statistics on page 976
show chassis ethernet-switch errors (TX Matrix Plus Router) on page 977
show chassis ethernet-switch sfc errors (TX Matrix Plus Router) on page 978
show chassis ethernet-switch statistics (TX Matrix Plus Router) on page 979
show chassis ethernet-switch (T4000 Router) on page 983
show chassis ethernet-switch errors (T4000 Router) on page 984
show chassis ethernet-switch (PTX5000 Packet Transport Router) on page 985
show chassis ethernet-switch statistics (PTX5000 Packet Transport Router) on page 986

show chassis ethernet-switch port-state (PTX5000 Packet Transport Router) on page 989

Output Fields Table 65 on page 949 lists the output fields for the **show chassis ethernet-switch** command. Output fields are listed in the approximate order in which they appear.

Table 65: show chassis ethernet-switch Output Fields

Field Name	Field Description
Link is good on port n connected to device or **Link is good on Fast Ethernet port n connected to device** or **Link is good on Gigabit Ethernet port n connected to device** or **Link is down on Gigabit Ethernet port connected to device**	Information about the link between each port on the CB's Ethernet switch and one of the following devices: • FPC0 (Flexible PIC Concentrator 0) through FPC7 • Local controller • Routing Engine • Other Routing Engine (on a system with two Routing Engines) • SPMB (Switch Processor Mezzanine Board) • (TX Matrix router only) LCC0 (line-card chassis 0) through LCC3
Speed is	Speed at which the Ethernet link is running: **10 Mb** or **100 Mb.** When the device is **RE** or **Other RE** on the TX Matrix router, the speed is **1000 Mb**. NOTE: Irrespective of the device, the speed is **1000** Mb on the MX2010 and MX2020 routers.
Duplex is	Duplex type of the Ethernet link: **full** or **half**.
Autonegotiate is Enabled (or Disabled)	By default, built-in Fast Ethernet ports on a PIC autonegotiate whether to operate at 10 Mbps or 100 Mbps. All other interfaces automatically choose the correct speed based on the PIC type and whether the PIC is configured to operate in multiplexed mode (using the **no-concatenate** statement at the **[edit chassis]** hierarchy level, as described in the *Junos OS System Basics Configuration Guide*).
Flow Control TX is Enabled (or Disabled)	(MX2010 routers, MX2020 routers, and PTX Series) Flow control in the transmit direction is enabled (or disabled). Flow control regulates the flow of packets from the switch to the remote side of the connection.
Flow Control RX is Enabled (or Disabled)	(MX2010 routers, MX2020 routers, and PTX Series) Flow control in the receive direction is enabled (or disabled). Flow control regulates the flow of packets from the remote side of the connection to the switch.
MLT3	Number of multilevel threshold-3 (MLT-3) Fast Ethernet errors detected.
Accumulated error counts for port *n* connected to device FPC*n*: (error output only)	
Lock	Number of lock errors detected.
Xmit	Number of transmission errors detected.

Table 65: show chassis ethernet-switch Output Fields *(continued)*

Field Name	Field Description
ESD	Number of electrostatic discharge (ESD) errors detected.
False Carrier	Number of false carrier errors detected. This number is increased by one if a FRU is removed.
Disconnects	Number of disconnect errors detected.
FX mode	Number of errors detected on an Ethernet link over optical fiber.
Statistics for port *n* connected to device FPC*n* (statistics output only)	
TX Packets 64 Octets	(MX2010 and MX2020 routers) Number of packets of size 64 octets transmitted.
TX Packets 65 - 127 Octets	(MX2010 and MX2020 routers) Number of packets of size 65 through 127 octets transmitted.
TX Packets 128 - 255 Octets	(MX2010 and MX2020 routers) Number of packets of size 128 through 255 octets transmitted.
TX Packets 256 - 511 Octets	(MX2010 and MX2020 routers) Number of packets of size 256 through 511 octets transmitted.
TX Packets 512 - 1023 Octets	(MX2010 and MX2020 routers) Number of packets of size 512 through 1023 octets transmitted.
TX Packets 1024 - 1518 Octets	(MX2010 and MX2020 routers) Number of packets of size 1024 through 1518 octets transmitted.
TX Packets 1519 - 2047 Octets	(MX2010 and MX2020 routers) Number of packets of size 1519 through 2047 octets transmitted.
TX Packets 2048 - 4095 Octets	(MX2010 and MX2020 routers) Number of packets of size 2048 through 4095 octets transmitted.
TX Packets 4096 - 9216 Octets	(MX2010 and MX2020 routers) Number of packets of size 4096 through 9216 octets transmitted.
TX 1519 - 1522 Good Vlan frms	(MX2010 and MX2020 routers) Number of transmitted frames of size 1519 through 1522 octets that are good VLAN frames.
TX Octets	Number of octets sent.
TX Unicast packets	Number of unicast packets sent.
TX Multicast packets	Number of multicast packets sent.
TX Broadcast packets	Number of broadcast packets sent.
TX Single Collision frames	(MX2010 and MX2020 routers) Number of packets sent after one collision.

Table 65: show chassis ethernet-switch Output Fields *(continued)*

Field Name	Field Description
TX Mult. Collision frames	(MX2010 and MX2020 routers) Number of packets sent after multiple collisions.
TX Late collisions	Number of packets aborted during sending because of collisions after 64 bytes.
TX Excessive collisions	Number of packets not sent because of too many collisions.
TX Dropped packets	Number of transmitted packets that were dropped.
TX PAUSEMAC Ctrl Frames	Number of Media Access Control (MAC) frames containing PAUSE commands that were sent.
TX Oversize Packets	Number of oversize packets that were sent.
TX FCS Error Counter	Number of packets discarded because of frame check sequence errors.
TX Fragment Counter	Number of fragmented packets sent.
TX Byte Counter	Number of bytes sent.
TX Packet OK Counter	Number of viable packets sent.
TX Pause Packet Counter	Number of PAUSE packets sent.
RX Packets 64 Octets	(MX2010 and MX2020 routers) Number of packets of size 64 octets received.
RX Packets 65 - 127 Octets	(MX2010 and MX2020 routers) Number of packets of size 65 through 127 octets received.
RX Packets 128 - 255 Octets	(MX2010 and MX2020 routers) Number of packets of size 128 through 255 octets received.
RX Packets 256 - 511 Octets	(MX2010 and MX2020 routers) Number of packets of size 256 through 511 octets received.
RX Packets 512 - 1023 Octets	(MX2010 and MX2020 routers) Number of packets of size 512 through 1023 octets received.
RX Packets 1024 - 1518 Octets	(MX2010 and MX2020 routers) Number of packets of size 1024 through 1518 octets received.
RX Packets 1519 - 2047 Octets	(MX2010 and MX2020 routers) Number of packets of size 1519 through 2047 octets received.
RX Packets 2048 - 4095 Octets	(MX2010 and MX2020 routers) Number of packets of size 2048 through 4095 octets received.

Table 65: show chassis ethernet-switch Output Fields *(continued)*

Field Name	Field Description
RX Packets 4096 - 9216 Octets	(MX2010 and MX2020 routers) Number of packets of size 4096 through 9216 octets received.
RX Octets	Number of octets received.
RX Unicast packets	Number of unicast packets received.
RX Multicast packets	Number of multicast packets received.
RX Broadcast packets	Number of broadcast packets received.
RX FCS Errors	Number of packets discarded because of frame check sequence errors.
RX Alignment Errors	Number of incomplete octets received.
RX Dropped Packets	Number of incoming packets that were dropped.
RX Fragments	Number of fragmented packets received.
RX Symbol Errors	Number of symbols received that the router did not correctly decode.
RX MAC Control	Number of Media Access Control (MAC) packets received.
RX Oversize Packets	Number of oversize packets received.
RX Undersize Packets	Number of undersize packets received.
RX Jabbers	Total number of frames received that exceed the maximum byte count and contain CRC errors .
RX Control Frame Counter	Number of control frames received.
RX Pause Frame Counter	Number of pause frames received.
RX FCS Errors	Number of packets discarded because of frame check sequence errors.
RX Fragments	Number of fragmented packets received.
RX Byte Counter	Number of bytes received.
RX Packet OK Counter	Number of viable packets received.

Sample Output

show chassis ethernet-switch

```
user@host> show chassis ethernet-switch
Link is good on port 0 connected to device: FPC0
  Speed is 100 MB
  Duplex is full

Link is good on port 1 connected to device: FPC1
  Speed is 100 MB
  Duplex is full

Link is good on port 2 connected to device: FPC2
  Speed is 100 MB
  Duplex is full

Link is good on port 3 connected to device: FPC3
  Speed is 100 MBb
  Duplex is full

Link is good on port 7 connected to device: Local controller
  Speed is 100 MB
  Duplex is full

Link is good on port 9 connected to device: SPMB
  Speed is 100 MB
  Duplex is full

Link is good on port 13 connected to device: FPC5
  Speed is 100 MB
  Duplex is full
```

show chassis ethernet-switch (MX480 Router with MPC4E)

```
user@host > show chassis ethernet-switch
Displaying summary for switch 0
Link is down on GE port 0 connected to device: FPC0

Link is down on GE port 1 connected to device: FPC1

Link is good on GE port 2 connected to device: FPC2
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 3 connected to device: FPC3
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 4 connected to device: FPC4
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
```

```
  Flow Control RX is Disabled

Link is down on GE port 5 connected to device: FPC5

Link is down on GE port 6 connected to device: FPC6

Link is down on GE port 7 connected to device: FPC7

Link is down on GE port 8 connected to device: FPC8

Link is down on GE port 9 connected to device: FPC9

Link is down on GE port 10 connected to device: FPC10

Link is down on GE port 11 connected to device: FPC11

Link is good on GE port 12 connected to device: Other RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 13 connected to device: RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 14 connected to device: Debug-GigE
```

show chassis ethernet-switch (MX2010 Router)

```
user@host > show chassis ethernet-switch
Displaying summary for switch 0
Link is good on GE port 0 connected to device: FPC0
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 1 connected to device: FPC1
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 2 connected to device: FPC3
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 3 connected to device: FPC2
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
```



```
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 4 connected to device: FPC5
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 5 connected to device: FPC4
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 6 connected to device: FPC6
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 7 connected to device: FPC7
  Speed is 1000Mb
Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 8 connected to device: FPC8
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 9 connected to device: FPC9
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 20 connected to device: Other RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 21 connected to device: RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 22 connected to device: Debug-GigE
```



```
Link is good on GE port 23 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on XE port 24 connected to device: SFP+ 0

Link is down on XE port 25 connected to device: SFP+ 1

Link is down on XE port 26 connected to device: RE-10GigE

Link is down on XE port 27 connected to device: Other RE-10GigE
```

show chassis ethernet-switch statistics (MX2010 Router)

```
user@host > show chassis ethernet-switch statistics
Displaying port statistics for switch 0
Statistics for port 0 connected to device FPC0:
  TX Packets 64 Octets        5088623
  TX Packets 65-127 Octets    2637257
  TX Packets 128-255 Octets   84829
  TX Packets 256-511 Octets   120193
  TX Packets 512-1023 Octets  252371
  TX Packets 1024-1518 Octets  7189736
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   15373009
  TX Multicast Packets        14
  TX Broadcast Packets        1679654
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             3041239292
  RX Packets 64 Octets        874260
  RX Packets 65-127 Octets    26066124
  RX Packets 128-255 Octets   1386532
  RX Packets 256-511 Octets   150539
  RX Packets 512-1023 Octets  4636799
  RX Packets 1024-1518 Octets  92601
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   33206855
  RX Multicast Packets        0
  RX Broadcast Packets        279416
  RX FCS Errors               0
  RX Align Errors             0
```



```
    RX Fragments              0
    RX Symbol errors          0
    RX Unsupported opcodes    0
    RX Out of Range Length    0
    RX False Carrier Errors   0
    RX Undersize Packets      0
    RX Oversize Packets       0
    RX Jabbers                0
    RX 1519-1522 Good Vlan frms 0
    RX MTU Exceed Counter     0
    RX Control Frame Counter  0
    RX Pause Frame Counter    0
    RX Byte Counter           958929187
  Statistics for port 1 connected to device FPC1:
    TX Packets 64 Octets      5109146
    TX Packets 65-127 Octets  2779473
    TX Packets 128-255 Octets 2441286
    TX Packets 256-511 Octets 173102
    TX Packets 512-1023 Octets 1547504
    TX Packets 1024-1518 Octets 7190581
    TX Packets 1519-2047 Octets 0
    TX Packets 2048-4095 Octets 0
    TX Packets 4096-9216 Octets 0
    TX 1519-1522 Good Vlan frms 0
    TX Octets                 19241092
    TX Multicast Packets      14
    TX Broadcast Packets      1673369
    TX Single Collision frames 0
    TX Mult. Collision frames 0
    TX Late Collisions        0
    TX Excessive Collisions   0
    TX Collision frames       0
    TX PAUSEMAC Ctrl Frames   0
    TX MAC ctrl frames        0
    TX Frame deferred Xmns    0
    TX Frame excessive deferl 0
    TX Oversize Packets       0
    TX Jabbers                0
    TX FCS Error Counter      0
    TX Fragment Counter       0
    TX Byte Counter           4213380187
    RX Packets 64 Octets      865914
    RX Packets 65-127 Octets  26612151
    RX Packets 128-255 Octets 1090153
    RX Packets 256-511 Octets 25126
    RX Packets 512-1023 Octets 101158
    RX Packets 1024-1518 Octets 78092
    RX Packets 1519-2047 Octets 0
    RX Packets 2048-4095 Octets 0
    RX Packets 4096-9216 Octets 0
    RX Octets                 28772594
    RX Multicast Packets      0
    RX Broadcast Packets      285669
    RX FCS Errors             0
    RX Align Errors           0
    RX Fragments              0
    RX Symbol errors          0
    RX Unsupported opcodes    0
    RX Out of Range Length    0
    RX False Carrier Errors   0
    RX Undersize Packets      0
```



```
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             2327283837

Link is down on GE port 2 connected to device: FPC3

Link is down on GE port 3 connected to device: FPC2

Link is down on GE port 4 connected to device: FPC5

Link is down on GE port 5 connected to device: FPC4

Link is down on GE port 6 connected to device: FPC6

Link is down on GE port 7 connected to device: FPC7

Statistics for port 8 connected to device FPC8:
  TX Packets 64 Octets        5341094
  TX Packets 65-127 Octets    2625310
  TX Packets 128-255 Octets   3315158
  TX Packets 256-511 Octets   174805
  TX Packets 512-1023 Octets  976908
  TX Packets 1024-1518 Octets  7181498
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   19614773
  TX Multicast Packets        14
  TX Broadcast Packets        1673831
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             3946762991
  RX Packets 64 Octets        955509
  RX Packets 65-127 Octets    27568588
  RX Packets 128-255 Octets   1460936
  RX Packets 256-511 Octets   153248
  RX Packets 512-1023 Octets  2856206
  RX Packets 1024-1518 Octets  76419
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   33070906
  RX Multicast Packets        0
  RX Broadcast Packets        285183
  RX FCS Errors               0
```

```
  RX Align Errors            0
  RX Fragments               0
  RX Symbol errors           0
  RX Unsupported opcodes     0
  RX Out of Range Length     0
  RX False Carrier Errors    0
  RX Undersize Packets       0
  RX Oversize Packets        0
  RX Jabbers                 0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter      0
  RX Control Frame Counter   0
  RX Pause Frame Counter     0
  RX Byte Counter            4256093824

Statistics for port 9 connected to device FPC9:
  TX Packets 64 Octets       5237213
  TX Packets 65-127 Octets   3268775
  TX Packets 128-255 Octets  2320476
  TX Packets 256-511 Octets  1789844
  TX Packets 512-1023 Octets 501022
  TX Packets 1024-1518 Octets  7800455
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                  20917785
  TX Multicast Packets       14
  TX Broadcast Packets       1673368
  TX Single Collision frames 0
  TX Mult. Collision frames  0
  TX Late Collisions         0
  TX Excessive Collisions    0
  TX Collision frames        0
  TX PAUSEMAC Ctrl Frames    0
  TX MAC ctrl frames         0
  TX Frame deferred Xmns     0
  TX Frame excessive deferl  0
  TX Oversize Packets        0
  TX Jabbers                 0
  TX FCS Error Counter       0
  TX Fragment Counter        0
  TX Byte Counter            747012161
  RX Packets 64 Octets       1036527
  RX Packets 65-127 Octets   27590367
  RX Packets 128-255 Octets  1590059
  RX Packets 256-511 Octets  328257
  RX Packets 512-1023 Octets 75975
  RX Packets 1024-1518 Octets  73556
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                  30694741
  RX Multicast Packets       0
  RX Broadcast Packets       285586
  RX FCS Errors              0
  RX Align Errors            0
  RX Fragments               0
  RX Symbol errors           0
  RX Unsupported opcodes     0
  RX Out of Range Length     0
```



```
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             2727836941

Statistics for port 20 connected to device Other RE-GigE:
  TX Packets 64 Octets        1682540
  TX Packets 65-127 Octets    3454
  TX Packets 128-255 Octets   659
  TX Packets 256-511 Octets   0
  TX Packets 512-1023 Octets  1
  TX Packets 1024-1518 Octets  0
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   1686654
  TX Multicast Packets        6
  TX Broadcast Packets        1673798
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             108042476
  RX Packets 64 Octets        710214
  RX Packets 65-127 Octets    35785510
  RX Packets 128-255 Octets   4616
  RX Packets 256-511 Octets   232
  RX Packets 512-1023 Octets  565
  RX Packets 1024-1518 Octets  28798
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   36529935
  RX Multicast Packets        8
  RX Broadcast Packets        285546
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
```



```
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             2676440958

Statistics for port 21 connected to device RE-GigE:
  TX Packets 64 Octets        4805310
  TX Packets 65-127 Octets    143798628
  TX Packets 128-255 Octets   5532385
  TX Packets 256-511 Octets   671059
  TX Packets 512-1023 Octets  7684123
  TX Packets 1024-1518 Octets  344021
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   162835526
  TX Multicast Packets        8
  TX Broadcast Packets        1673409
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             105857355
  RX Packets 64 Octets        14537137
  RX Packets 65-127 Octets    11445505
  RX Packets 128-255 Octets   8161767
  RX Packets 256-511 Octets   2257944
  RX Packets 512-1023 Octets  3277807
  RX Packets 1024-1518 Octets  29373209
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   69053369
  RX Multicast Packets        6
  RX Broadcast Packets        285935
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             2980410755
```

```
Link is down on GE port 22 connected to device: Debug-GigE
Statistics for port 23 connected to device SPMB:
  TX Packets 64 Octets        1885878
  TX Packets 65-127 Octets    138845
  TX Packets 128-255 Octets   18
  TX Packets 256-511 Octets   1
  TX Packets 512-1023 Octets  2
  TX Packets 1024-1518 Octets  16391
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   2041135
  TX Multicast Packets        14
  TX Broadcast Packets        1707267
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             148066476
  RX Packets 64 Octets        374994
  RX Packets 65-127 Octets    183398
  RX Packets 128-255 Octets   749
  RX Packets 256-511 Octets   13658
  RX Packets 512-1023 Octets  13421
  RX Packets 1024-1518 Octets  9
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   586229
  RX Multicast Packets        0
  RX Broadcast Packets        252034
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             51431942

Link is down on XE port 24 connected to device: SFP+ 0

Link is down on XE port 25 connected to device: SFP+ 1
```



```
Link is down on XE port 26 connected to device: RE-10GigE

Link is down on XE port 27 connected to device: Other RE-10GigE
```

show chassis ethernet-switch (MX2020 Router)

```
user@host > show chassis ethernet-switch
Displaying summary for switch 0
Link is good on GE port 0 connected to device: FPC0
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 1 connected to device: FPC1
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 2 connected to device: FPC3
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 3 connected to device: FPC2
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 4 connected to device: FPC5
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 5 connected to device: FPC4
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 6 connected to device: FPC6
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 7 connected to device: FPC7
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
```



```
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 8 connected to device: FPC8
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 9 connected to device: FPC9
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 10 connected to device: FPC10
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 11 connected to device: FPC11
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 12 connected to device: FPC13
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 13 connected to device: FPC12
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 14 connected to device: FPC14
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 15 connected to device: FPC15
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 16 connected to device: FPC17
  Speed is 1000Mb
```



```
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 17 connected to device: FPC16
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 18 connected to device: FPC18
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 19 connected to device: FPC19
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 20 connected to device: Other RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 21 connected to device: RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 22 connected to device: Debug-GigE

Link is good on GE port 23 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on XE port 24 connected to device: SFP+ 0

Link is down on XE port 25 connected to device: SFP+ 1

Link is down on XE port 26 connected to device: RE-10GigE

Link is down on XE port 27 connected to device: Other RE-10GigE
```

show chassis ethernet-switch statistics (MX2020 Router)

`user@host >` **show chassis ethernet-switch statistics**

```
Displaying port statistics for switch 0
Statistics for port 0 connected to device FPC0:
  TX Packets 64 Octets        1468564
  TX Packets 65-127 Octets    153896
  TX Packets 128-255 Octets   237
  TX Packets 256-511 Octets   286
  TX Packets 512-1023 Octets  599
  TX Packets 1024-1518 Octets  22803
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   1646385
  TX Multicast Packets        6
  TX Broadcast Packets        970939
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             130470290
  RX Packets 64 Octets        180266
  RX Packets 65-127 Octets    519030
  RX Packets 128-255 Octets   1390
  RX Packets 256-511 Octets   42857
  RX Packets 512-1023 Octets  3482
  RX Packets 1024-1518 Octets  8147
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   755172
  RX Multicast Packets        0
  RX Broadcast Packets        42822
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             75374021
Statistics for port 1 connected to device FPC1:
  TX Packets 64 Octets        1493739
  TX Packets 65-127 Octets    126996
  TX Packets 128-255 Octets   241
  TX Packets 256-511 Octets   283
```



```
  TX Packets 512-1023 Octets  604
  TX Packets 1024-1518 Octets  33687
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   1655550
  TX Multicast Packets        6
  TX Broadcast Packets        969032
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             141832690
  RX Packets 64 Octets        155655
  RX Packets 65-127 Octets    545561
  RX Packets 128-255 Octets   1394
  RX Packets 256-511 Octets   42811
  RX Packets 512-1023 Octets  3514
  RX Packets 1024-1518 Octets  8171
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   757106
  RX Multicast Packets        0
  RX Broadcast Packets        44509
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             75691392
Statistics for port 2 connected to device FPC3:
  TX Packets 64 Octets        1465749
  TX Packets 65-127 Octets    152849
  TX Packets 128-255 Octets   238
  TX Packets 256-511 Octets   289
  TX Packets 512-1023 Octets  602
  TX Packets 1024-1518 Octets  38903
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
```

```
  TX Octets                   1658630
  TX Multicast Packets        6
  TX Broadcast Packets        968873
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             147427010
  RX Packets 64 Octets        181636
  RX Packets 65-127 Octets    517526
  RX Packets 128-255 Octets   1405
  RX Packets 256-511 Octets   42806
  RX Packets 512-1023 Octets  3515
  RX Packets 1024-1518 Octets  8168
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   755056
  RX Multicast Packets        0
  RX Broadcast Packets        44490
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             75381869
Statistics for port 3 connected to device FPC2:
  TX Packets 64 Octets        1473828
  TX Packets 65-127 Octets    145643
  TX Packets 128-255 Octets   253
  TX Packets 256-511 Octets   285
  TX Packets 512-1023 Octets  612
  TX Packets 1024-1518 Octets  26603
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   1647224
  TX Multicast Packets        6
  TX Broadcast Packets        968925
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
```



```
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             134293832
  RX Packets 64 Octets        174230
  RX Packets 65-127 Octets    525756
  RX Packets 128-255 Octets   1404
  RX Packets 256-511 Octets   42815
  RX Packets 512-1023 Octets  3530
  RX Packets 1024-1518 Octets  8176
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   755911
  RX Multicast Packets        0
  RX Broadcast Packets        44499
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             75517355
Statistics for port 4 connected to device FPC5:
  TX Packets 64 Octets        1466664
  TX Packets 65-127 Octets    151155
  TX Packets 128-255 Octets   238
  TX Packets 256-511 Octets   277
  TX Packets 512-1023 Octets  615
  TX Packets 1024-1518 Octets  54674
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   1673623
  TX Multicast Packets        6
  TX Broadcast Packets        968610
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
```

```
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             164247790
  RX Packets 64 Octets        180006
  RX Packets 65-127 Octets    518217
  RX Packets 128-255 Octets   1406
  RX Packets 256-511 Octets   42787
  RX Packets 512-1023 Octets  3515
  RX Packets 1024-1518 Octets  8164
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   754095
  RX Multicast Packets        0
  RX Broadcast Packets        44457
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             75311970
Statistics for port 5 connected to device FPC4:
  TX Packets 64 Octets        1464770
  TX Packets 65-127 Octets    154498
  TX Packets 128-255 Octets   225
  TX Packets 256-511 Octets   280
  TX Packets 512-1023 Octets  637
  TX Packets 1024-1518 Octets  26355
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   1646765
  TX Multicast Packets        6
  TX Broadcast Packets        968730
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             134058606
  RX Packets 64 Octets        169269
```



```
  RX Packets 65-127 Octets    515285
  RX Packets 128-255 Octets   1527
  RX Packets 256-511 Octets   42804
  RX Packets 512-1023 Octets  3521
  RX Packets 1024-1518 Octets  9142
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   741548
  RX Multicast Packets        0
  RX Broadcast Packets        44470
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             75498393
Statistics for port 6 connected to device FPC6:
  TX Packets 64 Octets        1475260
  TX Packets 65-127 Octets    143324
  TX Packets 128-255 Octets   260
  TX Packets 256-511 Octets   274
  TX Packets 512-1023 Octets  603
  TX Packets 1024-1518 Octets  40631
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   1660352
  TX Multicast Packets        6
  TX Broadcast Packets        968466
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             149212764
  RX Packets 64 Octets        172275
  RX Packets 65-127 Octets    526519
  RX Packets 128-255 Octets   1394
  RX Packets 256-511 Octets   42777
  RX Packets 512-1023 Octets  3514
  RX Packets 1024-1518 Octets  8161
  RX Packets 1519-2047 Octets  0
```

```
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   754640
  RX Multicast Packets        0
  RX Broadcast Packets        44443
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             75386517
Statistics for port 7 connected to device FPC7:
  TX Packets 64 Octets        1472361
  TX Packets 65-127 Octets    145646
  TX Packets 128-255 Octets   251
  TX Packets 256-511 Octets   250
  TX Packets 512-1023 Octets  580
  TX Packets 1024-1518 Octets  49530
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   1668618
  TX Multicast Packets        6
  TX Broadcast Packets        968317
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             158689814
  RX Packets 64 Octets        174618
  RX Packets 65-127 Octets    523421
  RX Packets 128-255 Octets   1393
  RX Packets 256-511 Octets   42764
  RX Packets 512-1023 Octets  3514
  RX Packets 1024-1518 Octets  8158
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   753868
  RX Multicast Packets        0
  RX Broadcast Packets        44429
  RX FCS Errors               0
```



```
  RX Align Errors            0
  RX Fragments               0
  RX Symbol errors           0
  RX Unsupported opcodes     0
  RX Out of Range Length     0
  RX False Carrier Errors    0
  RX Undersize Packets       0
  RX Oversize Packets        0
  RX Jabbers                 0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter      0
  RX Control Frame Counter   0
  RX Pause Frame Counter     0
  RX Byte Counter            75309863
Statistics for port 8 connected to device FPC8:
...
```

show chassis ethernet-switch (MX2020 Router with MPC4E)

```
user@ host > show chassis ethernet-switch
Displaying summary for switch 0
Link is good on GE port 0 connected to device: FPC0
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 1 connected to device: FPC1

Link is down on GE port 2 connected to device: FPC3

Link is down on GE port 3 connected to device: FPC2

Link is down on GE port 4 connected to device: FPC5

Link is down on GE port 5 connected to device: FPC4

Link is down on GE port 6 connected to device: FPC6

Link is down on GE port 7 connected to device: FPC7

Link is down on GE port 8 connected to device: FPC8

Link is good on GE port 9 connected to device: FPC9
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 10 connected to device: FPC10
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 11 connected to device: FPC11

Link is down on GE port 12 connected to device: FPC13
```

```
Link is down on GE port 13 connected to device: FPC12

Link is good on GE port 14 connected to device: FPC14
  Speed is 1000Mb
  Duplex is full
Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 15 connected to device: FPC15

Link is down on GE port 16 connected to device: FPC17

Link is down on GE port 17 connected to device: FPC16

Link is down on GE port 18 connected to device: FPC18

Link is good on GE port 19 connected to device: FPC19
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 20 connected to device: Other RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 21 connected to device: RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 22 connected to device: Debug-GigE

Link is good on GE port 23 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on XE port 24 connected to device: SFP+ 0

Link is down on XE port 25 connected to device: SFP+ 1

Link is down on XE port 26 connected to device: RE-10GigE

Link is down on XE port 27 connected to device: Other RE-10GigE
```

show chassis ethernet-switch (TX Matrix Router)

```
user@host> show chassis ethernet-switch
scc-re0:
--------------------------------------------------------------------------
```



```
Link is good on FE port 4 connected to device: LCC0
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 6 connected to device: LCC2
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 8 connected to device: SPMB
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

lcc0-re0:
--------------------------------------------------------------------------
Link is good on FE port 1 connected to device: FPC1
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 2 connected to device: FPC2
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 8 connected to device: SPMB
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 10 connected to device: SCC
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

lcc2-re0:
--------------------------------------------------------------------------
Link is good on FE port 0 connected to device: FPC0
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 1 connected to device: FPC1
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 2 connected to device: FPC2
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 8 connected to device: SPMB
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 10 connected to device: SCC
  Speed is 100 MB
```



```
  Duplex is full
  Autonegotiate is Enabled
```

show chassis ethernet-switch errors

```
user@host> show chassis ethernet-switch errors
Accumulated error counts for port 0 connected to device FPC0:
  MLT3           2
  Lock           0
  Xmit           0
  ESD            0
  False carrier  2
  Disconnects    0
  FX mode        0
Accumulated error counts for port 1 connected to device FPC1:
  MLT3           2
  Lock           0
  Xmit           0
  ESD            0
  False carrier  2
  Disconnects    0
  FX mode        0
Accumulated error counts for port 2 connected to device FPC2:
  MLT3           2
  Lock           0
  Xmit           0
  ESD            0
  False carrier  3
  Disconnects    0
  FX mode        0
Accumulated error counts for port 3 connected to device FPC3:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
Accumulated error counts for port 4 connected to device Nothing:
   MLT3           0
   Lock           0
   Xmit           0
   ESD            0
   False carrier  0
   Disconnects    0
   FX mode        0
...
```

show chassis ethernet-switch statistics

```
user@host> show chassis ethernet-switch statistics
Statistics for port 0 connected to device FPC0:
   TX Unicast packets            68113
   TX Multicast packets          0
   TX Broadcast packets          20851
   TX Late collisions            0
   TX Excessive collisions       0
   TX Dropped packets            0

   RX Unicast packets            67410
   RX Multicast packets          0
   RX Broadcast packets          20852
```



```
   RX FCS Errors               0
   RX Alignment Errors         0
   RX Dropped Packets          0
   RX Fragments                0
   RX Symbol Errors            0

Statistics for port 1 connected to device FPC1:
   TX Unicast packets          66496
   TX Multicast packets        0
   TX Broadcast packets        20080
   TX Late collisions          0
   TX Excessive collisions     0
   TX Dropped packets          0

   RX Unicast packets          66037
   RX Multicast packets        0
   RX Broadcast packets        20080
   RX FCS Errors               0
   RX Alignment Errors         0
   RX Dropped Packets          0
   RX Fragments                0
   RX Symbol Errors            0

Statistics for port 2 connected to device FPC2:
   TX Unicast packets          64206
   TX Multicast packets        0
   TX Broadcast packets        21183
   TX Late collisions          0
   TX Excessive collisions     0
   TX Dropped packets          0

   RX Unicast packets          63671
   RX Multicast packets        0
   RX Broadcast packets        21183
   RX FCS Errors               0
   RX Alignment Errors         0
   RX Dropped Packets          0
   RX Fragments                0
   RX Symbol Errors            0
Statistics for port 3 connected to device FPC3:
...
```

show chassis ethernet-switch errors (TX Matrix Plus Router)

```
user@host> show chassis ethernet-switch errors
sfc0-re0:
--------------------------------------------------------------------------
Displaying error for switch 0

Displaying error for switch 1
Accumulated error counts for port 0 connected to device LCC0:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0

lcc0-re0:
--------------------------------------------------------------------------
```

```
Displaying error for switch 0
Accumulated error counts for port 6 connected to device FPC0:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  5
  Disconnects    0
  FX mode        0
Accumulated error counts for port 7 connected to device FPC1:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  7
  Disconnects    0
  FX mode        0
Accumulated error counts for port 19 connected to device Other RE:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
Accumulated error counts for port 20 connected to device SFC0:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
```

show chassis ethernet-switch sfc errors (TX Matrix Plus Router)

```
user@host> show chassis ethernet-switch errors switch sfc
sfc0-re0:
--------------------------------------------------------------------------
Displaying error for switch 1
Accumulated error counts for port 0 connected to device LCC0:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
Accumulated error counts for port 2 connected to device LCC1:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
Accumulated error counts for port 4 connected to device LCC2:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
```



```
  False carrier  0
  Disconnects    0
  FX mode        0
Accumulated error counts for port 6 connected to device LCC3:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0

lcc0-re0:
--------------------------------------------------------------------------
error: command is not valid on the t1600

lcc1-re0:
--------------------------------------------------------------------------
error: command is not valid on the t1600

lcc2-re0:
--------------------------------------------------------------------------
error: command is not valid on the t1600

lcc3-re0:
--------------------------------------------------------------------------
error: command is not valid on the t1600
```

show chassis ethernet-switch statistics (TX Matrix Plus Router)

```
user@host> show chassis ethernet-switch statistics
sfc0-re0:
--------------------------------------------------------------------------
Displaying port statistics for switch 0
Statistics for port 1 connected to device 1GSW:
  TX Packets 64 Octets         5183577
  TX Packets 65-127 Octets     67820
  TX Packets 128-255 Octets    772
  TX Packets 256-511 Octets    136
  TX Packets 512-1023 Octets   68
  TX Packets 1024-1518 Octets   10881
  TX Packets 1519-2047 Octets   0
  TX Packets 2048-4095 Octets   0
  TX Packets 4096-9216 Octets   0
  TX Packets 9217-16383 Octets   0
  TX Octets                    5263254
  TX Multicast Packets         16
  TX Broadcast Packets         723403
  TX PAUSEMAC Ctrl Frames      0
  TX Oversize Packets          0
  TX FCS Error Counter         0
  TX Fragment Counter          0
  TX Byte Counter              349922253
  TX Packet OK Counter         5263254
  TX Pause Packet Counter      0
  TX Unicast Counter           4539835
  RX Packets 64 Octets         6513629
  RX Packets 65-127 Octets     88761
  RX Packets 128-255 Octets    6382
  RX Packets 256-511 Octets    22027
  RX Packets 512-1023 Octets   4319
```

```
  RX Packets 1024-1518 Octets  49922
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Packets 9217-16383 Octets  0
  RX Octets                   6685040
  RX Multicast Packets        4
  RX Broadcast Packets        2137376
  RX FCS Errors               0
  RX Fragments                0
  RX MAC Control Packets      0
  RX Out of Range Length      0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             509224602
  RX Unicast Frame Count      4547660
  RX Packet OK Count          6685040
Statistics for port 9 connected to device RE1:
  TX Packets 64 Octets        2500318
  TX Packets 65-127 Octets    443
  TX Packets 128-255 Octets   0
  TX Packets 256-511 Octets   0
  TX Packets 512-1023 Octets  0
  TX Packets 1024-1518 Octets  0
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX Packets 9217-16383 Octets  0
  TX Octets                   2500761
  TX Multicast Packets        4
  TX Broadcast Packets        2500757
  TX PAUSEMAC Ctrl Frames     0
  TX Oversize Packets         0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             160049670
  TX Packet OK Counter        0
  TX Pause Packet Counter     0
  TX Unicast Counter          0
  RX Packets 64 Octets        701191
  RX Packets 65-127 Octets    5882
  RX Packets 128-255 Octets   2
  RX Packets 256-511 Octets   0
  RX Packets 512-1023 Octets  17965
  RX Packets 1024-1518 Octets  7
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Packets 9217-16383 Octets  0
  RX Octets                   725047
  RX Multicast Packets        8
  RX Broadcast Packets        2500757
  RX FCS Errors               0
  RX Fragments                0
  RX MAC Control Packets      0
  RX Out of Range Length      0
  RX Undersize Packets        0
  RX Oversize Packets         0
```

```
  RX Jabbers                0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             62402656
  RX Unicast Frame Count      0
  RX Packet OK Count          0
Statistics for port 17 connected to device RE0:
  TX Packets 64 Octets        7214818
  TX Packets 65-127 Octets    94640
  TX Packets 128-255 Octets   6384
  TX Packets 256-511 Octets   22027
  TX Packets 512-1023 Octets  22284
  TX Packets 1024-1518 Octets  49929
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX Packets 9217-16383 Octets  0
  TX Octets                   7410082
  TX Multicast Packets        12
  TX Broadcast Packets        2497247
  TX PAUSEMAC Ctrl Frames     0
  TX Oversize Packets         0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             571626932
  TX Packet OK Counter        0
  TX Pause Packet Counter     0
  TX Unicast Counter          0
  RX Packets 64 Octets        4823701
  RX Packets 65-127 Octets    67812
  RX Packets 128-255 Octets   772
  RX Packets 256-511 Octets   136
  RX Packets 512-1023 Octets  68
  RX Packets 1024-1518 Octets  10881
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Packets 9217-16383 Octets  0
  RX Octets                   4903370
  RX Multicast Packets        8
  RX Broadcast Packets        2497247
  RX FCS Errors               0
  RX Fragments                0
  RX MAC Control Packets      0
  RX Out of Range Length      0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             326889517
  RX Unicast Frame Count      0
  RX Packet OK Count          0

Displaying port statistics for switch 1
Statistics for port 0 connected to device LCC0:
  TX Packets 64 Octets        5053443
  TX Packets 65-127 Octets    59737
  TX Packets 128-255 Octets   768
  TX Packets 256-511 Octets   87
  TX Packets 512-1023 Octets  68
```

```
  TX Packets 1024-1518 Octets  85
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   5114188
  TX Multicast Packets        16
  TX Broadcast Packets        1125742
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             329291449
  RX Packets 64 Octets        5640175
  RX Packets 65-127 Octets    79875
  RX Packets 128-255 Octets   6338
  RX Packets 256-511 Octets   165
  RX Packets 512-1023 Octets  4317
  RX Packets 1024-1518 Octets  10
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   5730880
  RX Multicast Packets        4
  RX Broadcast Packets        1735007
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
RX Pause Frame Counter      0
  RX Byte Counter             371282850
Statistics for port 18 connected to device SPMB:
  TX Packets 64 Octets        2990326
  TX Packets 65-127 Octets    8572
  TX Packets 128-255 Octets   4
  TX Packets 256-511 Octets   49
  TX Packets 512-1023 Octets  0
  TX Packets 1024-1518 Octets  10793
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   3009744
```



```
  TX Multicast Packets        20
  TX Broadcast Packets        2458322
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             203712524
  RX Packets 64 Octets        873454
  RX Packets 65-127 Octets    8886
  RX Packets 128-255 Octets   44
  RX Packets 256-511 Octets   21862
  RX Packets 512-1023 Octets  2
  RX Packets 1024-1518 Octets  49912
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   954160
  RX Multicast Packets        0
  RX Broadcast Packets        402369
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             137941752
...
```

show chassis ethernet-switch (T4000 Router)

```
user@host> show chassis ethernet-switch
Displaying summary for switch 0
Link is good on GE port 6 connected to device: FPC0
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 04

Link is good on GE port 9 connected to device: FPC3
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03
```

```
Link is good on GE port 11 connected to device: FPC5
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 12 connected to device: FPC6
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 14 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on GE port 18 connected to device: RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled

Link is good on GE port 19 connected to device: Other RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
```

show chassis ethernet-switch errors (T4000 Router)

```
user@host> show chassis ethernet-switch errors

Displaying error for switch 0
Accumulated error counts for port 6 connected to device FPC0:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  4
  Disconnects    0
  FX mode        0
Accumulated error counts for port 9 connected to device FPC3:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  3
  Disconnects    0
  FX mode        0
Accumulated error counts for port 11 connected to device FPC5:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  3
  Disconnects    0
  FX mode        0
Accumulated error counts for port 12 connected to device FPC6:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
```



```
  False carrier  3
  Disconnects    0
  FX mode        0
Accumulated error counts for port 19 connected to device Other RE:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
```

show chassis ethernet-switch (PTX5000 Packet Transport Router)

```
user@host> show chassis ethernet-switch
Displaying summary for switch 0
Link is good on XE port 2 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on XE port 11 connected to device: FPC7
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on XE port 12 connected to device: FPC6
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on XE port 13 connected to device: FPC5
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on XE port 15 connected to device: FPC3
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on XE port 16 connected to device: FPC2
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on XE port 18 connected to device: FPC0
  Speed is 1000Mb
  Duplex is full
```



```
  Autonegotiate is Disabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on XE port 19 connected to device: OTHER RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on XE port 20 connected to device: RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled
```

show chassis ethernet-switch statistics (PTX5000 Packet Transport Router)

```
user@host> show chassis ethernet-switch statistics
Displaying port statistics for switch 0
Statistics for port 2 connected to device SPMB:
  TX Packets 64 Octets         10942
  TX Packets 65-127 Octets     843
  TX Packets 128-255 Octets    2
  TX Packets 256-511 Octets    2
  TX Packets 512-1023 Octets   0
  TX Packets 1024-1518 Octets   6862
  TX Packets 1519-2047 Octets   0
  TX Packets 2048-4095 Octets   0
  TX Packets 4096-9216 Octets   0
  TX Packets 9217-16383 Octets   0
  TX Octets                    18651
  TX Multicast Packets         6
  TX Broadcast Packets         10331
  TX PAUSEMAC Ctrl Frames      0
  TX Oversize Packets          0
  TX FCS Error Counter         0
  TX Fragment Counter          0
  TX Byte Counter              8105166
  TX Packet OK Counter         0
  TX Pause Packet Counter      0
  TX Unicast Counter           0
  RX Packets 64 Octets         8679
  RX Packets 65-127 Octets     2364
  RX Packets 128-255 Octets    531
  RX Packets 256-511 Octets    112
  RX Packets 512-1023 Octets   26
  RX Packets 1024-1518 Octets   8
  RX Packets 1519-2047 Octets   0
  RX Packets 2048-4095 Octets   0
  RX Packets 4096-9216 Octets   0
  RX Packets 9217-16383 Octets   0
  RX Octets                    11720
  RX Multicast Packets         0
  RX Broadcast Packets         10331
  RX FCS Errors                0
  RX Fragments                 0
  RX MAC Control Packets       0
  RX Out of Range Length       0
```



```
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             938105
  RX Unicast Frame Count      0
  RX Packet OK Count          0
Statistics for port 11 connected to device FPC7:
  TX Packets 64 Octets        14492
  TX Packets 65-127 Octets    3542
  TX Packets 128-255 Octets   6
  TX Packets 256-511 Octets   45
  TX Packets 512-1023 Octets  60

Continued...

Statistics for port 18 connected to device FPC0:
  TX Packets 64 Octets        15212
  TX Packets 65-127 Octets    3810
  TX Packets 128-255 Octets   6
  TX Packets 256-511 Octets   43
  TX Packets 512-1023 Octets  66
  TX Packets 1024-1518 Octets  169
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX Packets 9217-16383 Octets  0
  TX Octets                   19306
  TX Multicast Packets        0
  TX Broadcast Packets        10886
  TX PAUSEMAC Ctrl Frames     0
  TX Oversize Packets         0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             1569412
  TX Packet OK Counter        0
  TX Pause Packet Counter     0
  TX Unicast Counter          0
  RX Packets 64 Octets        17994
  RX Packets 65-127 Octets    8006
  RX Packets 128-255 Octets   230
  RX Packets 256-511 Octets   19
  RX Packets 512-1023 Octets  53
  RX Packets 1024-1518 Octets  11
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Packets 9217-16383 Octets  0
  RX Octets                   26313
  RX Multicast Packets        0
  RX Broadcast Packets        10886
  RX FCS Errors               0
  RX Fragments                0
  RX MAC Control Packets      0
  RX Out of Range Length      0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX Control Frame Counter    2
  RX Pause Frame Counter      2
```

```
  RX Byte Counter            1836287
  RX Unicast Frame Count     0
  RX Packet OK Count         0
Statistics for port 19 connected to device OTHER RE:
  TX Packets 64 Octets       10234
  TX Packets 65-127 Octets   162
  TX Packets 128-255 Octets  0
  TX Packets 256-511 Octets  0
  TX Packets 512-1023 Octets  0
  TX Packets 1024-1518 Octets  0
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX Packets 9217-16383 Octets  0
  TX Octets                  10396
  TX Multicast Packets       8
  TX Broadcast Packets       10317
  TX PAUSEMAC Ctrl Frames    0
  TX Oversize Packets        0
  TX FCS Error Counter       0
  TX Fragment Counter        0
  TX Byte Counter            666260
  TX Packet OK Counter       0
  TX Pause Packet Counter    0
  TX Unicast Counter         0
  RX Packets 64 Octets       4073
  RX Packets 65-127 Octets   325
  RX Packets 128-255 Octets  1
  RX Packets 256-511 Octets  0
  RX Packets 512-1023 Octets  0
  RX Packets 1024-1518 Octets  72
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Packets 9217-16383 Octets  0
  RX Octets                  4471
  RX Multicast Packets       0
  RX Broadcast Packets       10317
  RX FCS Errors              0
  RX Fragments               0
  RX MAC Control Packets     0
  RX Out of Range Length     0
  RX Undersize Packets       0
  RX Oversize Packets        0
  RX Jabbers                 0
  RX Control Frame Counter   0
  RX Pause Frame Counter     0
  RX Byte Counter            387333
  RX Unicast Frame Count     0
  RX Packet OK Count         0
Statistics for port 20 connected to device RE:
  TX Packets 64 Octets       658856
  TX Packets 65-127 Octets   45535
  TX Packets 128-255 Octets  1900
  TX Packets 256-511 Octets  532
  TX Packets 512-1023 Octets  372
  TX Packets 1024-1518 Octets  191
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX Packets 9217-16383 Octets  0
```



```
  TX Octets                   707386
  TX Multicast Packets        0
  TX Broadcast Packets        10421
  TX PAUSEMAC Ctrl Frames     0
  TX Oversize Packets         0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             46608676
  TX Packet OK Counter        0
  TX Pause Packet Counter     0
  TX Unicast Counter          0
  RX Packets 64 Octets        27394
  RX Packets 65-127 Octets    20271
  RX Packets 128-255 Octets   78
  RX Packets 256-511 Octets   215
  RX Packets 512-1023 Octets  269
  RX Packets 1024-1518 Octets  253370
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Packets 9217-16383 Octets  0
  RX Octets                   301597
  RX Multicast Packets        8
  RX Broadcast Packets        10421
  RX FCS Errors               0
  RX Fragments                0
  RX MAC Control Packets      0
  RX Out of Range Length      0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             275043436
  RX Unicast Frame Count      0
  RX Packet OK Count          0

Continued ...
```

show chassis ethernet-switch port-state (PTX5000 Packet Transport Router)

```
user@host> show chassis ethernet-switch port-state
Displaying port state for switch 0
Port       : 02
Target     : SPMB

Error reading port 2 connected to device: SPMB
```

show chassis fan

List of Syntax

Syntax on page 990
Syntax (ACX4000 Series Router) on page 990
Syntax (MX Series Router) on page 990
Syntax (T Series Routers) on page 990
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router) on page 990
Syntax (QFX Series) on page 990
Syntax (OCX Series) on page 990
Syntax (TX Matrix Router) on page 990
Syntax (TX Matrix Plus Router) on page 990

Syntax

show chassis fan

Syntax (ACX4000 Series Router)

show chassis fan

Syntax (MX Series Router)

show chassis fan
<all-members>
<local>
<member *member-id*>

Syntax (T Series Routers)

show chassis fan

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router)

show chassis fan

Syntax (QFX Series)

show chassis fan
<interconnect-device *name*>

Syntax (OCX Series)

show chassis fan

Syntax (TX Matrix Router)

show chassis fan
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show chassis fan
<lcc *number* | sfc *number*>

Release Information

Command introduced in Junos OS Release 10.0 on MX Series 3D Universal Edge Routers, M120 routers, and M320 routers, T320 routers, T640 routers, T1600 routers, TX Matrix Routers, and TX Matrix Plus routers.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 11.4 for EX Series switches.
Command introduced in Junos OS Release 12.3 for PTX5000 Packet Transport Routers.
Command introduced in Junos OS Release 12.1 for T4000 routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for ACX Series Routers.

Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description (T Series routers, TX Matrix routers, TX Matrix Plus routers, M120 routers, M320 routers, MX104 routers, MX2010 routers, MX2020 routers, MX Series 3D Universal Edge Routers, QFX3008-I Interconnect devices, QFX Series, OCX Series, EX Series switches, and PTX Series Packet Transport Routers only) Show information about the fan tray and fans.

Options

all-members—(MX Series routers only) (Optional) Display information about the fan tray and fans for all members of the Virtual Chassis configuration.

local—(MX Series routers only) (Optional) Display information about the fan tray and fans for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display information about the fan tray and fans for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* variable with a value 0 or 1.

interconnect-device *name*—(QFX3000-G QFabric systems only) (Optional) Display information about the fan tray and fans for the specified QFX3008-I Interconnect device.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display information about the fan tray and fans for the specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display information about the fan tray and fans for the specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc —(TX Matrix routers only) (Optional) Display information about the fan tray and fans for the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display information about the fan tray and fans for the TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with **0**.

Required Privilege Level view

List of Sample Output show chassis fan on page 993

Output Fields Table 66 on page 992 lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

Table 66: show chassis fan Output Fields

Field Name	Field Description
Item	Fan item identifier.
Status	Status of the fan: • **OK**—Fan is running properly and within the normal range. • **Check**—Fan is in **Check** state because of some fault or alarm condition.
RPM	(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed in revolutions per minute (RPM).
% RPM	(MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Percentage of the fan speed being used.
Measurement	(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed status based on different chassis cooling requirements: • Spinning at high speed • Spinning at intermediate speed • Spinning at normal speed • Spinning at low speed (except EX Series switches) (MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Fan speed in revolutions per minute (RPM) for each fan in the fan tray.

Sample Output

show chassis fan

user@host> **show chassis fan**

```
Item                      Status   RPM     Measurement
Top Tray Fan 1            OK       3790    Spinning at normal speed
Top Tray Fan 2            OK       3769    Spinning at normal speed
Top Tray Fan 3            OK       3769    Spinning at normal speed
Top Tray Fan 4            OK       3790    Spinning at normal speed
Top Tray Fan 5            OK       3790    Spinning at normal speed
Top Tray Fan 6            OK       3769    Spinning at normal speed
Top Tray Fan 7            OK       3790    Spinning at normal speed
Top Tray Fan 8            OK       3769    Spinning at normal speed
Top Tray Fan 9            OK       3769    Spinning at normal speed
Top Tray Fan 10           OK       3790    Spinning at normal speed
Top Tray Fan 11           OK       3790    Spinning at normal speed
Top Tray Fan 12           OK       3769    Spinning at normal speed
Bottom Tray Fan 1         OK       2880    Spinning at normal speed
Bottom Tray Fan 2         OK       2912    Spinning at normal speed
Bottom Tray Fan 3         OK       2928    Spinning at normal speed
Bottom Tray Fan 4         OK       2896    Spinning at normal speed
Bottom Tray Fan 5         OK       2896    Spinning at normal speed
Bottom Tray Fan 6         OK       2928    Spinning at normal speed
```

show chassis fan (QFabric Systems)

user@host> **show chassis fan interconnect-device *interconnect1***

```
Item                      Status   RPM     Measurement
TFT 0 Fan 0               OK       2849    Spinning at normal speed
TFT 0 Fan 1               OK       2821    Spinning at normal speed
TFT 0 Fan 2               OK       2735    Spinning at normal speed
TFT 0 Fan 3               OK       2815    Spinning at normal speed
TFT 0 Fan 4               OK       2828    Spinning at normal speed
TFT 0 Fan 5               OK       2863    Spinning at normal speed
BFT 1 Fan 0               OK       2941    Spinning at normal speed
BFT 1 Fan 1               OK       3008    Spinning at normal speed
BFT 1 Fan 2               OK       3073    Spinning at normal speed
BFT 1 Fan 3               OK       2925    Spinning at normal speed
BFT 1 Fan 4               OK       2863    Spinning at normal speed
BFT 1 Fan 5               OK       2933    Spinning at normal speed
SFT 0 Fan 0 Rotor 0       OK       15472   Spinning at normal speed
SFT 0 Fan 0 Rotor 1       OK       14477   Spinning at normal speed
SFT 0 Fan 1 Rotor 0       OK       15561   Spinning at normal speed
SFT 0 Fan 1 Rotor 1       OK       14210   Spinning at normal speed
SFT 0 Fan 2 Rotor 0       OK       16167   Spinning at normal speed
SFT 0 Fan 2 Rotor 1       OK       14248   Spinning at normal speed
SFT 0 Fan 3 Rotor 0       OK       16463   Spinning at normal speed
SFT 0 Fan 3 Rotor 1       OK       14099   Spinning at normal speed
SFT 1 Fan 0 Rotor 0       OK       15083   Spinning at normal speed
SFT 1 Fan 0 Rotor 1       OK       13533   Spinning at normal speed
SFT 1 Fan 1 Rotor 0       OK       16071   Spinning at normal speed
SFT 1 Fan 1 Rotor 1       OK       14400   Spinning at normal speed
SFT 1 Fan 2 Rotor 0       OK       15517   Spinning at normal speed
SFT 1 Fan 2 Rotor 1       OK       14210   Spinning at normal speed
SFT 1 Fan 3 Rotor 0       OK       16413   Spinning at normal speed
SFT 1 Fan 3 Rotor 1       OK       14400   Spinning at normal speed
SFT 2 Fan 0 Rotor 0       OK       15297   Spinning at normal speed
SFT 2 Fan 0 Rotor 1       OK       14634   Spinning at normal speed
```



```
SFT 2 Fan 1 Rotor 0        OK      15561    Spinning at normal speed
SFT 2 Fan 1 Rotor 1        OK      14285    Spinning at normal speed
SFT 2 Fan 2 Rotor 0        OK      15835    Spinning at normal speed
SFT 2 Fan 2 Rotor 1        OK      14400    Spinning at normal speed
SFT 2 Fan 3 Rotor 0        OK      15789    Spinning at normal speed
SFT 2 Fan 3 Rotor 1        OK      14323    Spinning at normal speed
SFT 3 Fan 0 Rotor 0        OK      16314    Spinning at normal speed
SFT 3 Fan 0 Rotor 1        OK      14876    Spinning at normal speed
SFT 3 Fan 1 Rotor 0        OK      15835    Spinning at normal speed
SFT 3 Fan 1 Rotor 1        OK      14323    Spinning at normal speed
SFT 3 Fan 2 Rotor 0        OK      16265    Spinning at normal speed
SFT 3 Fan 2 Rotor 1        OK      14594    Spinning at normal speed
SFT 3 Fan 3 Rotor 0        OK      16071    Spinning at normal speed
SFT 3 Fan 3 Rotor 1        OK      14323    Spinning at normal speed
SFT 4 Fan 0 Rotor 0        OK      15652    Spinning at normal speed
SFT 4 Fan 0 Rotor 1        OK      14438    Spinning at normal speed
SFT 4 Fan 1 Rotor 0        OK      16167    Spinning at normal speed
SFT 4 Fan 1 Rotor 1        OK      14555    Spinning at normal speed
SFT 4 Fan 2 Rotor 0        OK      16023    Spinning at normal speed
SFT 4 Fan 2 Rotor 1        OK      14361    Spinning at normal speed
SFT 4 Fan 3 Rotor 0        OK      16216    Spinning at normal speed
SFT 4 Fan 3 Rotor 1        OK      14438    Spinning at normal speed
SFT 5 Fan 0 Rotor 0        OK      15297    Spinning at normal speed
SFT 5 Fan 0 Rotor 1        OK      14173    Spinning at normal speed
SFT 5 Fan 1 Rotor 0        OK      15472    Spinning at normal speed
SFT 5 Fan 1 Rotor 1        OK      13846    Spinning at normal speed
SFT 5 Fan 2 Rotor 0        OK      15340    Spinning at normal speed
SFT 5 Fan 2 Rotor 1        OK      13917    Spinning at normal speed
SFT 5 Fan 3 Rotor 0        OK      15835    Spinning at normal speed
SFT 5 Fan 3 Rotor 1        OK      13917    Spinning at normal speed
SFT 6 Fan 0 Rotor 0        OK      15743    Spinning at normal speed
SFT 6 Fan 0 Rotor 1        OK      14594    Spinning at normal speed
SFT 6 Fan 1 Rotor 0        OK      16167    Spinning at normal speed
SFT 6 Fan 1 Rotor 1        OK      14634    Spinning at normal speed
SFT 6 Fan 2 Rotor 0        OK      16167    Spinning at normal speed
SFT 6 Fan 2 Rotor 1        OK      14516    Spinning at normal speed
SFT 6 Fan 3 Rotor 0        OK      16666    Spinning at normal speed
SFT 6 Fan 3 Rotor 1        OK      14438    Spinning at normal speed
SFT 7 Fan 0 Rotor 0        OK      15517    Spinning at normal speed
SFT 7 Fan 0 Rotor 1        OK      14438    Spinning at normal speed
SFT 7 Fan 1 Rotor 0        OK      15517    Spinning at normal speed
SFT 7 Fan 1 Rotor 1        OK      14361    Spinning at normal speed
SFT 7 Fan 2 Rotor 0        OK      16167    Spinning at normal speed
SFT 7 Fan 2 Rotor 1        OK      14555    Spinning at normal speed
SFT 7 Fan 3 Rotor 0        OK      15697    Spinning at normal speed
SFT 7 Fan 3 Rotor 1        OK      14361    Spinning at normal speed
```

show chassis fan (EX Series Switches)

user@host> **show chassis fan**

```
Item                       Status  RPM      Measurement
Fan 1                      OK      3477     Spinning at normal speed
Fan 2                      OK      3477     Spinning at normal speed
Fan 3                      OK      3479     Spinning at normal speed
Fan 4                      OK      3508     Spinning at normal speed
Fan 5                      OK      3517     Spinning at normal speed
Fan 6                      OK      3531     Spinning at normal speed
Fan 7                      OK      3439     Spinning at normal speed
Fan 8                      OK      3424     Spinning at normal speed
Fan 9                      OK      3413     Spinning at normal speed
```



```
Fan 10                     OK       3439     Spinning at normal speed
Fan 11                     OK       3446     Spinning at normal speed
Fan 12                     OK       3432     Spinning at normal speed
```

show chassis fan (T320 Router)

user@host> **show chassis fan**

```
     Item                 Status    RPM      Measurement
Top Left Front fan         OK       2850     Spinning at normal speed
Top Left Middle fan        OK       2820     Spinning at normal speed
Top Left Rear fan          OK       2970     Spinning at normal speed
Top Right Front fan        OK       2790     Spinning at normal speed
Top Right Middle fan       OK       2640     Spinning at normal speed
Top Right Rear fan         OK       2790     Spinning at normal speed
Bottom Left Front fan      OK       2520     Spinning at normal speed
Bottom Left Middle fan     OK       2610     Spinning at normal speed
Bottom Left Rear fan       OK       2550     Spinning at normal speed
Bottom Right Front fan     OK       2610     Spinning at normal speed
Bottom Right Middle fan    OK       2880     Spinning at normal speed
Bottom Right Rear fan      OK       2790     Spinning at normal speed
Rear Tray Top fan          OK       2130     Spinning at normal speed
Rear Tray Second fan       OK       2190     Spinning at normal speed
Rear Tray Middle fan       OK       2250     Spinning at normal speed
Rear Tray Fourth fan       OK       2220     Spinning at normal speed
Rear Tray Bottom fan       OK       2280     Spinning at normal speed
```

show chassis fan (T640 Router)

user@host> **show chassis fan**

```
   Item                   Status    RPM      Measurement
Top Left Front fan         OK       3420     Spinning at normal speed
Top Left Middle fan        OK       3420     Spinning at normal speed
Top Left Rear fan          OK       3420     Spinning at normal speed
Top Right Front fan        OK       3420     Spinning at normal speed
Top Right Middle fan       OK       3420     Spinning at normal speed
Top Right Rear fan         OK       3450     Spinning at normal speed
Bottom Left Front fan      OK       3390     Spinning at normal speed
Bottom Left Middle fan     OK       3420     Spinning at normal speed
Bottom Left Rear fan       OK       3390     Spinning at normal speed
Bottom Right Front fan     OK       3390     Spinning at normal speed
Bottom Right Middle fan    OK       3390     Spinning at normal speed
Bottom Right Rear fan      OK       3390     Spinning at normal speed
Rear Tray Top fan          OK       5220     Spinning at normal speed
Rear Tray Second fan       OK       5220     Spinning at normal speed
Rear Tray Third fan        OK       5220     Spinning at normal speed
Rear Tray Fourth fan       OK       5220     Spinning at normal speed
Rear Tray Fifth fan        OK       5220     Spinning at normal speed
Rear Tray Sixth fan        OK       5220     Spinning at normal speed
Rear Tray Seventh fan      OK       5220     Spinning at normal speed
Rear Tray Bottom fan       OK       5220     Spinning at normal speed
```

show chassis fan (T1600 Router)

user@host> **show chassis fan**

```
  Item                    Status    RPM      Measurement
Top Left Front fan         OK       3420     Spinning at normal speed
Top Left Middle fan        OK       3420     Spinning at normal speed
Top Left Rear fan          OK       3450     Spinning at normal speed
Top Right Front fan        OK       3420     Spinning at normal speed
```



```
Top Right Middle fan      OK       3420    Spinning at normal speed
Top Right Rear fan        OK       3390    Spinning at normal speed
Bottom Left Front fan     OK       3420    Spinning at normal speed
Bottom Left Middle fan    OK       3420    Spinning at normal speed
Bottom Left Rear fan      OK       3390    Spinning at normal speed
Bottom Right Front fan    OK       3390    Spinning at normal speed
Bottom Right Middle fan   OK       3420    Spinning at normal speed
Bottom Right Rear fan     OK       3390    Spinning at normal speed
Rear Tray Top fan         OK       5190    Spinning at normal speed
Rear Tray Second fan      OK       5190    Spinning at normal speed
Rear Tray Third fan       OK       5190    Spinning at normal speed
Rear Tray Fourth fan      OK       5190    Spinning at normal speed
Rear Tray Fifth fan       OK       5190    Spinning at normal speed
Rear Tray Sixth fan       OK       5190    Spinning at normal speed
Rear Tray Seventh fan     OK       5190    Spinning at normal speed
Rear Tray Bottom fan      OK       5190    Spinning at normal speed
```

show chassis fan (T4000 Core Router)

```
user@host> show chassis fan

      Item                      Status   RPM     Measurement
      Top Left Front fan        OK       5190    Spinning at high speed
      Top Left Middle fan       OK       5220    Spinning at high speed
      Top Left Rear fan         OK       5190    Spinning at high speed
      Top Right Front fan       OK       5160    Spinning at high speed
      Top Right Middle fan      OK       5190    Spinning at high speed
      Top Right Rear fan        OK       5160    Spinning at high speed
      Bottom Left Front fan     OK       6030    Spinning at high speed
      Bottom Left Middle fan    OK       6090    Spinning at high speed
      Bottom Left Rear fan      OK       6090    Spinning at high speed
      Bottom Right Front fan    OK       6030    Spinning at high speed
      Bottom Right Middle fan   OK       6060    Spinning at high speed
      Bottom Right Rear fan     OK       6060    Spinning at high speed
      Rear Tray Top fan         OK       10000   Spinning at high speed
      Rear Tray Second fan      OK       10000   Spinning at high speed
      Rear Tray Third fan       OK       10000   Spinning at high speed
      Rear Tray Fourth fan      OK       10000   Spinning at high speed
      Rear Tray Fifth fan       OK       10000   Spinning at high speed
      Rear Tray Sixth fan       OK       10000   Spinning at high speed
      Rear Tray Seventh fan     OK       10000   Spinning at high speed
      Rear Tray Bottom fan      OK       10000   Spinning at high speed
```

show chassis fan (TX Matrix Router)

```
user@host> show chassis fan
scc-re0:
--------------------------------------------------------------------------
      Item                      Status   RPM     Measurement
      Top Left Front fan        OK       3420    Spinning at normal speed
      Top Left Middle fan       OK       3390    Spinning at normal speed
      Top Left Rear fan         OK       3420    Spinning at normal speed
      Top Right Front fan       OK       3390    Spinning at normal speed
      Top Right Middle fan      OK       3420    Spinning at normal speed
      Top Right Rear fan        OK       3390    Spinning at normal speed
      Bottom Left Front fan     OK       3420    Spinning at normal speed
      Bottom Left Middle fan    OK       3450    Spinning at normal speed
      Bottom Left Rear fan      OK       3420    Spinning at normal speed
      Bottom Right Front fan    OK       3420    Spinning at normal speed
      Bottom Right Middle fan   OK       3420    Spinning at normal speed
      Bottom Right Rear fan     OK       3420    Spinning at normal speed
```

```
      Rear Tray Top fan          OK        3420    Spinning at normal speed
      Rear Tray Second fan       OK        5190    Spinning at normal speed
      Rear Tray Third fan        OK        5190    Spinning at normal speed
      Rear Tray Fourth fan       OK        5190    Spinning at normal speed
      Rear Tray Fifth fan        OK        3420    Spinning at normal speed
      Rear Tray Sixth fan        OK        3420    Spinning at normal speed
      Rear Tray Seventh fan      OK        3420    Spinning at normal speed
      Rear Tray Bottom fan       OK        3420    Spinning at normal speed

lcc2-re0:
--------------------------------------------------------------------------
      Item                       Status    RPM     Measurement
      Top Left Front fan         OK        3420    Spinning at normal speed
      Top Left Middle fan        OK        3420    Spinning at normal speed
      Top Left Rear fan          OK        3450    Spinning at normal speed
      Top Right Front fan        OK        3420    Spinning at normal speed
      Top Right Middle fan       OK        3450    Spinning at normal speed
      Top Right Rear fan         OK        3360    Spinning at normal speed
      Bottom Left Front fan      OK        3420    Spinning at normal speed
      Bottom Left Middle fan     OK        3480    Spinning at normal speed
      Bottom Left Rear fan       OK        3420    Spinning at normal speed
      Bottom Right Front fan     OK        3420    Spinning at normal speed
      Bottom Right Middle fan    OK        3390    Spinning at normal speed
      Bottom Right Rear fan      OK        3420    Spinning at normal speed
      Rear Tray Top fan          OK        3420    Spinning at normal speed
      Rear Tray Second fan       OK        3420    Spinning at normal speed
      Rear Tray Third fan        OK        3420    Spinning at normal speed
      Rear Tray Fourth fan       OK        3420    Spinning at normal speed
      Rear Tray Fifth fan        OK        3420    Spinning at normal speed
      Rear Tray Sixth fan        OK        3420    Spinning at normal speed
      Rear Tray Seventh fan      OK        3420    Spinning at normal speed
      Rear Tray Bottom fan       OK        3420    Spinning at normal speed
```

show chassis fan (TX Matrix Plus Router)

```
user@host> show chassis fan
  sfc0-re0:
--------------------------------------------------------------------------
      Item                       Status    RPM     Measurement
      Fan Tray 0 Fan 1           OK        4350    Spinning at normal speed
      Fan Tray 0 Fan 2           OK        4380    Spinning at normal speed
      Fan Tray 0 Fan 3           OK        4410    Spinning at normal speed
      Fan Tray 0 Fan 4           OK        4380    Spinning at normal speed
      Fan Tray 0 Fan 5           OK        4350    Spinning at normal speed
      Fan Tray 0 Fan 6           OK        4380    Spinning at normal speed
      Fan Tray 1 Fan 1           OK        4410    Spinning at normal speed
      Fan Tray 1 Fan 2           OK        4380    Spinning at normal speed
      Fan Tray 1 Fan 3           OK        4410    Spinning at normal speed
      Fan Tray 1 Fan 4           OK        4380    Spinning at normal speed
      Fan Tray 1 Fan 5           OK        4410    Spinning at normal speed
      Fan Tray 1 Fan 6           OK        4410    Spinning at normal speed
      Fan Tray 2 Fan 1           OK        4380    Spinning at normal speed
      Fan Tray 2 Fan 2           OK        4380    Spinning at normal speed
      Fan Tray 2 Fan 3           OK        4380    Spinning at normal speed
      Fan Tray 2 Fan 4           OK        4410    Spinning at normal speed
      Fan Tray 2 Fan 5           OK        4380    Spinning at normal speed
      Fan Tray 2 Fan 6           OK        4410    Spinning at normal speed
      Fan Tray 2 Fan 7           OK        4410    Spinning at normal speed
      Fan Tray 2 Fan 8           OK        4380    Spinning at normal speed
      Fan Tray 2 Fan 9           OK        4380    Spinning at normal speed
      Fan Tray 3 Fan 1           OK        4350    Spinning at normal speed
```

```
        Fan Tray 3 Fan 2          OK       4380    Spinning at normal speed
        Fan Tray 3 Fan 3          OK       4410    Spinning at normal speed
        Fan Tray 3 Fan 4          OK       4440    Spinning at normal speed
        Fan Tray 3 Fan 5          OK       4380    Spinning at normal speed
        Fan Tray 3 Fan 6          OK       4410    Spinning at normal speed
        Fan Tray 3 Fan 7          OK       4410    Spinning at normal speed
        Fan Tray 3 Fan 8          OK       4380    Spinning at normal speed
        Fan Tray 3 Fan 9          OK       4410    Spinning at normal speed
        Fan Tray 4 Fan 1          OK       4410    Spinning at normal speed
        Fan Tray 4 Fan 2          OK       4410    Spinning at normal speed
        Fan Tray 4 Fan 3          OK       4380    Spinning at normal speed
        Fan Tray 4 Fan 4          OK       4380    Spinning at normal speed
        Fan Tray 4 Fan 5          OK       4410    Spinning at normal speed
        Fan Tray 4 Fan 6          OK       4410    Spinning at normal speed
        Fan Tray 4 Fan 7          OK       4410    Spinning at normal speed
        Fan Tray 4 Fan 8          OK       4410    Spinning at normal speed
        Fan Tray 4 Fan 9          OK       4410    Spinning at normal speed
        Fan Tray 5 Fan 1          OK       4350    Spinning at normal speed
        Fan Tray 5 Fan 2          OK       4380    Spinning at normal speed
        Fan Tray 5 Fan 3          OK       4380    Spinning at normal speed
        Fan Tray 5 Fan 4          OK       4350    Spinning at normal speed
        Fan Tray 5 Fan 5          OK       4380    Spinning at normal speed
        Fan Tray 5 Fan 6          OK       4410    Spinning at normal speed
        Fan Tray 5 Fan 7          OK       4410    Spinning at normal speed
        Fan Tray 5 Fan 8          OK       4380    Spinning at normal speed
        Fan Tray 5 Fan 9          OK       4410    Spinning at normal speed

lcc0-re0:
--------------------------------------------------------------------------
        Item                      Status   RPM     Measurement
        Top Left Front fan        OK       3420    Spinning at normal speed
        Top Left Middle fan       OK       3420    Spinning at normal speed
        Top Left Rear fan         OK       3420    Spinning at normal speed
        Top Right Front fan       OK       3450    Spinning at normal speed
        Top Right Middle fan      OK       3420    Spinning at normal speed
        Top Right Rear fan        OK       3420    Spinning at normal speed
        Bottom Left Front fan     OK       3420    Spinning at normal speed
        Bottom Left Middle fan    OK       3420    Spinning at normal speed
        Bottom Left Rear fan      OK       3390    Spinning at normal speed
        Bottom Right Front fan    OK       3420    Spinning at normal speed
        Bottom Right Middle fan   OK       3390    Spinning at normal speed
        Bottom Right Rear fan     OK       3390    Spinning at normal speed
        Rear Tray Top fan         OK       7050    Spinning at normal speed
        Rear Tray Second fan      OK       7050    Spinning at normal speed
        Rear Tray Third fan       OK       7050    Spinning at normal speed
        Rear Tray Fourth fan      OK       7050    Spinning at normal speed
        Rear Tray Fifth fan       OK       7050    Spinning at normal speed
        Rear Tray Sixth fan       OK       7050    Spinning at normal speed
        Rear Tray Seventh fan     OK       7050    Spinning at normal speed
        Rear Tray Bottom fan      OK       7050    Spinning at normal speed
```

show chassis fan (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fan
sfc0-re0:
--------------------------------------------------------------------------
        Item                      Status   RPM     Measurement
        Fan Tray 0 Fan 1          OK       4830    Spinning at normal speed
        Fan Tray 0 Fan 2          OK       4860    Spinning at normal speed
        Fan Tray 0 Fan 3          OK       4830    Spinning at normal speed
        Fan Tray 0 Fan 4          OK       4800    Spinning at normal speed
```



```
        Fan Tray 0 Fan 5           OK       4830    Spinning at normal speed
        Fan Tray 0 Fan 6           OK       4770    Spinning at normal speed
        Fan Tray 1 Fan 1           OK       4800    Spinning at normal speed
        Fan Tray 1 Fan 2           OK       4770    Spinning at normal speed
        Fan Tray 1 Fan 3           OK       4800    Spinning at normal speed
        Fan Tray 1 Fan 4           OK       4770    Spinning at normal speed
        Fan Tray 1 Fan 5           OK       4770    Spinning at normal speed
        Fan Tray 1 Fan 6           OK       4800    Spinning at normal speed
        Fan Tray 2 Fan 1           OK       4800    Spinning at normal speed
        Fan Tray 2 Fan 2           OK       4800    Spinning at normal speed
        Fan Tray 2 Fan 3           OK       4830    Spinning at normal speed
        Fan Tray 2 Fan 4           OK       4830    Spinning at normal speed
        Fan Tray 2 Fan 5           OK       4830    Spinning at normal speed
        Fan Tray 2 Fan 6           OK       4830    Spinning at normal speed
        Fan Tray 2 Fan 7           OK       4800    Spinning at normal speed
        Fan Tray 2 Fan 8           OK       4830    Spinning at normal speed
        Fan Tray 2 Fan 9           OK       4800    Spinning at normal speed
        Fan Tray 3 Fan 1           OK       4860    Spinning at normal speed
        Fan Tray 3 Fan 2           OK       4860    Spinning at normal speed
        Fan Tray 3 Fan 3           OK       4800    Spinning at normal speed
        Fan Tray 3 Fan 4           OK       4830    Spinning at normal speed
        Fan Tray 3 Fan 5           OK       4830    Spinning at normal speed
        Fan Tray 3 Fan 6           OK       4830    Spinning at normal speed
        Fan Tray 3 Fan 7           OK       4830    Spinning at normal speed
        Fan Tray 3 Fan 8           OK       4800    Spinning at normal speed
        Fan Tray 3 Fan 9           OK       4800    Spinning at normal speed
        Fan Tray 4 Fan 1           OK       4830    Spinning at normal speed
        Fan Tray 4 Fan 2           OK       4830    Spinning at normal speed
        Fan Tray 4 Fan 3           OK       4830    Spinning at normal speed
        Fan Tray 4 Fan 4           OK       4830    Spinning at normal speed
        Fan Tray 4 Fan 5           OK       4830    Spinning at normal speed
        Fan Tray 4 Fan 6           OK       4860    Spinning at normal speed
        Fan Tray 4 Fan 7           OK       4800    Spinning at normal speed
        Fan Tray 4 Fan 8           OK       4860    Spinning at normal speed
        Fan Tray 4 Fan 9           OK       4770    Spinning at normal speed
        Fan Tray 5 Fan 1           OK       4830    Spinning at normal speed
        Fan Tray 5 Fan 2           OK       4830    Spinning at normal speed
        Fan Tray 5 Fan 3           OK       4830    Spinning at normal speed
        Fan Tray 5 Fan 4           OK       4800    Spinning at normal speed
        Fan Tray 5 Fan 5           OK       4800    Spinning at normal speed
        Fan Tray 5 Fan 6           OK       4800    Spinning at normal speed
        Fan Tray 5 Fan 7           OK       4830    Spinning at normal speed
        Fan Tray 5 Fan 8           OK       4830    Spinning at normal speed
        Fan Tray 5 Fan 9           Check    2010

lcc0-re0:
--------------------------------------------------------------------------
        Item                       Status   RPM     Measurement
        Top Left Front fan         OK       3420    Spinning at normal speed
        Top Left Middle fan        OK       3390    Spinning at normal speed
        Top Left Rear fan          OK       3390    Spinning at normal speed
        Top Right Front fan        OK       3420    Spinning at normal speed
        Top Right Middle fan       OK       3420    Spinning at normal speed
        Top Right Rear fan         OK       3450    Spinning at normal speed
        Bottom Left Front fan      OK       3420    Spinning at normal speed
        Bottom Left Middle fan     OK       3390    Spinning at normal speed
        Bottom Left Rear fan       OK       3420    Spinning at normal speed
        Bottom Right Front fan     OK       3420    Spinning at normal speed
        Bottom Right Middle fan    OK       3390    Spinning at normal speed
        Bottom Right Rear fan      OK       3420    Spinning at normal speed
        Rear Tray fan 1 (Top)      OK       7740    Spinning at normal speed
```

```
        Rear Tray fan 2            OK        7740     Spinning at normal speed
        Rear Tray fan 3            OK        7740     Spinning at normal speed
        Rear Tray fan 4            OK        7740     Spinning at normal speed
        Rear Tray fan 5            OK        7740     Spinning at normal speed
        Rear Tray fan 6            OK        7740     Spinning at normal speed
        Rear Tray fan 7            OK        7740     Spinning at normal speed
        Rear Tray fan 8            OK        7740     Spinning at normal speed
        Rear Tray fan 9            OK        7740     Spinning at normal speed
        Rear Tray fan 10           OK        7740     Spinning at normal speed
        Rear Tray fan 11           OK        7740     Spinning at normal speed
        Rear Tray fan 12           OK        7740     Spinning at normal speed
        Rear Tray fan 13           OK        7740     Spinning at normal speed
        Rear Tray fan 14           OK        7740     Spinning at normal speed
        Rear Tray fan 15           OK        7740     Spinning at normal speed
        Rear Tray fan 16 (Bottom)  OK        7740     Spinning at normal speed

lcc2-re0:
--------------------------------------------------------------------------
        Item                       Status    RPM      Measurement
        Top Left Front fan         OK        3420     Spinning at normal speed
        Top Left Middle fan        OK        3390     Spinning at normal speed
        Top Left Rear fan          OK        3420     Spinning at normal speed
        Top Right Front fan        OK        3420     Spinning at normal speed
        Top Right Middle fan       OK        3420     Spinning at normal speed
        Top Right Rear fan         OK        3450     Spinning at normal speed
        Bottom Left Front fan      OK        3420     Spinning at normal speed
        Bottom Left Middle fan     OK        3390     Spinning at normal speed
        Bottom Left Rear fan       OK        3420     Spinning at normal speed
        Bottom Right Front fan     OK        3420     Spinning at normal speed
        Bottom Right Middle fan    OK        3390     Spinning at normal speed
        Bottom Right Rear fan      OK        3420     Spinning at normal speed
        Rear Tray fan 1 (Top)      OK        7740     Spinning at normal speed
        Rear Tray fan 2            OK        7740     Spinning at normal speed
        Rear Tray fan 3            OK        7740     Spinning at normal speed
        Rear Tray fan 4            OK        7740     Spinning at normal speed
        Rear Tray fan 5            OK        7740     Spinning at normal speed
        Rear Tray fan 6            OK        7740     Spinning at normal speed
        Rear Tray fan 7            OK        7740     Spinning at normal speed
        Rear Tray fan 8            OK        7740     Spinning at normal speed
        Rear Tray fan 9            OK        7740     Spinning at normal speed
        Rear Tray fan 10           OK        7740     Spinning at normal speed
        Rear Tray fan 11           OK        7740     Spinning at normal speed
        Rear Tray fan 12           OK        7740     Spinning at normal speed
        Rear Tray fan 13           OK        7740     Spinning at normal speed
        Rear Tray fan 14           OK        7740     Spinning at normal speed
        Rear Tray fan 15           OK        7740     Spinning at normal speed
        Rear Tray fan 16 (Bottom)  OK        7740     Spinning at normal speed
```

show chassis fan (PTX5000 Packet Transport Router)

```
user@host> show chassis fan
user@host> show chassis fan
        Item                       Status    % RPM      Measurement
        Fan Tray 0 Fan 1           OK        29%        2700 RPM
        Fan Tray 0 Fan 2           OK        29%        2700 RPM
        Fan Tray 0 Fan 3           OK        29%        2742 RPM
        Fan Tray 0 Fan 4           OK        29%        2700 RPM
        Fan Tray 0 Fan 5           OK        30%        2828 RPM
        Fan Tray 0 Fan 6           OK        30%        2828 RPM
        Fan Tray 0 Fan 7           OK        29%        2700 RPM
        Fan Tray 0 Fan 8           OK        30%        2785 RPM
```



```
Fan Tray 0 Fan 9          OK        30%        2828 RPM
Fan Tray 0 Fan 10         OK        30%        2828 RPM
Fan Tray 0 Fan 11         OK        30%        2785 RPM
Fan Tray 0 Fan 12         OK        30%        2828 RPM
Fan Tray 0 Fan 13         OK        31%        2871 RPM
Fan Tray 0 Fan 14         OK        30%        2828 RPM
Fan Tray 1 Fan 1          OK        42%        3033 RPM
Fan Tray 1 Fan 2          OK        42%        3066 RPM
Fan Tray 1 Fan 3          OK        43%        3099 RPM
Fan Tray 1 Fan 4          OK        43%        3166 RPM
Fan Tray 1 Fan 5          OK        45%        3266 RPM
Fan Tray 1 Fan 6          OK        43%        3133 RPM
Fan Tray 2 Fan 1          OK        29%        2099 RPM
Fan Tray 2 Fan 2          OK        30%        2199 RPM
Fan Tray 2 Fan 3          OK        30%        2166 RPM
Fan Tray 2 Fan 4          OK        33%        2399 RPM
Fan Tray 2 Fan 5          OK        29%        2133 RPM
Fan Tray 2 Fan 6          OK        32%        2366 RPM
```

show chassis fan (MX104 Router)

```
user@host > show chassis fan
Item                      Status    RPM     Measurement
      Fan 1                     OK        5640     Spinning at normal speed
      Fan 2                     OK        5640     Spinning at normal speed
      Fan 3                     OK        5760     Spinning at normal speed
      Fan 4                     OK        5640     Spinning at normal speed
      Fan 5                     OK        5640     Spinning at normal speed
```

show chassis fan (MX2010 Router)

```
user@host > show chassis fan
Item                      Status    % RPM     Measurement
      Fan Tray 0 Fan 1          OK        37%        3360 RPM
      Fan Tray 0 Fan 2          OK        38%        3480 RPM
      Fan Tray 0 Fan 3          OK        37%        3360 RPM
      Fan Tray 0 Fan 4          OK        37%        3360 RPM
      Fan Tray 0 Fan 5          OK        38%        3480 RPM
      Fan Tray 0 Fan 6          OK        37%        3360 RPM
      Fan Tray 1 Fan 1          OK        38%        3480 RPM
      Fan Tray 1 Fan 2          OK        40%        3600 RPM
      Fan Tray 1 Fan 3          OK        38%        3480 RPM
      Fan Tray 1 Fan 4          OK        38%        3480 RPM
      Fan Tray 1 Fan 5          OK        38%        3480 RPM
      Fan Tray 1 Fan 6          OK        38%        3480 RPM
      Fan Tray 2 Fan 1          OK        38%        3480 RPM
      Fan Tray 2 Fan 2          OK        41%        3720 RPM
      Fan Tray 2 Fan 3          OK        38%        3480 RPM
      Fan Tray 2 Fan 4          OK        38%        3480 RPM
      Fan Tray 2 Fan 5          OK        38%        3480 RPM
      Fan Tray 2 Fan 6          OK        38%        3480 RPM
      Fan Tray 3 Fan 1          OK        38%        3480 RPM
      Fan Tray 3 Fan 2          OK        40%        3600 RPM
      Fan Tray 3 Fan 3          OK        40%        3600 RPM
      Fan Tray 3 Fan 4          OK        40%        3600 RPM
      Fan Tray 3 Fan 5          OK        40%        3600 RPM
      Fan Tray 3 Fan 6          OK        38%        3480 RPM
```

show chassis fan (MX2020 Router)

```
user@host > show chassis fan
```

```
Item                   Status   % RPM    Measurement
Fan Tray 0 Fan 1       OK       37%      3360 RPM
Fan Tray 0 Fan 2       OK       37%      3360 RPM
Fan Tray 0 Fan 3       OK       36%      3240 RPM
Fan Tray 0 Fan 4       OK       37%      3360 RPM
Fan Tray 0 Fan 5       OK       37%      3360 RPM
Fan Tray 0 Fan 6       OK       37%      3360 RPM
Fan Tray 1 Fan 1       OK       37%      3360 RPM
Fan Tray 1 Fan 2       OK       37%      3360 RPM
Fan Tray 1 Fan 3       OK       37%      3360 RPM
Fan Tray 1 Fan 4       OK       37%      3360 RPM
Fan Tray 1 Fan 5       OK       37%      3360 RPM
Fan Tray 1 Fan 6       OK       36%      3240 RPM
Fan Tray 2 Fan 1       OK       37%      3360 RPM
Fan Tray 2 Fan 2       OK       37%      3360 RPM
Fan Tray 2 Fan 3       OK       37%      3360 RPM
Fan Tray 2 Fan 4       OK       37%      3360 RPM
Fan Tray 2 Fan 5       OK       37%      3360 RPM
Fan Tray 2 Fan 6       OK       38%      3480 RPM
Fan Tray 3 Fan 1       OK       38%      3480 RPM
Fan Tray 3 Fan 2       OK       38%      3480 RPM
Fan Tray 3 Fan 3       OK       38%      3480 RPM
Fan Tray 3 Fan 4       OK       37%      3360 RPM
Fan Tray 3 Fan 5       OK       37%      3360 RPM
Fan Tray 3 Fan 6       OK       37%      3360 RPM
```

show chassis fan (ACX4000 Router)

```
user@host > show chassis fan
      Item                   Status   RPM    Measurement
      Fan 1                  OK       4140   Spinning at normal speed
      Fan 2                  OK       4200   Spinning at normal speed
```

show chassis fan (QFX5100 Switch and OCX Series)

```
user@switch > show chassis fan
Item                     Status   RPM     Measurement
FPC 0 Tray 0 Fan 0       OK       6428    Spinning at normal speed
FPC 0 Tray 0 Fan 1       OK       5515    Spinning at normal speed
FPC 0 Tray 1 Fan 0       OK       6360    Spinning at normal speed
FPC 0 Tray 1 Fan 1       OK       5532    Spinning at normal speed
```


show chassis fabric degraded-fabric-reachability

Syntax show chassis fabric degraded-fabric-reachability

Release Information Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.

Description Display the current state of reachability between the Packet Forwarding Engines in the system.

Additional Information

Required Privilege Level view

Related Documentation

- show chassis fabric errors on page 1016
- show chassis fabric reachability on page 1125
- degraded on page 479

List of Sample Output show chassis fabric degraded-fabric-reachability on page 1003

Output Fields Table 67 on page 1003 lists the output fields for the **show chassis fabric degraded-fabric-reachability** command. Output fields are listed in the approximate order in which they appear.

Table 67: show chassis fabric degraded-fabric-reachability Output Fields

Field Name	Field Description
FPC	Display fabric reachability for the displayed FPC slot.
PFE	Display fabric reachability for the displayed PFE slot on a per SIB and plane basis.
SIBx_Plane y	Display the SIB (x) and plane (y) where link errors occurred.
Link errors FPC/PFEs	Display the list of FPC and PFE slots that are unreachable for the displayed SIB and plane due to link errors.

Sample Output

show chassis fabric degraded-fabric-reachability

```
user@host> show chassis fabric degraded-fabric-reachability
Degraded Fabric reachability Information:
FPC #0
    PFE #0
      SIB0_Plane 0
           Link errors  FPC/PFEs    2/0 5/0 5/1 5/2 5/3
      SIB0_Plane 1
           Link errors  FPC/PFEs    2/0 5/0
    PFE #1
      SIB0_Plane 0
```

```
     Link errors  FPC/PFEs    2/0 5/0 5/1 5/2 5/3
SIB0_Plane 1
     Link errors  FPC/PFEs    2/0 5/0
```

show chassis fabric destinations

List of Syntax

Syntax on page 1005
Syntax (MX240, MX480, MX960 , MX2010 and MX2020 3D Universal Edge Routers) on page 1005

Syntax

show chassis fabric destinations

Syntax (MX240, MX480, MX960 , MX2010 and MX2020 3D Universal Edge Routers)

show chassis fabric destinations fpc <*fpc-slot-number*>

Release Information

Command introduced in Junos OS Release 12.1 for MX240, MX480, and MX960 routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

Display the state of fabric destinations for all FPCs.

Options

none—Display information about the fabric destinations of all FPCs.

fpc-slot-number—(Optional) Display information about the specified FPC. For MX2020 routers, replace ***fpc-slot-number*** with a value from 0 through 19. For MX2010 routers, replace ***fpc-slot-number*** with a value from 0 through 9.

Required Privilege Level

view

Related Documentation

- **show chassis fabric redundancy-mode on page 1124**
- Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 361
- Corrective Actions for Fabric Failures on MX Series Routers on page 356
- Fabric Management on MPC4E Overview on page 21

List of Sample Output

show chassis fabric destinations fpc 1 (MX240 Router) on page 1006
show chassis fabric destinations fpc 2 (MX480 Router) on page 1007
show chassis fabric destinations fpc 4 (MX480 Router with MPC4E) on page 1007
show chassis fabric destinations (MX960 Router) on page 1008
show chassis fabric destinations fpc 1 (MX2020 Router) on page 1009
show chassis fabric destinations fpc 14 (MX2020 Router with MPC4E) on page 1010
show chassis fabric destinations (MX2010 Router) on page 1011

Output Fields

Table 68 on page 1006 lists the output fields for the **show chassis fabric destinations** command. Output fields are listed in the approximate order in which they appear.

Table 68: show chassis fabric destinations Output Fields

Field Name	Field Description
Fabric destinations state	Indicates the state of the fabric destinations: • **0**—Destination is non-existent. • **2**—Destination is enabled. • **3**—Destination is disabled. • **6**—Destination is in erroneous state and is disabled.
Flexible PIC Concentrator (FPC) number	Source FPC number.
Packet Forwarding Engine number	Source Packet Forwarding Engine number.
Plane number	Source plane number.

Sample Output

show chassis fabric destinations fpc 1 (MX240 Router)

In the output, the values followed by the plane number denote multiple quadruples. The first quadruple specifies FPC1, the second quadrapule specifies FPC2 and so on. Each quadruple specifies the states of the fabric plane to the Packet Forwarding Engines.

`user@host>` **show chassis fabric destinations fpc 1**

```
Fabric destinations state:
   0: non-existent
   2: enabled
   3: disabled
   6: dest-err and disabled

FPC 1
 PFE 0
  Plane 0   0000 3300 3333
  Plane 1   0000 2200 2222
  Plane 2   0000 2200 2222
  Plane 3   0000 2200 2222
  Plane 4   0000 2200 2222
  Plane 5   0000 3300 3333
  Plane 6   0000 3300 3333
  Plane 7   0000 3300 3333
 PFE 1
  Plane 0   0000 3300 3333
  Plane 1   0000 2200 2222
  Plane 2   0000 2200 2222
  Plane 3   0000 2200 2222
  Plane 4   0000 2200 2222
  Plane 5   0000 3300 3333
  Plane 6   0000 3300 3333
  Plane 7   0000 3300 3333
```


show chassis fabric destinations fpc 2 (MX480 Router)

user@host> **show chassis fabric destinations fpc 2**

```
Fabric destinations state:
   0: non-existent
   2: enabled
   3: disabled
   6: dest-err and disabled

FPC 2
 PFE 0
  Plane 0   0000 3300 3333
  Plane 1   0000 2200 2222
  Plane 2   0000 2200 2222
  Plane 3   0000 2200 2222
  Plane 4   0000 2200 2222
  Plane 5   0000 3300 3333
  Plane 6   0000 3300 3333
  Plane 7   0000 3300 3333
 PFE 1
  Plane 0   0000 3300 3333
  Plane 1   0000 2200 2222
  Plane 2   0000 2200 2222
  Plane 3   0000 2200 2222
  Plane 4   0000 2200 2222
  Plane 5   0000 3300 3333
  Plane 6   0000 3300 3333
  Plane 7   0000 3300 3333
 PFE 2
  Plane 0   0000 3300 3333
  Plane 1   0000 2200 2222
  Plane 2   0000 2200 2222
  Plane 3   0000 2200 2222
  Plane 4   0000 2200 2222
  Plane 5   0000 3300 3333
  Plane 6   0000 3300 3333
  Plane 7   0000 3300 3333
 PFE 3
  Plane 0   0000 3300 3333
  Plane 1   0000 2200 2222
  Plane 2   0000 2200 2222
  Plane 3   0000 2200 2222
  Plane 4   0000 2200 2222
  Plane 5   0000 3300 3333
  Plane 6   0000 3300 3333
  Plane 7   0000 3300 3333
```

show chassis fabric destinations fpc 4 (MX480 Router with MPC4E)

user@host > **show chassis fabric destinations fpc 4**

```
Fabric destinations state:
   0: non-existent
   2: enabled
   3: disabled
   6: dest-err and disabled

FPC 4
 PFE 0
  Plane 0   2200 2222 0000   2000 2200 0000
  Plane 1   2200 2222 0000   2000 2200 0000
```



```
 Plane 2   2200 2222 0000   2000 2200 0000
 Plane 3   2200 2222 0000   2000 2200 0000
 Plane 4   3300 3333 0000   3000 3300 0000
 Plane 5   3300 3333 0000   3000 3300 0000
 Plane 6   3300 3333 0000   3000 3300 0000
 Plane 7   3300 3333 0000   3000 3300 0000
PFE 1
 Plane 0   2200 2222 0000   2000 2200 0000
 Plane 1   2200 2222 0000   2000 2200 0000
 Plane 2   2200 2222 0000   2000 2200 0000
 Plane 3   2200 2222 0000   2000 2200 0000
 Plane 4   3300 3333 0000   3000 3300 0000
 Plane 5   3300 3333 0000   3000 3300 0000
 Plane 6   3300 3333 0000   3000 3300 0000
 Plane 7   3300 3333 0000   3000 3300 0000
```

show chassis fabric destinations (MX960 Router)

```
user@host> show chassis fabric destinations

    Fabric destinations state:
       0: non-existent
       2: enabled
       3: disabled
       6: dest-err and disabled

    FPC 1
     PFE 0
      Plane 0   0000 3300 3333
      Plane 1   0000 2200 2222
      Plane 2   0000 2200 2222
      Plane 3   0000 2200 2222
      Plane 4   0000 2200 2222
      Plane 5   0000 3300 3333
      Plane 6   0000 3300 3333
      Plane 7   0000 3300 3333
     PFE 1
      Plane 0   0000 3300 3333
      Plane 1   0000 2200 2222
      Plane 2   0000 2200 2222
      Plane 3   0000 2200 2222
      Plane 4   0000 2200 2222
      Plane 5   0000 3300 3333
      Plane 6   0000 3300 3333
      Plane 7   0000 3300 3333
    FPC 2
     PFE 0
      Plane 0   0000 3300 3333
      Plane 1   0000 2200 2222
      Plane 2   0000 2200 2222
      Plane 3   0000 2200 2222
      Plane 4   0000 2200 2222
      Plane 5   0000 3300 3333
      Plane 6   0000 3300 3333
      Plane 7   0000 3300 3333
     PFE 1
      Plane 0   0000 3300 3333
      Plane 1   0000 2200 2222
      Plane 2   0000 2200 2222
      Plane 3   0000 2200 2222
      Plane 4   0000 2200 2222
```

```
    Plane 5   0000 3300 3333
    Plane 6   0000 3300 3333
    Plane 7   0000 3300 3333
   PFE 2
    Plane 0   0000 3300 3333
    Plane 1   0000 2200 2222
    Plane 2   0000 2200 2222
    Plane 3   0000 2200 2222
    Plane 4   0000 2200 2222
    Plane 5   0000 3300 3333
    Plane 6   0000 3300 3333
    Plane 7   0000 3300 3333
   PFE 3
    Plane 0   0000 3300 3333
    Plane 1   0000 2200 2222
    Plane 2   0000 2200 2222
    Plane 3   0000 2200 2222
    Plane 4   0000 2200 2222
    Plane 5   0000 3300 3333
    Plane 6   0000 3300 3333
    Plane 7   0000 3300 3333
```

show chassis fabric destinations fpc 1 (MX2020 Router)

```
user@host> show chassis fabric destinations fpc 1
Fabric destinations state:
   0: non-existent
   2: enabled
   3: disabled
   6: dest-err and disabled

FPC 1
 PFE 0
  Plane 0   3333 3333 3333   3333 3333 3333   3333 3333 3333   3333 3333 3333
3333 3333 3333   3333 3333 3333   3333 3333
  Plane 1   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 2   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 3   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 4   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 5   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 6   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 7   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
 PFE 1
  Plane 0   3333 3333 3333   3333 3333 3333   3333 3333 3333   3333 3333 3333
3333 3333 3333   3333 3333 3333   3333 3333
  Plane 1   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 2   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 3   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 4   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
```

```
  Plane 5   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 6   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 7   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
 PFE 2
  Plane 0   3333 3333 3333   3333 3333 3333   3333 3333 3333   3333 3333 3333
3333 3333 3333   3333 3333 3333   3333 3333
  Plane 1   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 2   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 3   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 4   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 5   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 6   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 7   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
 PFE 3
  Plane 0   3333 3333 3333   3333 3333 3333   3333 3333 3333   3333 3333 3333
3333 3333 3333   3333 3333 3333   3333 3333
  Plane 1   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 2   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 3   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 4   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 5   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 6   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 7   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
```

show chassis fabric destinations fpc 14 (MX2020 Router with MPC4E)

```
user@ host > show chassis fabric destinations fpc 14
Fabric destinations state:
   0: non-existent
   2: enabled
   3: disabled
   6: dest-err and disabled

FPC 14
 PFE 0
  Plane 0   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
 2200 0000 0000 0000 0000 2222
  Plane 1   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
 2200 0000 0000 0000 0000 2222
  Plane 2   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
 2200 0000 0000 0000 0000 2222
  Plane 3   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
 2200 0000 0000 0000 0000 2222
  Plane 4   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
```

```
2200 0000 0000 0000 0000 2222
 Plane 5   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
 Plane 6   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
 Plane 7   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
PFE 1
 Plane 0   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
 Plane 1   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
 Plane 2   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
 Plane 3   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
 Plane 4   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
 Plane 5   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
 Plane 6   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
 Plane 7   2200 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
```

show chassis fabric destinations (MX2010 Router)

```
user@host> show chassis fabric destinations
Fabric destinations state:
   0: non-existent
   2: enabled
   3: disabled
   6: dest-err and disabled

FPC 0
 PFE 0
  Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
  Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
 PFE 1
  Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
  Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
FPC 1
 PFE 0
  Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
  Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
```



```
  Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
FPC 2
 PFE 0
  Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
  Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
 PFE 1
  Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
  Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200

FPC 3
 PFE 0
  Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
  Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
 PFE 1
  Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
  Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
 PFE 2
  Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
  Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
 PFE 3
  Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
  Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
FPC 4
 PFE 0
```

```
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  FPC 5
   PFE 0
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
   PFE 1
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
  FPC 6
   PFE 0
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
   PFE 1
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
   PFE 2
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
   PFE 3
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000   3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000   2200
```

```
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
  FPC 7
   PFE 0
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000    3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
   PFE 1
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000    3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
  FPC 8
   PFE 0
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000    3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
  FPC 9
   PFE 0
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000    3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
   PFE 1
    Plane 0   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 1   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 2   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 3   3300 3000 3300   3333 3000 3300   3333 3300 3000    3300
    Plane 4   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 5   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 6   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
    Plane 7   2200 2000 2200   2222 2000 2200   2222 2200 2000    2200
```

show chassis fabric feb

Syntax show chassis fabric feb

Release Information Command introduced in Junos OS Release 8.0.

Description (M120 router only) Display the state of the electrical and optical switching fabric links between the Forwarding Engine Boards (FEBs) and the fabric planes, as interpreted by the FEB.

Options This command has no options.

Required Privilege Level view

List of Sample Output show chassis fabric feb on page 1015

Output Fields Table 69 on page 1015 lists the output fields for the **show chassis fabric feb** command.

Table 69: show chassis fabric feb Output Fields

Field Name	Field Description
Fabric management FEB state	State of the switching fabric link between each FEB and fabric plane: **desalination error**, **disabled**, **enabled**, **link error**, **link ok**, or **unused**.

Sample Output

show chassis fabric feb

```
user@host> show chassis fabric feb
Fabric management       FEB state
FEB 0                   Plane 0: Plane enabled
                        Plane 1: Plane enabled
                        Plane 2: Plane enabled
                        Plane 3: Plane enabled
FEB 4
                        Plane 0: Plane enabled
                        Plane 1: Plane enabled
                        Plane 2: Plane enabled
                        Plane 3: Plane enabled
```

show chassis fabric errors

List of Syntax

Syntax on page 1016
Syntax (PTX Series Packet Transport Routers) on page 1016

Syntax

show chassis fabric errors
<autoheal>
<fpc *slot-number* lcc *number*>
<sib (*slot* | f13 *sib-slot* | f2s *sib-slot/sib-f2s-slot-number* | lcc *number*)>

Syntax (PTX Series Packet Transport Routers)

show chassis fabric errors
(autoheal | fpc *slot-number* | sib *sib-slot*)

Release Information

Command introduced in Junos OS Release 10.0.
Command introduced in Junos OS Release 12.1X48 for the PTX Series Packet Transport Routers.

Description

Display the first ten and last ten fabric errors for the FPC or Switch Interface Boards (SIBs).

NOTE: This command can only be issued on a master Routing Engine.

Options

autoheal—(TX Matrix Plus routers and PTX Series Packet Transport Routers only) Show an error log of the first 100 autoheal actions taken on the system.

fpc *slot-number*—Show error log of the first ten and last ten errors for the specified FPC.

(PTX5000 Packet Transport Routers only)—Replace ***slot-number*** with a value from **0** through **7**.

(TX Matrix Plus routers only)—Replace **fpc *slot-number*** with the following values depending on the LCC configuration:

- On a TX Matrix Plus router with the TXP-T1600 configuration, if you specify the number of a T1600 LCC by using the **lcc** *number* option (the recommended method), replace **fpc *slot-number*** with a value from **0** through **7**. Otherwise, use a value from **0** through **31**.
- On a TX Matrix Plus router with the TXP-T1600-3D, TXP-T4000-3D, or TXP-Mixed-LCC-3D configuration, if you specify the number of a T1600 or T4000 LCC by using the **lcc *number*** option (the recommended method), replace **fpc *slot-number*** with a value from **0** through **7**. Otherwise, use a value from **0** through **63**.
- **lcc** *number*—Show error log of the first ten and last ten errors for the specified FPC on a specific network device (line-card chassis) that is part of the routing matrix.

Replace **lcc** *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

If you specify the number of the network device by using only the **lcc** *number* option (the recommended method), replace *slot-number* with a value from **0** through **7**. Otherwise, replace *slot-number* with a value from **0** through **31**. For example, the following commands have the same result:

```
user@host> show chassis fabric errors fpc 1 lcc 1
user@host> show chassis fabric errors fpc 9
```

sib—Show error log of the first ten and last ten errors for the specified SIB. This option has the following suboptions:

- (TX Matrix Plus routers only)*sib-slot*—Specify a value ranging from **0** through **4**.
- (PTX Series Packet Transport Routers) *sib-slot*—Specify a value ranging from **0** through **8**.
- **f13** ***sib-slot***—(Optional) Show SIB F13 errors. Specify a valid SIB value number: **0**, **1**, **3**, **4**, **6**, **7**, **8**, **9**, **11**, or **12**.
- **f2s** ***sib-slot/sib-f2s-slot-number***—(Optional) Show SIB F2S errors. Replace ***sib-slot*** with a value from **0** through **4**, followed by a ***sib-f2s-slot-number*** value **0**, **2**, **4** or **6**.
- **lcc** ***number***—(Optional) Show error log of the first ten and last ten SIB errors for the specified network device (line-card chassis).

  Replace *number* with the following values depending on the LCC configuration:

  - 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
  - 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
  - 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
  - 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

NOTE: The **lcc** ***number*** suboption is mandatory when using the following format for the command: **show chassis fabric errors sib lcc** ***number*** **sib** ***slot-number***. For instance, issuing **show chassis fabric errors sib lcc** ***2 3*** displays errors detected on LCC 2, SIB 3.

This suboption is not required when the **f13** or **f2s** suboptions are used with the **sib** ***slot-number*** option.

Required Privilege Level

view

List of Sample Output

show chassis fabric errors (F13 SIB Errors on a TX Matrix Plus Router) on page 1019
show chassis fabric errors (F2S SIB Errors on a TX Matrix Plus Router) on page 1019
show chassis fabric errors (SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router) on page 1019
show chassis fabric errors (FPC Errors Specific to an LCC Connected to a TX Matrix Plus Router) on page 1020
show chassis fabric errors (SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router with 3D SIBs) on page 1020
show chassis fabric errors fpc or sib (PTX Series Packet Transport Routers) on page 1020
show chassis fabric errors autoheal (PTX Series Packet Transport Routers) on page 1020
show chassis fabric errors autoheal (TX Matrix Plus Router with 3D SIBs) on page 1020

Output Fields

Table 70 on page 1018 lists the output fields for the **show chassis fabric errors** command. Output fields are listed in the approximate order in which they appear.

Table 70: show chassis fabric errors Output Fields

Field Name	Field Description
Time	Time the error was logged. (TX Matrix Plus routers and PTX Series Packet Transport Routers only) For the **autoheal** option, shows the timestamp when autoheal was attempted on a SIB that was in fault state.
Error log of first 10 errors	List of the first ten errors.
Error log of last 10 errors	List of the last ten errors.

Table 70: show chassis fabric errors Output Fields *(continued)*

Field Name	Field Description
Error log of first 100 errors	Indicates the autoheal action taken on the SIB. The following actions can occur: • Req—A SIB autoheal request was made on a faulty SIB. • Action—Autohealing (taking the SIB offline and then online) is initiated. • Denied—Autohealing (taking the SIB offline and then online) is denied because the SIB went to a fault state before the autoheal configuration period completed. • Set info—Setting information to force skipping autoheal on the SIB so that no further attempts to autoheal the faulty SIB are made. • Clear info— if a user takes a SIB offline and then online, then the autoheal information of the SIB is cleared. If the SIB goes to a fault state, autoheal is attempted on the SIB.
fpc slot number	(PTX5000 Packet Transport Router only)—Range is 0 through 7.
sib slot number	(PTX Series Packet Transport Routers only)—Range is 0 through 8.
lcc number	Not supported on PTX Series Packet Transport Routers.

Sample Output

show chassis fabric errors (F13 SIB Errors on a TX Matrix Plus Router)

```
user@host> show chassis fabric errors sib f13 11

Time                          Error log of first 10 errors
2009-10-06 02:21:17 PDT       LOS on Cable-D(1,0)
```

show chassis fabric errors (F2S SIB Errors on a TX Matrix Plus Router)

```
user@host> show chassis fabric errors sib f2s 0/0

Time                          Error log of first 10 errors
2009-10-06 13:51:42 PDT       Cell drop errors on CLOS F2 SF 0 Port 0 link
```

show chassis fabric errors (SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router)

```
user@host> show chassis fabric errors sib 1 lcc 0
lcc0-re0:

---------------------------------------------------------------------------

Time                          Error log of first 10 errors

2009-10-06 02:23:16 PDT       Cell drop errors on FPC7_T link

2009-10-06 02:23:16 PDT       Cell drop errors on FPC7_B link
```

show chassis fabric errors (FPC Errors Specific to an LCC Connected to a TX Matrix Plus Router)

```
user@host> show chassis fabric errors fpc 5 lcc 0
lcc0-re0:

--------------------------------------------------------------------------

Time                          Error log of first 10 errors

2009-10-06 13:56:59 PDT       PFE_T has link error on plane 1
```

show chassis fabric errors (SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric errors sib 1 lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Time                          Error log of first 10 errors
2013-02-11 04:46:42 PST       CRC errors on XC link SIB01_XF3#11,0
```

show chassis fabric errors fpc or sib (PTX Series Packet Transport Routers)

```
user@host> show chassis fabric errors fpc 1
Time                          Error log of first 10 errors
2012-01-06 16:27:03 PST       Link errs on PFE 2, SIB 0, Plane 0

user@host> show chassis fabric errors sib 1
Time                          Error log of first 10 errors
2012-01-06 15:34:33 PST       Link errs on PFE 0, FPC 0, Plane 2
```

show chassis fabric errors autoheal (PTX Series Packet Transport Routers)

```
user@host> show chassis fabric errors autoheal
```

show chassis fabric errors autoheal (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric errors autoheal
Time                       Error log of first 100 errors
2013-03-25 00:16:10 PDT    Req: Plane 3 F13 8 Cbl 4 (tx) LCC0-SIB3 Cbl 4 (rx)
2013-03-25 00:16:12 PDT    Action: Plane 3 F13 8 Cbl 4 (autohealing)
2013-03-25 00:17:24 PDT    Req: Plane 3 F13 8 Cbl 4 (tx) LCC0-SIB3 Cbl 4 (rx)
2013-03-25 00:17:24 PDT    Denied: Plane 3 F13 8 Cbl 4 (time < configured)
2013-03-25 00:17:24 PDT    Set info: Plane 3 F13 8 Cbl 4 (skip autoheal)
2013-03-25 01:20:17 PDT    Clear info: Plane 3
```


show chassis fabric fpcs

List of Syntax

Syntax on page 1021
Syntax (MX Series Routers) on page 1021
Syntax (MX2010 and MX2020 3D Universal Edge Routers) on page 1021
Syntax (T4000 Core Router) on page 1021
Syntax (PTX Series Packet Transport Routers) on page 1021
Syntax (TX Matrix Plus Router) on page 1021

Syntax

```
show chassis fabric fpcs
<lcc number>
```

Syntax (MX Series Routers)

```
show chassis fabric fpcs
<all-members>
<local>
<member member-id>
```

Syntax (MX2010 and MX2020 3D Universal Edge Routers)

```
show chassis fabric fpcs
```

Syntax (T4000 Core Router)

```
show chassis fabric fpcs
```

Syntax (PTX Series Packet Transport Routers)

```
show chassis fabric fpcs <slot fpc-slot>
```

Syntax (TX Matrix Plus Router)

```
show chassis fabric fpcs
<lcc number>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.4 for EX Series switches.
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

(M320, MX Series, and T Series routers, EX8200 switches, and PTX Series Packet Transport Routers only) Display the state of the electrical switch fabric links between the Flexible PIC Concentrators (FPCs) and the Switch Interface Boards (SIBs).

Options

none—Display the switch fabric link state. On a TX Matrix router, display the switching fabric link states for the FPCs in all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display the switching fabric link states for the FPCs in all 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 router and TX Matrix Plus router only) (Optional) On a TX Matrix router, display the switch fabric link state for the FPCs in the specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the switch fabric link state for the FPCs in the specified router (line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a following value depending on the LCC configurations:

- From **0** through **3** on a T640 router on the routing matrix with TX Matirx routers.
- From **0** through **3** on a T1600 router on the routing matrix with TX Matirx Plus routers.
- From **0** through **7** on a T1600 router in a routing matrix with TX Matrix Plus router with 3D SIBs.
- **0**, **2**, **4**, **6** on a T4000 router in a routing matrix with TX Matrix Plus router with 3D SIBs.

local—(MX Series routers only) (Optional) Display the switching fabric link states for the FPCs in the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display the switching fabric link states for the FPCs in the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

slot *fpc-slot*—(PTX Series Packet Transport Routers only) (Optional) Display the fabric state of the specified FPC slot. If no value is provided, display the status of all FPCs.

Required Privilege Level

view

Related Documentation

- request chassis fabric fpc on page 623
- show chassis fpc on page 1212

- *Displaying Information About DPCs or FPCs in an MX Series Router*

List of Sample Output

show chassis fabric fpcs (T4000 Core Router) on page 1047
show chassis fabric fpcs (TX Matrix Plus Router) on page 1048
show chassis fabric fpcs lcc (TX Matrix Plus Router) on page 1056
show chassis fabric fpcs (EX8200 Switch) on page 1056
show chassis fabric fpcs (PTX3000 Router) on page 1057

Output Fields Table 71 on page 1024 lists the output fields for the **show chassis fabric fpcs** command. Output fields are listed in the approximate order in which they appear.

Table 71: show chassis fabric fpcs Output Fields

<table>
<tr><th>Field Name</th><th>Field Description</th></tr>
<tr><td>Fabric management FPC state</td><td>Switching fabric link (link from SIB to FPC) state for each FPC:
Unused—FPC is not present.
(On MX240 and MX480 routers with AS- MLC modular carrier card or MPC4E only) the fabric plane from the pair that share physical links (1 and 5, and 3 and 7) is inactive.
Destination error on PFEs list of PFE numbers—Destination errors to the listed Packet Forwarding Engines. Indicates that the link is not carrying traffic to the listed Packet Forwarding Engines.
NOTE: In Junos OS Release 9.6 and later, the list of Packet Forwarding Engines with destination errors is displayed in the output.
In Junos OS Releases before 9.6, the output only indicates that there are destination errors. However, the list of Packet Forwarding Engines with destination errors is not displayed.
Links ok—Link between the spare SIB and FPC is eligible to carry traffic.
Link error—Link between the SIB and FPC has CRC errors. However, the link is still eligible to carry traffic.
Plane disabled—Fabric plane has been disabled for the following reasons:
Destination errors have exceeded the thresholds.
Run-time link errors have exceeded the thresholds.
Initialization time link errors detected, and link training was unsuccessful.
Plane Disabled, Links Error (PTX Series Packet Transport Routers only)—The plane is disabled because of link errors detected at the FPC RX.
Plane Disabled, Links Down (PTX Series Packet Transport Routers only)—The plane is disabled because of link errors detected at the SIB RX.
Plane enabled—Link between the active SIB and FPC is eligible to carry traffic.
NOTE: On the Enhanced MX SCB with MPC, a maximum of 4 planes are operational and running. On all the other SCBs with MPC, all the planes are operational and running.
Plane Enabled, Links OK (PTX Series Packet Transport Routers only)—The FPC CCL RX link is eligible to carry traffic.
Plane Enabled, Links OK (TX Matrix and TX Matrix Plus routers only)—The FPC HSL RX link is eligible to carry traffic.</td></tr>
</table>

Sample Output

show chassis fabric fpcs (M320 Router)

```
user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC #2
```

```
  PFE #1
    SIB #0
             Plane enabled
    SIB #1
             Plane enabled
    SIB #2
             Plane enabled
    SIB #3
             Plane enabled
```

show chassis fabric fpcs (MX240 Router)

```
user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC 2
  PFE #0
       Plane 0: Plane enabled
       Plane 1: Plane enabled
       Plane 2: Plane enabled
       Plane 3: Plane enabled
       Plane 4: Links ok
       Plane 5: Links ok
       Plane 6: Links ok
       Plane 7: Links ok
  PFE #1
       Plane 0: Plane enabled
       Plane 1: Plane enabled
       Plane 2: Plane enabled
       Plane 3: Plane enabled
       Plane 4: Links ok
       Plane 5: Links ok
       Plane 6: Links ok
       Plane 7: Links ok
  PFE #2
       Plane 0: Plane enabled
       Plane 1: Plane enabled
       Plane 2: Plane enabled
       Plane 3: Plane enabled
       Plane 4: Links ok
       Plane 5: Links ok
       Plane 6: Links ok
       Plane 7: Links ok
  PFE #3
       Plane 0: Plane enabled
       Plane 1: Plane enabled
       Plane 2: Plane enabled
       Plane 3: Plane enabled
       Plane 4: Links ok
       Plane 5: Links ok
       Plane 6: Links ok
       Plane 7: Links ok
```

show chassis fabric fpcs (MX480 Router)

```
user@host> show chassis fabric fpcs

FPC 0
  PFE #0
       Plane 0: Plane enabled
       Plane 1: Plane enabled
       Plane 2: Plane enabled
```



```
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
  PFE #1
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
  PFE #2
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
  PFE #3
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
FPC 1
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
  PFE #1
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
```

show chassis fabric fpcs (MX960 Router)

```
user@host> show chassis fabric fpcs
FPC 0
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
```



```
        Plane 4: Links ok
        Plane 5: Links ok
  PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
  PFE #2
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
  PFE #3
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
FPC 1
  PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
  PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
FPC 2
  PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
  PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
  PFE #2
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
...
```

show chassis fabric fpcs (MX240 with AS MLC Modular Carrier Card)

In the following output, FPC 1 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric fpcs
FPC 1
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Unused
      Plane 6: Plane enabled
      Plane 7: Unused
FPC 2
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
```

show chassis fabric fpcs (MX480 with AS MLC Modular Carrier Card)

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric fpcs
FPC 2
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
FPC 4
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
  PFE #2
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
FPC 5
```

```
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Unused
      Plane 6: Plane enabled
      Plane 7: Unused
```

show chassis fabric fpcs (MX480 Router with MPC4E)

In the following output, **FPC4** is the MPC4E (MPC4E-3D-32XGE-SFPP) card.

```
user@host > show chassis fabric fpcs
Fabric management FPC state:
FPC 0
  PFE #0
      Plane 0: Links ok
      Plane 1: Links ok
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Links ok
      Plane 6: Plane enabled
      Plane 7: Links ok
  PFE #1
      Plane 0: Links ok
      Plane 1: Links ok
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Links ok
      Plane 6: Plane enabled
      Plane 7: Links ok
FPC 1
  PFE #0
      Plane 0: Links ok
      Plane 1: Links ok
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Links ok
      Plane 6: Plane enabled
      Plane 7: Links ok
  PFE #1
      Plane 0: Links ok
      Plane 1: Links ok
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Links ok
      Plane 6: Plane enabled
      Plane 7: Links ok
  PFE #2
      Plane 0: Links ok
      Plane 1: Links ok
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Links ok
```

```
      Plane 6: Plane enabled
      Plane 7: Links ok
  PFE #3
      Plane 0: Links ok
      Plane 1: Links ok
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Links ok
      Plane 6: Plane enabled

FPC 3
  PFE #0
      Plane 0: Links ok
      Plane 1: Links ok
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Links ok
      Plane 6: Plane enabled
      Plane 7: Links ok
FPC 4
  PFE #0
      Plane 0: Links ok
      Plane 1: Links ok
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Unused
      Plane 6: Plane enabled
      Plane 7: Unused
  PFE #1
      Plane 0: Links ok
      Plane 1: Links ok
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Unused
      Plane 6: Plane enabled
      Plane 7: Unused
```

show chassis fabric fpcs (MX960 with AS MLC Modular Carrier Card

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

```
user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC 0
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
  PFE #1
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
```

```
        Plane 5: Links ok
  FPC 1
    PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
  FPC 4
    PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
    PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
    PFE #2
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
    PFE #3
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
  FPC 5
    PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
  FPC 8
    PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
    PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
```



```
  PFE #2
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
  PFE #3
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
```

show chassis fabric fpcs (MX2010 Router)

```
user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC 0
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
  PFE #1
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
FPC 1
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
FPC 2
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
  PFE #1
      Plane 0: Plane enabled
      Plane 1: Plane enabled
```

```
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
FPC 3
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
 Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
  PFE #1
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
  PFE #2
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
  PFE #3
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
FPC 4
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
FPC 5
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane disabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
```

```
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane disabled
        Plane 4: Plane enabled
  Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
  FPC 6
    PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane disabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane disabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #2
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane disabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #3
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane disabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
  FPC 7
    PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane disabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
```



```
        Plane 2: Plane enabled
        Plane 3: Plane disabled
        Plane 4: Plane enabled
   Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
FPC 8
  PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane disabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
FPC 9
  PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane disabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
  PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane disabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
```

show chassis fabric fpcs (MX2020 Router)

```
user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC 0
  PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
  PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
  PFE #2
        Plane 0: Plane enabled
```



```
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #3
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
  FPC 1
    PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #2
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #3
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
  FPC 2
    PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
```



```
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #2
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #3
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
  FPC 3
    PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #2
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
    PFE #3
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
```

```
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
FPC 4
...
```

show chassis fabric fpcs (MX2020 Router with MPC4E)

```
user@host > show chassis fabric fpcs
Fabric management FPC state:
FPC 0
  PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
  PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
FPC 9
  PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
  PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
FPC 10
  PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Plane enabled
        Plane 5: Plane enabled
        Plane 6: Plane enabled
        Plane 7: Plane enabled
FPC 14
```

```
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
  PFE #1
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
FPC 19
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
  PFE #1
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
  PFE #2
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
  PFE #3
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Plane enabled
      Plane 5: Plane enabled
      Plane 6: Plane enabled
      Plane 7: Plane enabled
```

show chassis fabric fpcs (T320 Router)

```
user@host> show chassis fabric fpcs
FPC #3
  PFE #1
```

```
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
FPC #5
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
FPC #7
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
```

show chassis fabric fpcs (T640 Router)

```
user@host> show chassis fabric fpcs
Fabric management FPC state:

FPC #2
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
FPC #3
  PFE #1
    SIB #2
           Plane enabled
    SIB #3
           Link error
           Destination error on PFEs       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 (TX Matrix Router with 3D SIBs)

```
user@host> show chassis fabric fpcs
lcc0-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #0
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #3
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #4
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
```

```
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #5
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #6
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
```

```
    SIB #4
            Links ok

lcc2-re0:
--------------------------------------------------------------------------

lcc4-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #2
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #3
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok

lcc6-re0:
--------------------------------------------------------------------------
```


show chassis fabric fpcs lcc (TX Matrix Router with 3D SIBs)

```
user@host> show chassis fabric fpcs lcc 4
lcc4-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #2
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #3
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
```

show chassis fabric fpcs (T1600 Router)

```
user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC #0
  PFE #0
    SIB #0
            Links ok
```



```
      SIB #1
              Plane enabled
      SIB #2
              Plane enabled
      SIB #3
              Plane enabled
      SIB #4
              Plane enabled
    PFE #1
      SIB #0
              Links ok
      SIB #1
              Plane enabled
      SIB #2
              Plane enabled
      SIB #3
              Plane enabled
      SIB #4
              Plane enabled
  FPC #1
    PFE #0
      SIB #0
              Links ok
      SIB #1
              Plane enabled
      SIB #2
              Plane enabled
      SIB #3
              Plane enabled
      SIB #4
              Plane enabled
    PFE #1
      SIB #0
              Links ok
      SIB #1
              Plane enabled
      SIB #2
              Plane enabled
      SIB #3
              Plane enabled
      SIB #4
              Plane enabled
  FPC #2
    PFE #0
      SIB #0
              Links ok
      SIB #1
              Plane enabled
      SIB #2
              Plane enabled
      SIB #3
              Plane enabled
      SIB #4
              Plane enabled
  FPC #4
    PFE #0
      SIB #0
              Links ok
      SIB #1
              Plane enabled
      SIB #2
```



```
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
FPC #3
  PFE #1
    SIB #2
           Plane enabled
    SIB #3
           Link error
           Destination error on PFEs       0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
    SIB #4
           Destination error on PFEs       0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
```

show chassis fabric fpcs (T4000 Core Router)

```
Fabric management FPC state:
FPC #2
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
FPC #3
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
FPC #5
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Plane enabled
```



```
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
FPC #6
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
```

show chassis fabric fpcs (TX Matrix Plus Router)

```
user@host> show chassis fabric fpcs
lcc0-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #0
  PFE #1
    SIB #0
            Unused
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #2
  PFE #0
```



```
    SIB #0
            Unused
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Unused
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #3
  PFE #1
    SIB #2
           Plane enabled
    SIB #3
           Link error
           Destination error on PFEs       0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
    SIB #4
           Destination error on PFEs       0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
FPC #4
  PFE #0
    SIB #0
            Unused
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Unused
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #6
  PFE #0
    SIB #0
            Unused
    SIB #1
            Links ok
```

```
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Unused
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #7
  PFE #0
    SIB #0
            Unused
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok

lcc1-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #2
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #4
  PFE #0
    SIB #0
            Links ok
    SIB #1
```



```
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Destination error on PFEs       1    8    9   29   40   65   72   73

             93  104
    SIB #4
            Links ok
FPC #6
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #7
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok

lcc2-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #0
  PFE #0
```

```
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
      PFE #1
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
    FPC #2
      PFE #0
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
      PFE #1
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
    FPC #4
      PFE #0
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
    FPC #5
      PFE #0
        SIB #0
                Links ok
        SIB #1
```



```
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #6
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #7
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok

lcc3-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #0
  PFE #0
    SIB #0
            Links ok
```

```
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
      PFE #1
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
    FPC #2
      PFE #0
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
      PFE #1
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
    FPC #4
      PFE #0
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
      PFE #1
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
```



```
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #5
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #6
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #7
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
```

```
    SIB #4
            Links ok
```

show chassis fabric fpcs lcc (TX Matrix Plus Router)

```
user@host> show chassis fabric fpcs lcc 0
lcc0-re1:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #3
  PFE #1
    SIB #2
           Plane enabled
    SIB #3
           Link error
           Destination error on PFEs      0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
    SIB #4
           Destination error on PFEs      0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
FPC #4
  PFE #0
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
  PFE #1
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
FPC #6
  PFE #0
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
  PFE #1
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
FPC #7
  PFE #0
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
```

show chassis fabric fpcs (EX8200 Switch)

```
user@host> show chassis fabric fpcs
Fabric management FPC state
FPC 6
  PFE #0
      Plane 0: Plane enabled
```

```
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
        Plane 6: Links ok
        Plane 7: Links ok
        Plane 8: Plane enabled
        Plane 9: Plane enabled
        Plane 10: Plane enabled
        Plane 11: Plane enabled
    PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
        Plane 6: Links ok
        Plane 7: Links ok
        Plane 8: Plane enabled
        Plane 9: Plane enabled
        Plane 10: Plane enabled
        Plane 11: Plane enabled
FPC 7
    PFE #0
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
        Plane 6: Links ok
        Plane 7: Links ok
        Plane 8: Plane enabled
        Plane 9: Plane enabled
        Plane 10: Plane enabled
        Plane 11: Plane enabled
    PFE #1
        Plane 0: Plane enabled
        Plane 1: Plane enabled
        Plane 2: Plane enabled
        Plane 3: Plane enabled
        Plane 4: Links ok
        Plane 5: Links ok
        Plane 6: Links ok
        Plane 7: Links ok
        Plane 8: Plane enabled
        Plane 9: Plane enabled
        Plane 10: Plane enabled
        Plane 11: Plane enabled
```

show chassis fabric fpcs (PTX3000 Router)

```
user@host> show chassis fabric fpcs slot 8
Fabric management FPC state:
FPC #8
    PFE #0
        SIB0_Fcore0 (plane  0)   Plane Enabled, Links OK
        SIB0_Fcore1 (plane  1)   Plane Enabled, Links OK
        SIB1_Fcore0 (plane  2)   Plane Enabled, Links OK
```

```
        SIB1_Fcore1 (plane  3)   Plane Enabled, Links OK
        SIB2_Fcore0 (plane  4)   Plane Enabled, Links OK
        SIB2_Fcore1 (plane  5)   Plane Enabled, Links OK
        SIB3_Fcore0 (plane  6)   Plane Enabled, Links OK
        SIB3_Fcore1 (plane  7)   Plane Enabled, Links OK
        SIB4_Fcore0 (plane  8)   Plane Enabled, Links OK
        SIB4_Fcore1 (plane  9)   Plane Enabled, Links OK
        SIB5_Fcore0 (plane 10)   Plane Enabled, Links OK
        SIB5_Fcore1 (plane 11)   Plane Enabled, Links OK
        SIB6_Fcore0 (plane 12)   Plane Enabled, Links OK
        SIB6_Fcore1 (plane 13)   Plane Enabled, Links OK
        SIB7_Fcore0 (plane 14)   Plane Enabled, Links OK
        SIB7_Fcore1 (plane 15)   Plane Enabled, Links OK
        SIB8_Fcore0 (plane 16)   Plane Enabled, Links OK
        SIB8_Fcore1 (plane 17)   Plane Enabled, Links OK
    PFE #1
        SIB0_Fcore0 (plane  0)   Plane Enabled, Links OK
        SIB0_Fcore1 (plane  1)   Plane Enabled, Links OK
        SIB1_Fcore0 (plane  2)   Plane Enabled, Links OK
        SIB1_Fcore1 (plane  3)   Plane Enabled, Links OK
        SIB2_Fcore0 (plane  4)   Plane Enabled, Links OK
        SIB2_Fcore1 (plane  5)   Plane Enabled, Links OK
        SIB3_Fcore0 (plane  6)   Plane Enabled, Links OK
        SIB3_Fcore1 (plane  7)   Plane Enabled, Links OK
        SIB4_Fcore0 (plane  8)   Plane Enabled, Links OK
        SIB4_Fcore1 (plane  9)   Plane Enabled, Links OK
        SIB5_Fcore0 (plane 10)   Plane Enabled, Links OK
        SIB5_Fcore1 (plane 11)   Plane Enabled, Links OK
        SIB6_Fcore0 (plane 12)   Plane Enabled, Links OK
        SIB6_Fcore1 (plane 13)   Plane Enabled, Links OK
        SIB7_Fcore0 (plane 14)   Plane Enabled, Links OK
        SIB7_Fcore1 (plane 15)   Plane Enabled, Links OK
        SIB8_Fcore0 (plane 16)   Plane Enabled, Links OK
        SIB8_Fcore1 (plane 17)   Plane Enabled, Links OK
```


show chassis fabric map

List of Syntax

Syntax on page 1059
Syntax (MX Series Router) on page 1059

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 1060
show chassis fabric map (MX Series Routers) on page 1060
show chassis fabric map plane 1 (EX8200 Switch) on page 1064

Output Fields Table 72 on page 1060 lists the output fields for the **show chassis fabric map** command. Output fields are listed in the approximate order in which they appear.

Table 72: show chassis fabric map Output Fields

Field Name	Field Description
in-links	Fabric map for receive side links.
out-links	Fabric map for transmit side links.

state	State of the fabric link:
	• **RESET**—Link between SIB and FPC/DPC is powered down on purpose. This is done in all non-dual PFE based boards.
	• **UP**—Link between SIB and FPC/DPC is up and running.
	• **DOWN**—Link between SIB and FPC/DPC is powered down.
	• **FAULT**—SIB is in alarmed state where the SIB's plane is not operational for the following reasons:
	  ◦ On-board F-chip is not operational.
	  ◦ Fiber optic connector faults.
	  ◦ FPC connector faults.
	  ◦ SIB midplane connector faults.

Sample Output

show chassis fabric map (M120 Router)

```
user@host> show chassis fabric map
FEB0->CB0F0_00 up CB0F0_08->FEB7 Down

FEB1->CB0F0_01 Down CB0F0_09->FEB6 Down

FEB6->CB0F0_02 Down CB0F0_10->FEB1 Down

FEB2->CB0F0_03 Down CB0F0_11->FEB0 up

FEB3->CB0F0_04 Down CB0F0_12->FEB3 Down

FEB4->CB0F0_05 up CB0F0_13->FEB2 Down

FEB7->CB0F0_06 Down CB0F0_14->FEB5 Down

FEB5->CB0F0_07 Down CB0F0_15->FEB4 up:
```

show chassis fabric map (MX Series Routers)

```
user@host> show chassis fabric map
```

```
DPC4PFE0->CB0F0_00_0      up       CB0F0_00_0->DPC4PFE0      up
DPC4PFE1->CB0F0_00_1      up       CB0F0_00_1->DPC4PFE1      up
DPC4PFE2->CB0F0_00_2      up       CB0F0_00_2->DPC4PFE2      up
DPC4PFE3->CB0F0_00_3      up       CB0F0_00_3->DPC4PFE3      up
DPC7PFE0->CB0F0_01_0      Down     CB0F0_01_0->DPC7PFE0      Down
DPC7PFE1->CB0F0_01_1      Down     CB0F0_01_1->DPC7PFE1      Down
DPC7PFE2->CB0F0_01_2      Down     CB0F0_01_2->DPC7PFE2      Down
DPC7PFE3->CB0F0_01_3      Down     CB0F0_01_3->DPC7PFE3      Down
DPC3PFE0->CB0F0_03_0      Down     CB0F0_03_0->DPC3PFE0      Down
DPC3PFE1->CB0F0_03_1      Down     CB0F0_03_1->DPC3PFE1      Down
DPC3PFE2->CB0F0_03_2      Down     CB0F0_03_2->DPC3PFE2      Down
DPC3PFE3->CB0F0_03_3      Down     CB0F0_03_3->DPC3PFE3      Down
DPC8PFE0->CB0F0_05_0      Down     CB0F0_05_0->DPC8PFE0      Down
DPC8PFE1->CB0F0_05_1      Down     CB0F0_05_1->DPC8PFE1      Down
DPC8PFE2->CB0F0_05_2      Down     CB0F0_05_2->DPC8PFE2      Down
DPC8PFE3->CB0F0_05_3      Down     CB0F0_05_3->DPC8PFE3      Down
DPC1PFE0->CB0F0_06_0      Down     CB0F0_06_0->DPC1PFE0      Down
DPC1PFE1->CB0F0_06_1      Down     CB0F0_06_1->DPC1PFE1      Down
DPC1PFE2->CB0F0_06_2      Down     CB0F0_06_2->DPC1PFE2      Down
DPC1PFE3->CB0F0_06_3      Down     CB0F0_06_3->DPC1PFE3      Down
DPC10PFE0->CB0F0_07_0     Down     CB0F0_07_0->DPC10PFE0     Down
DPC10PFE1->CB0F0_07_1     Down     CB0F0_07_1->DPC10PFE1     Down
DPC10PFE2->CB0F0_07_2     Down     CB0F0_07_2->DPC10PFE2     Down
DPC10PFE3->CB0F0_07_3     Down     CB0F0_07_3->DPC10PFE3     Down
DPC11PFE0->CB0F0_08_0     Down     CB0F0_08_0->DPC11PFE0     Down
DPC11PFE1->CB0F0_08_1     Down     CB0F0_08_1->DPC11PFE1     Down
DPC11PFE2->CB0F0_08_2     Down     CB0F0_08_2->DPC11PFE2     Down
DPC11PFE3->CB0F0_08_3     Down     CB0F0_08_3->DPC11PFE3     Down
DPC0PFE0->CB0F0_09_0      Down     CB0F0_09_0->DPC0PFE0      Down
DPC0PFE1->CB0F0_09_1      Down     CB0F0_09_1->DPC0PFE1      Down
DPC0PFE2->CB0F0_09_2      Down     CB0F0_09_2->DPC0PFE2      Down
DPC0PFE3->CB0F0_09_3      Down     CB0F0_09_3->DPC0PFE3      Down
DPC9PFE0->CB0F0_11_0      Down     CB0F0_11_0->DPC9PFE0      Down
DPC9PFE1->CB0F0_11_1      Down     CB0F0_11_1->DPC9PFE1      Down
DPC9PFE2->CB0F0_11_2      Down     CB0F0_11_2->DPC9PFE2      Down
DPC9PFE3->CB0F0_11_3      Down     CB0F0_11_3->DPC9PFE3      Down
DPC2PFE0->CB0F0_13_0      up       CB0F0_13_0->DPC2PFE0      up
DPC2PFE1->CB0F0_13_1      up       CB0F0_13_1->DPC2PFE1      up
DPC2PFE2->CB0F0_13_2      up       CB0F0_13_2->DPC2PFE2      up
DPC2PFE3->CB0F0_13_3      up       CB0F0_13_3->DPC2PFE3      up
DPC6PFE0->CB0F0_14_0      Down     CB0F0_14_0->DPC6PFE0      Down
DPC6PFE1->CB0F0_14_1      Down     CB0F0_14_1->DPC6PFE1      Down
DPC6PFE2->CB0F0_14_2      Down     CB0F0_14_2->DPC6PFE2      Down
DPC6PFE3->CB0F0_14_3      Down     CB0F0_14_3->DPC6PFE3      Down
DPC5PFE0->CB0F0_15_0      Down     CB0F0_15_0->DPC5PFE0      Down
DPC5PFE1->CB0F0_15_1      Down     CB0F0_15_1->DPC5PFE1      Down
DPC5PFE2->CB0F0_15_2      Down     CB0F0_15_2->DPC5PFE2      Down
DPC5PFE3->CB0F0_15_3      Down     CB0F0_15_3->DPC5PFE3      Down
DPC4PFE0->CB0F1_00_0      up       CB0F1_00_0->DPC4PFE0      up
DPC4PFE1->CB0F1_00_1      up       CB0F1_00_1->DPC4PFE1      up
DPC4PFE2->CB0F1_00_2      up       CB0F1_00_2->DPC4PFE2      up
DPC4PFE3->CB0F1_00_3      up       CB0F1_00_3->DPC4PFE3      up
DPC7PFE0->CB0F1_01_0      Down     CB0F1_01_0->DPC7PFE0      Down
DPC7PFE1->CB0F1_01_1      Down     CB0F1_01_1->DPC7PFE1      Down
DPC7PFE2->CB0F1_01_2      Down     CB0F1_01_2->DPC7PFE2      Down
DPC7PFE3->CB0F1_01_3      Down     CB0F1_01_3->DPC7PFE3      Down
DPC3PFE0->CB0F1_03_0      Down     CB0F1_03_0->DPC3PFE0      Down
DPC3PFE1->CB0F1_03_1      Down     CB0F1_03_1->DPC3PFE1      Down
DPC3PFE2->CB0F1_03_2      Down     CB0F1_03_2->DPC3PFE2      Down
DPC3PFE3->CB0F1_03_3      Down     CB0F1_03_3->DPC3PFE3      Down
DPC8PFE0->CB0F1_05_0      Down     CB0F1_05_0->DPC8PFE0      Down
```

```
DPC8PFE1->CB0F1_05_1      Down        CB0F1_05_1->DPC8PFE1      Down
DPC8PFE2->CB0F1_05_2      Down        CB0F1_05_2->DPC8PFE2      Down
DPC8PFE3->CB0F1_05_3      Down        CB0F1_05_3->DPC8PFE3      Down
DPC1PFE0->CB0F1_06_0      Down        CB0F1_06_0->DPC1PFE0      Down
DPC1PFE1->CB0F1_06_1      Down        CB0F1_06_1->DPC1PFE1      Down
DPC1PFE2->CB0F1_06_2      Down        CB0F1_06_2->DPC1PFE2      Down
DPC1PFE3->CB0F1_06_3      Down        CB0F1_06_3->DPC1PFE3      Down
DPC10PFE0->CB0F1_07_0     Down        CB0F1_07_0->DPC10PFE0     Down
DPC10PFE1->CB0F1_07_1     Down        CB0F1_07_1->DPC10PFE1     Down
DPC10PFE2->CB0F1_07_2     Down        CB0F1_07_2->DPC10PFE2     Down
DPC10PFE3->CB0F1_07_3     Down        CB0F1_07_3->DPC10PFE3     Down
DPC11PFE0->CB0F1_08_0     Down        CB0F1_08_0->DPC11PFE0     Down
DPC11PFE1->CB0F1_08_1     Down        CB0F1_08_1->DPC11PFE1     Down
DPC11PFE2->CB0F1_08_2     Down        CB0F1_08_2->DPC11PFE2     Down
DPC11PFE3->CB0F1_08_3     Down        CB0F1_08_3->DPC11PFE3     Down
DPC0PFE0->CB0F1_09_0      Down        CB0F1_09_0->DPC0PFE0      Down
DPC0PFE1->CB0F1_09_1      Down        CB0F1_09_1->DPC0PFE1      Down
DPC0PFE2->CB0F1_09_2      Down        CB0F1_09_2->DPC0PFE2      Down
DPC0PFE3->CB0F1_09_3      Down        CB0F1_09_3->DPC0PFE3      Down
DPC9PFE0->CB0F1_11_0      Down        CB0F1_11_0->DPC9PFE0      Down
DPC9PFE1->CB0F1_11_1      Down        CB0F1_11_1->DPC9PFE1      Down
DPC9PFE2->CB0F1_11_2      Down        CB0F1_11_2->DPC9PFE2      Down
DPC9PFE3->CB0F1_11_3      Down        CB0F1_11_3->DPC9PFE3      Down
DPC2PFE0->CB0F1_13_0      up          CB0F1_13_0->DPC2PFE0      up
DPC2PFE1->CB0F1_13_1      up          CB0F1_13_1->DPC2PFE1      up
DPC2PFE2->CB0F1_13_2      up          CB0F1_13_2->DPC2PFE2      up
DPC2PFE3->CB0F1_13_3      up          CB0F1_13_3->DPC2PFE3      up
DPC6PFE0->CB0F1_14_0      Down        CB0F1_14_0->DPC6PFE0      Down
DPC6PFE1->CB0F1_14_1      Down        CB0F1_14_1->DPC6PFE1      Down
DPC6PFE2->CB0F1_14_2      Down        CB0F1_14_2->DPC6PFE2      Down
DPC6PFE3->CB0F1_14_3      Down        CB0F1_14_3->DPC6PFE3      Down
DPC5PFE0->CB0F1_15_0      Down        CB0F1_15_0->DPC5PFE0      Down
DPC5PFE1->CB0F1_15_1      Down        CB0F1_15_1->DPC5PFE1      Down
DPC5PFE2->CB0F1_15_2      Down        CB0F1_15_2->DPC5PFE2      Down
DPC5PFE3->CB0F1_15_3      Down        CB0F1_15_3->DPC5PFE3      Down
DPC4PFE0->CB1F0_00_0      up          CB1F0_00_0->DPC4PFE0      up
DPC4PFE1->CB1F0_00_1      up          CB1F0_00_1->DPC4PFE1      up
DPC4PFE2->CB1F0_00_2      up          CB1F0_00_2->DPC4PFE2      up
DPC4PFE3->CB1F0_00_3      up          CB1F0_00_3->DPC4PFE3      up
DPC7PFE0->CB1F0_01_0      Down        CB1F0_01_0->DPC7PFE0      Down
DPC7PFE1->CB1F0_01_1      Down        CB1F0_01_1->DPC7PFE1      Down
DPC7PFE2->CB1F0_01_2      Down        CB1F0_01_2->DPC7PFE2      Down
DPC7PFE3->CB1F0_01_3      Down        CB1F0_01_3->DPC7PFE3      Down
DPC3PFE0->CB1F0_03_0      Down        CB1F0_03_0->DPC3PFE0      Down
DPC3PFE1->CB1F0_03_1      Down        CB1F0_03_1->DPC3PFE1      Down
DPC3PFE2->CB1F0_03_2      Down        CB1F0_03_2->DPC3PFE2      Down
DPC3PFE3->CB1F0_03_3      Down        CB1F0_03_3->DPC3PFE3      Down
DPC8PFE0->CB1F0_05_0      Down        CB1F0_05_0->DPC8PFE0      Down
DPC8PFE1->CB1F0_05_1      Down        CB1F0_05_1->DPC8PFE1      Down
DPC8PFE2->CB1F0_05_2      Down        CB1F0_05_2->DPC8PFE2      Down
DPC8PFE3->CB1F0_05_3      Down        CB1F0_05_3->DPC8PFE3      Down
DPC1PFE0->CB1F0_06_0      Down        CB1F0_06_0->DPC1PFE0      Down
DPC1PFE1->CB1F0_06_1      Down        CB1F0_06_1->DPC1PFE1      Down
DPC1PFE2->CB1F0_06_2      Down        CB1F0_06_2->DPC1PFE2      Down
DPC1PFE3->CB1F0_06_3      Down        CB1F0_06_3->DPC1PFE3      Down
DPC10PFE0->CB1F0_07_0     Down        CB1F0_07_0->DPC10PFE0     Down
DPC10PFE1->CB1F0_07_1     Down        CB1F0_07_1->DPC10PFE1     Down
DPC10PFE2->CB1F0_07_2     Down        CB1F0_07_2->DPC10PFE2     Down
DPC10PFE3->CB1F0_07_3     Down        CB1F0_07_3->DPC10PFE3     Down
DPC11PFE0->CB1F0_08_0     Down        CB1F0_08_0->DPC11PFE0     Down
DPC11PFE1->CB1F0_08_1     Down        CB1F0_08_1->DPC11PFE1     Down
```



```
DPC11PFE2->CB1F0_08_2    Down    CB1F0_08_2->DPC11PFE2    Down
DPC11PFE3->CB1F0_08_3    Down    CB1F0_08_3->DPC11PFE3    Down
DPC0PFE0->CB1F0_09_0     Down    CB1F0_09_0->DPC0PFE0     Down
DPC0PFE1->CB1F0_09_1     Down    CB1F0_09_1->DPC0PFE1     Down
DPC0PFE2->CB1F0_09_2     Down    CB1F0_09_2->DPC0PFE2     Down
DPC0PFE3->CB1F0_09_3     Down    CB1F0_09_3->DPC0PFE3     Down
DPC9PFE0->CB1F0_11_0     Down    CB1F0_11_0->DPC9PFE0     Down
DPC9PFE1->CB1F0_11_1     Down    CB1F0_11_1->DPC9PFE1     Down
DPC9PFE2->CB1F0_11_2     Down    CB1F0_11_2->DPC9PFE2     Down
DPC9PFE3->CB1F0_11_3     Down    CB1F0_11_3->DPC9PFE3     Down
DPC2PFE0->CB1F0_13_0     up      CB1F0_13_0->DPC2PFE0     up
DPC2PFE1->CB1F0_13_1     up      CB1F0_13_1->DPC2PFE1     up
DPC2PFE2->CB1F0_13_2     up      CB1F0_13_2->DPC2PFE2     up
DPC2PFE3->CB1F0_13_3     up      CB1F0_13_3->DPC2PFE3     up
DPC6PFE0->CB1F0_14_0     Down    CB1F0_14_0->DPC6PFE0     Down
DPC6PFE1->CB1F0_14_1     Down    CB1F0_14_1->DPC6PFE1     Down
DPC6PFE2->CB1F0_14_2     Down    CB1F0_14_2->DPC6PFE2     Down
DPC6PFE3->CB1F0_14_3     Down    CB1F0_14_3->DPC6PFE3     Down
DPC5PFE0->CB1F0_15_0     Down    CB1F0_15_0->DPC5PFE0     Down
DPC5PFE1->CB1F0_15_1     Down    CB1F0_15_1->DPC5PFE1     Down
DPC5PFE2->CB1F0_15_2     Down    CB1F0_15_2->DPC5PFE2     Down
DPC5PFE3->CB1F0_15_3     Down    CB1F0_15_3->DPC5PFE3     Down
DPC4PFE0->CB1F1_00_0     up      CB1F1_00_0->DPC4PFE0     up
DPC4PFE1->CB1F1_00_1     up      CB1F1_00_1->DPC4PFE1     up
DPC4PFE2->CB1F1_00_2     up      CB1F1_00_2->DPC4PFE2     up
DPC4PFE3->CB1F1_00_3     up      CB1F1_00_3->DPC4PFE3     up
DPC7PFE0->CB1F1_01_0     Down    CB1F1_01_0->DPC7PFE0     Down
DPC7PFE1->CB1F1_01_1     Down    CB1F1_01_1->DPC7PFE1     Down
DPC7PFE2->CB1F1_01_2     Down    CB1F1_01_2->DPC7PFE2     Down
DPC7PFE3->CB1F1_01_3     Down    CB1F1_01_3->DPC7PFE3     Down
DPC3PFE0->CB1F1_03_0     Down    CB1F1_03_0->DPC3PFE0     Down
DPC3PFE1->CB1F1_03_1     Down    CB1F1_03_1->DPC3PFE1     Down
DPC3PFE2->CB1F1_03_2     Down    CB1F1_03_2->DPC3PFE2     Down
DPC3PFE3->CB1F1_03_3     Down    CB1F1_03_3->DPC3PFE3     Down
DPC8PFE0->CB1F1_05_0     Down    CB1F1_05_0->DPC8PFE0     Down
DPC8PFE1->CB1F1_05_1     Down    CB1F1_05_1->DPC8PFE1     Down
DPC8PFE2->CB1F1_05_2     Down    CB1F1_05_2->DPC8PFE2     Down
DPC8PFE3->CB1F1_05_3     Down    CB1F1_05_3->DPC8PFE3     Down
DPC1PFE0->CB1F1_06_0     Down    CB1F1_06_0->DPC1PFE0     Down
DPC1PFE1->CB1F1_06_1     Down    CB1F1_06_1->DPC1PFE1     Down
DPC1PFE2->CB1F1_06_2     Down    CB1F1_06_2->DPC1PFE2     Down
DPC1PFE3->CB1F1_06_3     Down    CB1F1_06_3->DPC1PFE3     Down
DPC10PFE0->CB1F1_07_0    Down    CB1F1_07_0->DPC10PFE0    Down
DPC10PFE1->CB1F1_07_1    Down    CB1F1_07_1->DPC10PFE1    Down
DPC10PFE2->CB1F1_07_2    Down    CB1F1_07_2->DPC10PFE2    Down
DPC10PFE3->CB1F1_07_3    Down    CB1F1_07_3->DPC10PFE3    Down
DPC11PFE0->CB1F1_08_0    Down    CB1F1_08_0->DPC11PFE0    Down
DPC11PFE1->CB1F1_08_1    Down    CB1F1_08_1->DPC11PFE1    Down
DPC11PFE2->CB1F1_08_2    Down    CB1F1_08_2->DPC11PFE2    Down
DPC11PFE3->CB1F1_08_3    Down    CB1F1_08_3->DPC11PFE3    Down
DPC0PFE0->CB1F1_09_0     Down    CB1F1_09_0->DPC0PFE0     Down
DPC0PFE1->CB1F1_09_1     Down    CB1F1_09_1->DPC0PFE1     Down
DPC0PFE2->CB1F1_09_2     Down    CB1F1_09_2->DPC0PFE2     Down
DPC0PFE3->CB1F1_09_3     Down    CB1F1_09_3->DPC0PFE3     Down
DPC9PFE0->CB1F1_11_0     Down    CB1F1_11_0->DPC9PFE0     Down
DPC9PFE1->CB1F1_11_1     Down    CB1F1_11_1->DPC9PFE1     Down
DPC9PFE2->CB1F1_11_2     Down    CB1F1_11_2->DPC9PFE2     Down
DPC9PFE3->CB1F1_11_3     Down    CB1F1_11_3->DPC9PFE3     Down
DPC2PFE0->CB1F1_13_0     up      CB1F1_13_0->DPC2PFE0     up
DPC2PFE1->CB1F1_13_1     up      CB1F1_13_1->DPC2PFE1     up
DPC2PFE2->CB1F1_13_2     up      CB1F1_13_2->DPC2PFE2     up
```

```
DPC2PFE3->CB1F1_13_3     up          CB1F1_13_3->DPC2PFE3     up
DPC6PFE0->CB1F1_14_0     Down        CB1F1_14_0->DPC6PFE0     Down
DPC6PFE1->CB1F1_14_1     Down        CB1F1_14_1->DPC6PFE1     Down
DPC6PFE2->CB1F1_14_2     Down        CB1F1_14_2->DPC6PFE2     Down
DPC6PFE3->CB1F1_14_3     Down        CB1F1_14_3->DPC6PFE3     Down
DPC5PFE0->CB1F1_15_0     Down        CB1F1_15_0->DPC5PFE0     Down
DPC5PFE1->CB1F1_15_1     Down        CB1F1_15_1->DPC5PFE1     Down
DPC5PFE2->CB1F1_15_2     Down        CB1F1_15_2->DPC5PFE2     Down
DPC5PFE3->CB1F1_15_3     Down        CB1F1_15_3->DPC5PFE3     Down
plane 4 is not up
plane 5 is not up
```

show chassis fabric map plane 1 (EX8200 Switch)

user@host> **show chassis fabric map plane 1**

```
DPC6PFE0->CB0F0_00_0     Down        CB0F0_00_0->DPC6PFE0     Down
DPC6PFE1->CB0F0_00_1     Down        CB0F0_00_1->DPC6PFE1     Down
DPC6PFE2->CB0F0_00_2     Down        CB0F0_00_2->DPC6PFE2     Down
DPC6PFE3->CB0F0_00_3     Down        CB0F0_00_3->DPC6PFE3     Down
DPC0PFE0->CB0F0_01_0     Down        CB0F0_01_0->DPC0PFE0     Down
DPC0PFE1->CB0F0_01_1     Down        CB0F0_01_1->DPC0PFE1     Down
DPC0PFE2->CB0F0_01_2     Down        CB0F0_01_2->DPC0PFE2     Down
DPC0PFE3->CB0F0_01_3     Down        CB0F0_01_3->DPC0PFE3     Down
DPC5PFE0->CB0F0_02_0     Down        CB0F0_02_0->DPC5PFE0     Down
DPC5PFE1->CB0F0_02_1     Down        CB0F0_02_1->DPC5PFE1     Down
DPC5PFE2->CB0F0_02_2     Down        CB0F0_02_2->DPC5PFE2     Down
DPC5PFE3->CB0F0_02_3     Down        CB0F0_02_3->DPC5PFE3     Down
DPC3PFE0->CB0F0_03_0     Down        CB0F0_03_0->DPC3PFE0     Down
DPC3PFE1->CB0F0_03_1     Down        CB0F0_03_1->DPC3PFE1     Down
DPC3PFE2->CB0F0_03_2     Down        CB0F0_03_2->DPC3PFE2     Down
DPC3PFE3->CB0F0_03_3     Down        CB0F0_03_3->DPC3PFE3     Down
DPC4PFE0->CB0F0_04_0     Down        CB0F0_04_0->DPC4PFE0     Down
DPC4PFE1->CB0F0_04_1     Down        CB0F0_04_1->DPC4PFE1     Down
DPC4PFE2->CB0F0_04_2     Down        CB0F0_04_2->DPC4PFE2     Down
DPC4PFE3->CB0F0_04_3     Down        CB0F0_04_3->DPC4PFE3     Down
DPC2PFE0->CB0F0_05_0     Down        CB0F0_05_0->DPC2PFE0     Down
DPC2PFE1->CB0F0_05_1     Down        CB0F0_05_1->DPC2PFE1     Down
DPC2PFE2->CB0F0_05_2     Down        CB0F0_05_2->DPC2PFE2     Down
DPC2PFE3->CB0F0_05_3     Down        CB0F0_05_3->DPC2PFE3     Down
DPC7PFE0->CB0F0_06_0     Down        CB0F0_06_0->DPC7PFE0     Down
DPC7PFE1->CB0F0_06_1     Down        CB0F0_06_1->DPC7PFE1     Down
DPC7PFE2->CB0F0_06_2     Down        CB0F0_06_2->DPC7PFE2     Down
DPC7PFE3->CB0F0_06_3     Down        CB0F0_06_3->DPC7PFE3     Down
DPC1PFE0->CB0F0_07_0     Down        CB0F0_07_0->DPC1PFE0     Down
DPC1PFE1->CB0F0_07_1     Down        CB0F0_07_1->DPC1PFE1     Down
DPC1PFE2->CB0F0_07_2     Down        CB0F0_07_2->DPC1PFE2     Down
DPC1PFE3->CB0F0_07_3     Down        CB0F0_07_3->DPC1PFE3     Down
DPC0PFE0->CB0F0_08_0     Down        CB0F0_08_0->DPC0PFE0     Down
DPC0PFE1->CB0F0_08_1     Down        CB0F0_08_1->DPC0PFE1     Down
DPC0PFE2->CB0F0_08_2     Down        CB0F0_08_2->DPC0PFE2     Down
DPC0PFE3->CB0F0_08_3     Down        CB0F0_08_3->DPC0PFE3     Down
DPC7PFE0->CB0F0_09_0     Down        CB0F0_09_0->DPC7PFE0     Down
DPC7PFE1->CB0F0_09_1     Down        CB0F0_09_1->DPC7PFE1     Down
DPC7PFE2->CB0F0_09_2     Down        CB0F0_09_2->DPC7PFE2     Down
DPC7PFE3->CB0F0_09_3     Down        CB0F0_09_3->DPC7PFE3     Down
DPC1PFE0->CB0F0_10_0     Down        CB0F0_10_0->DPC1PFE0     Down
DPC1PFE1->CB0F0_10_1     Down        CB0F0_10_1->DPC1PFE1     Down
DPC1PFE2->CB0F0_10_2     Down        CB0F0_10_2->DPC1PFE2     Down
DPC1PFE3->CB0F0_10_3     Down        CB0F0_10_3->DPC1PFE3     Down
DPC4PFE0->CB0F0_11_0     Down        CB0F0_11_0->DPC4PFE0     Down
```

```
DPC4PFE1->CB0F0_11_1       Down          CB0F0_11_1->DPC4PFE1       Down
DPC4PFE2->CB0F0_11_2       Down          CB0F0_11_2->DPC4PFE2       Down
DPC4PFE3->CB0F0_11_3       Down          CB0F0_11_3->DPC4PFE3       Down
DPC2PFE0->CB0F0_12_0       Down          CB0F0_12_0->DPC2PFE0       Down
DPC2PFE1->CB0F0_12_1       Down          CB0F0_12_1->DPC2PFE1       Down
DPC2PFE2->CB0F0_12_2       Down          CB0F0_12_2->DPC2PFE2       Down
DPC2PFE3->CB0F0_12_3       Down          CB0F0_12_3->DPC2PFE3       Down
DPC5PFE0->CB0F0_13_0       Down          CB0F0_13_0->DPC5PFE0       Down
DPC5PFE1->CB0F0_13_1       Down          CB0F0_13_1->DPC5PFE1       Down
DPC5PFE2->CB0F0_13_2       Down          CB0F0_13_2->DPC5PFE2       Down
DPC5PFE3->CB0F0_13_3       Down          CB0F0_13_3->DPC5PFE3       Down
DPC3PFE0->CB0F0_14_0       Down          CB0F0_14_0->DPC3PFE0       Down
DPC3PFE1->CB0F0_14_1       Down          CB0F0_14_1->DPC3PFE1       Down
DPC3PFE2->CB0F0_14_2       Down          CB0F0_14_2->DPC3PFE2       Down
DPC3PFE3->CB0F0_14_3       Down          CB0F0_14_3->DPC3PFE3       Down
DPC6PFE0->CB0F0_15_0       Down          CB0F0_15_0->DPC6PFE0       Down
DPC6PFE1->CB0F0_15_1       Down          CB0F0_15_1->DPC6PFE1       Down
DPC6PFE2->CB0F0_15_2       Down          CB0F0_15_2->DPC6PFE2       Down
DPC6PFE3->CB0F0_15_3       Down          CB0F0_15_3->DPC6PFE3       Down
```


show chassis fabric optics

Syntax (TX Matrix Plus Router with 3D SIBs)

show chassis fabric optics
<*sib-slot*>
<lcc *number* | sfc *number*>
<brief | detail>

Release Information

Command introduced in Junos OS Release 13.1 for the TX Matrix Plus router with 3D SIBs.

Description

(TX Matrix Plus routers with 3D SIBs only) Display information about the optical ports on the TX Matrix Plus router (or the switch-fabric chassis (SFC)) and on the T1600 or T4000 line-card chassis (LCCs) connected to it in a routing matrix.

Options

none—Display brief information about the optical ports on the SFC and LCCs in the routing matrix.

sib-number—(Optional) Display information about the optical ports for the specified SIB number.

lcc *number*—(Optional) Display information about the optical ports for the specified T1600 or T4000 LCC that is connected to a TX Matrix Plus router with 3D SIBs. Replace ***number*** with the following values depending on the LCC configuration:

- From **0** through **7** on a T1600 router connected to a TX Matrix Plus router with 3D SIBs.
- **0**, **2**, **4**, or **6** on a T4000 router connected to a TX Matrix Plus router with 3D SIBs.

sfc *number*—(Optional) Display information about the optical ports for the specified SFC number. Replace ***number*** with **0**.

brief—(Optional) Display brief information about the optical ports.

detail—(Optional) Display detailed information about the optical ports.

Required Privilege Level

view

Related Documentation

- *Overview of a Routing Matrix with a TX Matrix Plus Router*

List of Sample Output

show chassis fabric optics (TX Matrix Plus Router with 3D SIBs) on page 1067
show chassis fabric optics (TX Matrix Plus Router with 3D SIBs) on page 1072
show chassis fabric optics sfc (TX Matrix Plus Router with 3D SIBs) on page 1073
show chassis fabric optics lcc (TX Matrix Plus Router with 3D SIBs) on page 1075

Output Fields

Table 73 on page 1067 lists the output fields for the **show chassis fabric optics** command. Output fields are listed in the approximate order in which they appear.

Table 73: show chassis fabric optics Output Fields

Field Name	Field Description
Port	Indicates port number.
Cable state	Indicates the cable state: • **CABLE_CONNECTED**—Cable is connected properly and is in an operable state. • **CABLE_LOOPBACK**—A loopback cable is connected to the port. • **CABLE_NOT_CONNECTED**—The optical port is not connected with any cable or all the channels are powered off on the remote side. • **CABLE_MIS_CONNECTED**—Cable is connected to an incorrect optical port. • **CABLE_CONNECTED_WITH_ERROR**—Cable is connected to the optical port, but indicates a cable issue. Refer to the optical cable fault alarms to identify the cable issue. • **CABLE_NOT_SUPPORTED**—The connected optics module is not supported. Only optics modules having Juniper part numbers are supported. • **CABLE_MODULE_ABSENT**—No optics module is connected. • **CABLE_MODULE_FAULT**— The connected optics module has an irrecoverable fault. The optics module must be replaced for the device to recover from this error. This state can be caused by a device failure during initialization, a device crossing the high-temperature threshold, or a voltage failure on the optics module during normal operation. • **CABLE_ELEC_LOOPBACK**—An electrical loopback module is connected to the optics port. NOTE: Only electrical loopback modules from ELPEUS are supported. • **CABLE_ERROR**—Cable cannot be detected, probably because the SIB is not online yet.
Module Type	Indicates module type.

Sample Output

show chassis fabric optics (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric optics
sfc0-re0:
---------------------------------------------------------------------------
Port      Cable state            Module Type
sfc0-f13sib0:
0         MODULE_ABSENT          No Module
1         MODULE_ABSENT          No Module
2         CABLE_CONNECTED        CXP Module
3         CABLE_CONNECTED        CXP Module
4         MODULE_ABSENT          No Module
5         MODULE_ABSENT          No Module
6         MODULE_ABSENT          No Module
7         MODULE_ABSENT          No Module
8         CABLE_CONNECTED        CXP Module
9         MODULE_ABSENT          No Module
10        MODULE_ABSENT          No Module
11        MODULE_ABSENT          No Module
```



```
12        MODULE_ABSENT           No Module
13        MODULE_ABSENT           No Module
14        MODULE_ABSENT           No Module
15        MODULE_ABSENT           No Module
sfc0-f13sib1:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         CABLE_CONNECTED         CXP Module
5         CABLE_CONNECTED         CXP Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
8         MODULE_ABSENT           No Module
9         CABLE_CONNECTED         CXP Module
10        MODULE_ABSENT           No Module
11        MODULE_ABSENT           No Module
12        MODULE_ABSENT           No Module
13        MODULE_ABSENT           No Module
14        MODULE_ABSENT           No Module
15        CABLE_CONNECTED         CXP Module
sfc0-f13sib2: SIB slot invalid
sfc0-f13sib3:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         CABLE_CONNECTED         CXP Module
3         CABLE_CONNECTED         CXP Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
8         CABLE_CONNECTED         CXP Module
9         MODULE_ABSENT           No Module
10        MODULE_ABSENT           No Module
11        MODULE_ABSENT           No Module
12        MODULE_ABSENT           No Module
13        MODULE_ABSENT           No Module
14        MODULE_ABSENT           No Module
15        MODULE_ABSENT           No Module
sfc0-f13sib4:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         CABLE_CONNECTED         CXP Module
5         CABLE_CONNECTED         CXP Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
8         MODULE_ABSENT           No Module
9         CABLE_CONNECTED         CXP Module
10        MODULE_ABSENT           No Module
11        MODULE_ABSENT           No Module
12        MODULE_ABSENT           No Module
13        MODULE_ABSENT           No Module
14        MODULE_ABSENT           No Module
15        CABLE_CONNECTED         CXP Module
sfc0-f13sib5: SIB slot invalid
sfc0-f13sib6:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         CABLE_CONNECTED         CXP Module
```

```
3         CABLE_CONNECTED        CXP Module
4         MODULE_ABSENT          No Module
5         MODULE_ABSENT          No Module
6         MODULE_ABSENT          No Module
7         MODULE_ABSENT          No Module
8         CABLE_CONNECTED        CXP Module
9         MODULE_ABSENT          No Module
10        MODULE_ABSENT          No Module
11        MODULE_ABSENT          No Module
12        MODULE_ABSENT          No Module
13        MODULE_ABSENT          No Module
14        MODULE_ABSENT          No Module
15        MODULE_ABSENT          No Module
sfc0-f13sib7:
0         MODULE_ABSENT          No Module
1         MODULE_ABSENT          No Module
2         MODULE_ABSENT          No Module
3         MODULE_ABSENT          No Module
4         CABLE_CONNECTED        CXP Module
5         CABLE_CONNECTED        CXP Module
6         MODULE_ABSENT          No Module
7         MODULE_ABSENT          No Module
8         MODULE_ABSENT          No Module
9         CABLE_CONNECTED        CXP Module
10        MODULE_ABSENT          No Module
11        MODULE_ABSENT          No Module
12        MODULE_ABSENT          No Module
13        MODULE_ABSENT          No Module
14        MODULE_ABSENT          No Module
15        CABLE_CONNECTED        CXP Module
sfc0-f13sib8:
0         MODULE_ABSENT          No Module
1         MODULE_ABSENT          No Module
2         CABLE_CONNECTED        CXP Module
3         CABLE_CONNECTED        CXP Module
4         MODULE_ABSENT          No Module
5         MODULE_ABSENT          No Module
6         MODULE_ABSENT          No Module
7         MODULE_ABSENT          No Module
8         CABLE_CONNECTED        CXP Module
9         MODULE_ABSENT          No Module
10        MODULE_ABSENT          No Module
11        MODULE_ABSENT          No Module
12        MODULE_ABSENT          No Module
13        MODULE_ABSENT          No Module
14        MODULE_ABSENT          No Module
15        MODULE_ABSENT          No Module
sfc0-f13sib9:
0         MODULE_ABSENT          No Module
1         MODULE_ABSENT          No Module
2         MODULE_ABSENT          No Module
3         MODULE_ABSENT          No Module
4         CABLE_CONNECTED        CXP Module
5         CABLE_CONNECTED        CXP Module
6         MODULE_ABSENT          No Module
7         MODULE_ABSENT          No Module
8         MODULE_ABSENT          No Module
9         CABLE_CONNECTED        CXP Module
10        MODULE_ABSENT          No Module
11        MODULE_ABSENT          No Module
12        MODULE_ABSENT          No Module
```

```
13        MODULE_ABSENT           No Module
14        MODULE_ABSENT           No Module
15        CABLE_CONNECTED         CXP Module
sfc0-f13sib10: SIB slot invalid
sfc0-f13sib11: SIB slot empty
sfc0-f13sib12: SIB slot empty
sfc0-f13sib13: SIB slot invalid
sfc0-f13sib14: SIB slot invalid
sfc0-f13sib15: SIB slot invalid

lcc0-re0:
--------------------------------------------------------------------------
Port      Cable state             Module Type
lcc0-sib0:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         CABLE_CONNECTED         CXP Module
3         CABLE_CONNECTED         CXP Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
lcc0-sib1:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         CABLE_CONNECTED         CXP Module
3         CABLE_CONNECTED         CXP Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
lcc0-sib2:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         CABLE_CONNECTED         CXP Module
3         CABLE_CONNECTED         CXP Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
lcc0-sib3:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         CABLE_CONNECTED         CXP Module
3         CABLE_CONNECTED         CXP Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
lcc0-sib4: SIB slot empty

lcc4-re0:
--------------------------------------------------------------------------
Port      Cable state             Module Type
lcc4-sib0:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         CABLE_CONNECTED         CXP Module
5         CABLE_CONNECTED         CXP Module
```



```
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
lcc4-sib1:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         CABLE_CONNECTED         CXP Module
5         CABLE_CONNECTED         CXP Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
lcc4-sib2:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         CABLE_CONNECTED         CXP Module
5         CABLE_CONNECTED         CXP Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
lcc4-sib3:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         CABLE_CONNECTED         CXP Module
5         CABLE_CONNECTED         CXP Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
lcc4-sib4: SIB slot empty

lcc7-re0:
--------------------------------------------------------------------------
Port      Cable state             Module Type
lcc7-sib0:
0         CABLE_CONNECTED         CXP Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         CABLE_CONNECTED         CXP Module
7         MODULE_ABSENT           No Module
lcc7-sib1:
0         CABLE_CONNECTED         CXP Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         CABLE_CONNECTED         CXP Module
7         MODULE_ABSENT           No Module
lcc7-sib2:
0         CABLE_CONNECTED         CXP Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         CABLE_CONNECTED         CXP Module
7         MODULE_ABSENT           No Module
```

```
lcc7-sib3:
0          CABLE_CONNECTED          CXP Module
1          MODULE_ABSENT            No Module
2          MODULE_ABSENT            No Module
3          MODULE_ABSENT            No Module
4          MODULE_ABSENT            No Module
5          MODULE_ABSENT            No Module
6          CABLE_CONNECTED          CXP Module
7          MODULE_ABSENT            No Module
lcc7-sib4: SIB slot empty
```

show chassis fabric optics (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric optics 0
sfc0-re0:
--------------------------------------------------------------------------
Port       Cable state              Module Type
sfc0-f13sib0:
0          MODULE_ABSENT            No Module
1          MODULE_ABSENT            No Module
2          CABLE_CONNECTED          CXP Module
3          CABLE_CONNECTED          CXP Module
4          MODULE_ABSENT            No Module
5          MODULE_ABSENT            No Module
6          MODULE_ABSENT            No Module
7          MODULE_ABSENT            No Module
8          CABLE_CONNECTED          CXP Module
9          MODULE_ABSENT            No Module
10         MODULE_ABSENT            No Module
11         MODULE_ABSENT            No Module
12         MODULE_ABSENT            No Module
13         MODULE_ABSENT            No Module
14         MODULE_ABSENT            No Module
15         MODULE_ABSENT            No Module

lcc0-re0:
--------------------------------------------------------------------------
Port       Cable state              Module Type
lcc0-sib0:
0          MODULE_ABSENT            No Module
1          MODULE_ABSENT            No Module
2          CABLE_CONNECTED          CXP Module
3          CABLE_CONNECTED          CXP Module
4          MODULE_ABSENT            No Module
5          MODULE_ABSENT            No Module
6          MODULE_ABSENT            No Module
7          MODULE_ABSENT            No Module

lcc4-re0:
--------------------------------------------------------------------------
Port       Cable state              Module Type
lcc4-sib0:
0          MODULE_ABSENT            No Module
1          MODULE_ABSENT            No Module
2          MODULE_ABSENT            No Module
3          MODULE_ABSENT            No Module
4          CABLE_CONNECTED          CXP Module
5          CABLE_CONNECTED          CXP Module
6          MODULE_ABSENT            No Module
7          MODULE_ABSENT            No Module
```



```
lcc7-re0:
--------------------------------------------------------------------------
Port      Cable state              Module Type
lcc7-sib0:
0         CABLE_CONNECTED          CXP Module
1         MODULE_ABSENT            No Module
2         MODULE_ABSENT            No Module
3         MODULE_ABSENT            No Module
4         MODULE_ABSENT            No Module
5         MODULE_ABSENT            No Module
6         CABLE_CONNECTED          CXP Module
7         MODULE_ABSENT            No Module
```

show chassis fabric optics sfc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric optics sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Port      Cable state              Module Type
sfc0-f13sib0:
0         MODULE_ABSENT            No Module
1         MODULE_ABSENT            No Module
2         CABLE_CONNECTED          CXP Module
3         CABLE_CONNECTED          CXP Module
4         MODULE_ABSENT            No Module
5         MODULE_ABSENT            No Module
6         MODULE_ABSENT            No Module
7         MODULE_ABSENT            No Module
8         CABLE_CONNECTED          CXP Module
9         MODULE_ABSENT            No Module
10        MODULE_ABSENT            No Module
11        MODULE_ABSENT            No Module
12        MODULE_ABSENT            No Module
13        MODULE_ABSENT            No Module
14        MODULE_ABSENT            No Module
15        MODULE_ABSENT            No Module
sfc0-f13sib1:
0         MODULE_ABSENT            No Module
1         MODULE_ABSENT            No Module
2         MODULE_ABSENT            No Module
3         MODULE_ABSENT            No Module
4         CABLE_CONNECTED          CXP Module
5         CABLE_CONNECTED          CXP Module
6         MODULE_ABSENT            No Module
7         MODULE_ABSENT            No Module
8         MODULE_ABSENT            No Module
9         CABLE_CONNECTED          CXP Module
10        MODULE_ABSENT            No Module
11        MODULE_ABSENT            No Module
12        MODULE_ABSENT            No Module
13        MODULE_ABSENT            No Module
14        MODULE_ABSENT            No Module
15        CABLE_CONNECTED          CXP Module
sfc0-f13sib2: SIB slot invalid
sfc0-f13sib3:
0         MODULE_ABSENT            No Module
1         MODULE_ABSENT            No Module
2         CABLE_CONNECTED          CXP Module
3         CABLE_CONNECTED          CXP Module
4         MODULE_ABSENT            No Module
5         MODULE_ABSENT            No Module
```

```
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
8         CABLE_CONNECTED         CXP Module
9         MODULE_ABSENT           No Module
10        MODULE_ABSENT           No Module
11        MODULE_ABSENT           No Module
12        MODULE_ABSENT           No Module
13        MODULE_ABSENT           No Module
14        MODULE_ABSENT           No Module
15        MODULE_ABSENT           No Module
sfc0-f13sib4:
sfc0-f13sib4:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         CABLE_CONNECTED         CXP Module
5         CABLE_CONNECTED         CXP Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
8         MODULE_ABSENT           No Module
9         CABLE_CONNECTED         CXP Module
10        MODULE_ABSENT           No Module
11        MODULE_ABSENT           No Module
12        MODULE_ABSENT           No Module
13        MODULE_ABSENT           No Module
14        MODULE_ABSENT           No Module
15        CABLE_CONNECTED         CXP Module
sfc0-f13sib5: SIB slot invalid
sfc0-f13sib6:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         CABLE_CONNECTED         CXP Module
3         CABLE_CONNECTED         CXP Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
8         CABLE_CONNECTED         CXP Module
9         MODULE_ABSENT           No Module
10        MODULE_ABSENT           No Module
11        MODULE_ABSENT           No Module
12        MODULE_ABSENT           No Module
13        MODULE_ABSENT           No Module
14        MODULE_ABSENT           No Module
15        MODULE_ABSENT           No Module
sfc0-f13sib7:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         CABLE_CONNECTED         CXP Module
5         CABLE_CONNECTED         CXP Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
8         MODULE_ABSENT           No Module
9         CABLE_CONNECTED         CXP Module
10        MODULE_ABSENT           No Module
11        MODULE_ABSENT           No Module
12        MODULE_ABSENT           No Module
13        MODULE_ABSENT           No Module
```

```
14        MODULE_ABSENT           No Module
15        CABLE_CONNECTED         CXP Module
sfc0-f13sib8:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         CABLE_CONNECTED         CXP Module
3         CABLE_CONNECTED         CXP Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
8         CABLE_CONNECTED         CXP Module
9         MODULE_ABSENT           No Module
10        MODULE_ABSENT           No Module
11        MODULE_ABSENT           No Module
12        MODULE_ABSENT           No Module
13        MODULE_ABSENT           No Module
14        MODULE_ABSENT           No Module
15        MODULE_ABSENT           No Module
sfc0-f13sib9:
0         MODULE_ABSENT           No Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         CABLE_CONNECTED         CXP Module
5         CABLE_CONNECTED         CXP Module
6         MODULE_ABSENT           No Module
7         MODULE_ABSENT           No Module
8         MODULE_ABSENT           No Module
9         CABLE_CONNECTED         CXP Module
10        MODULE_ABSENT           No Module
11        MODULE_ABSENT           No Module
12        MODULE_ABSENT           No Module
13        MODULE_ABSENT           No Module
14        MODULE_ABSENT           No Module
15        CABLE_CONNECTED         CXP Module
sfc0-f13sib10: SIB slot invalid
sfc0-f13sib11: SIB slot empty
sfc0-f13sib12: SIB slot empty
sfc0-f13sib13: SIB slot invalid
sfc0-f13sib14: SIB slot invalid
sfc0-f13sib15: SIB slot invalid
```

show chassis fabric optics lcc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric topology lcc 7
lcc7-re0:
---------------------------------------------------------------------------
Port      Cable state             Module Type
lcc7-sib0:
0         CABLE_CONNECTED         CXP Module
1         MODULE_ABSENT           No Module
2         MODULE_ABSENT           No Module
3         MODULE_ABSENT           No Module
4         MODULE_ABSENT           No Module
5         MODULE_ABSENT           No Module
6         CABLE_CONNECTED         CXP Module
7         MODULE_ABSENT           No Module
lcc7-sib1:
0         CABLE_CONNECTED         CXP Module
1         MODULE_ABSENT           No Module
```

```
2         MODULE_ABSENT          No Module
3         MODULE_ABSENT          No Module
4         MODULE_ABSENT          No Module
5         MODULE_ABSENT          No Module
6         CABLE_CONNECTED        CXP Module
7         MODULE_ABSENT          No Module
lcc7-sib2:
0         CABLE_CONNECTED        CXP Module
1         MODULE_ABSENT          No Module
2         MODULE_ABSENT          No Module
3         MODULE_ABSENT          No Module
4         MODULE_ABSENT          No Module
5         MODULE_ABSENT          No Module
6         CABLE_CONNECTED        CXP Module
7         MODULE_ABSENT          No Module
lcc7-sib3:
0         CABLE_CONNECTED        CXP Module
1         MODULE_ABSENT          No Module
2         MODULE_ABSENT          No Module
3         MODULE_ABSENT          No Module
4         MODULE_ABSENT          No Module
5         MODULE_ABSENT          No Module
6         CABLE_CONNECTED        CXP Module
7         MODULE_ABSENT          No Module
lcc7-sib4: SIB slot empty
```


show chassis fabric plane

List of Syntax

Syntax on page 1077
Syntax (TX Matrix Plus Router) on page 1077
Syntax (MX Series Routers) on page 1077
Syntax (MX2010 and MX2020 3D Universal Edge Routers) on page 1077

Syntax

```
show chassis fabric plane
```

Syntax (TX Matrix Plus Router)

show chassis fabric plane
<detail | extensive | terse>
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis fabric plane
<detail | extensive | terse>
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 and MX2020 3D Universal Edge Routers)

```
show chassis fabric plane
```

Release Information

Command introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.4 for EX Series switches.
detail, **extensive**, **lcc**, **sfc**, and **terse** options introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

(TX Matrix Plus router, T4000, T1600, M120, and MX Series routers and EX8200 switches only) On the M120 router, display the state of all fabric plane connections to the Forwarding Engine Boards (FEBs). On MX Series routers, display the state of all fabric plane connections to the Dense Port Concentrators (DPCs) and Packet Forwarding Engines (PFEs) on the Flexible PIC Concentrators (FPCs). On the TX Matrix Plus router, and on T1600 or T4000 routers in a routing matrix, display the state of the fabric management plane and the logical planes on the switch-fabric chassis (SFC) and line-card chassis (LCC). On EX8200 switches, display the state of all fabric planes. This command can be used on the master Routing Engine only.

Options

none—(MX2010 and MX2020 Routers only) (Optional) Display the state of the fabric management plane.

detail—(TX Matrix Plus routers, T1600 or T4000 routers in a routing matrix, and MX Series routers only) (Optional) Display detailed output for the fabric management plane. Show Switch Interface Board (SIB) states for the TXP-F13 SIB and the TXP-F2S SIB.

extensive—(TX Matrix Plus routers, T1600 or T4000 routers in a routing matrix, and MX Series routers only) (Optional) Display extensive output for the fabric management plane.

terse—(TX Matrix Plus routers and MX Series routers only) (Optional) Display terse output for the fabric management plane.

all-members—(MX Series routers only) (Optional) Display the state of all fabric plane connections on all members of the Virtual Chassis configuration.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display the state of all fabric plane connections on the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display the state of all fabric plane connections on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

sfc *number*—(TX Matrix Plus router only) (Optional) Show information about the TX Matrix Plus router (SFC). Replace ***number*** with **0**.

Required Privilege Level view

Related Documentation

- request chassis fabric plane on page 627
- show chassis fabric plane-location on page 1119
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

Output Fields Table 74 on page 1079 lists the output fields for the **show chassis fabric plane** command. Output fields are listed in the approximate order in which they appear.

Table 74: show chassis fabric plane Output Fields

Field Name	Field Description	Level of output
Plane	(TX Matrix Plus, MX Series routers, M120 routers, and EX8200 switches only) Number of the plane.	none

Plane state	(MX Series and M120 routers and EX8200 switches only) State of each plane:
	• **ACTIVE**—SIB is operational and running.
	NOTE: On the Enhanced MX SCB with MPCs, a maximum of 4 planes are operational and running. On all the other SCBs with MPCs, all the planes are operational and running.
	• **FAULTY**— SIB is in alarmed state where the SIB's plane is not operational for the following reasons:
	  • On-board fabric ASIC is not operational.
	  • Fiber optic connector faults.
	  • FPC connector faults.
	  • SIB midplane connector faults.
	(MX2010 and MX2020 Routers only) State of each plane:
	• **ACTIVE**—SFB is operational and running.
	• **OFFLINE**— SFB is in offline.
		none

FEB	(M120 routers only) FEB number and state of links to each FEB: • **Link error**—Link between SIB and FPC is not operational. • **Links ok**—Link between SIB and FPC is active. • **Unused**—No FPC is present.	none

Table 74: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output
FPC	(MX Series routers only) Slot number of each Dense Port Concentrator (DPC) or Flexible PIC Concentrator (FPC). An FPC occupies two DPC slots on an MX Series router. The interface corresponds to the lowest numbered DPC slot for which the FPC is installed.	none
PFE	(MX Series and M120 routers only) Slot number of each Packet Forwarding Engine and the state of the links to the DCP: **Links ok**, **Link error**, or **Unused**. Each DPC includes four Packet Forwarding Engines. • **Links ok**: Link between SIB and FPC is active. • **Link error**: Link between SIB and FPC is not operational. • **Unused**: No FPC is present. (On MX240 and MX480 routers with AS MLC modular carrier card and MPC4E only) Indicates that the link between the fabric plane and the hardware link on the modular carrier card or MPC4E is not operational. (MX2010 and MX2020 routers only) Slot number of each Packet Forwarding Engine and the state of the links to the DPC: **Links ok**, **Link error**, or **Unused**. Each DPC includes four Packet Forwarding Engines. • **Links ok**: Link between SFB and FPC is active. • **Link error**: Link between SFB and FPC is not operational. • **Unused**: No FPC is present.	none

Table 74: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output

State	(TX Matrix Plus, and T1600 or T4000 routers in a routing matrix only)—State of the fabric plane:
	• **Online**: Fabric plane is operational and running and links on the SIB are operational.
	• **Offline**: Fabric plane state is **Offline** because the plane does not have four or more F2S and one F13 online.
	• Empty: Fabric plane state is **Empty** if all SIBs in the plane are absent.
	• **Spare**: Fabric plane is redundant and can be operational if the operational fabric plane encounters an error.
	• **Check**: Fabric plane is in alarmed state due to the following reason and the cause of the error must be resolved:
	  ◦ One or more SIBs (belonging to the fabric plane) in the **Online** or **Spare** states has transitioned to the **Check** state. **Check** state of the SIB can be caused by link errors or destination errors.
	• **Fault**: Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the **Fault** state. A SIB can be in the **Fault** state because of the following reasons:
	  ◦ On-board fabric ASIC is not operational.
	  ◦ Fiber optic connector faults.
	  ◦ FPC connector faults.
	  ◦ SIB midplane connector faults.
	  ◦ Link errors have exceeded the threshold.
		none

Link Errors	(TX Matrix Plus routers with 3D SIBs only) indicate the number of links which are marked faulty because the errors on them have crossed threshold.	none
Cable Errors	(TX Matrix Plus routers with 3D SIBs only) Indicate the number of mandatory cables that are not connected, or in up state for that plane	none
Destination Errors	(TX Matrix Plus routers with 3D SIBs only) Indicates the number of destinations that are not reachable on this plane.	none
Uptime	(TX Matrix Plus, and T1600 or T4000 routers in a routing matrix only)—Time the fabric plane has been up and running.	none

Fabric Management Plane State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router

Table 74: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output

PLANE *number*	State of the fabric plane:
	• **Online**: Fabric plane is operational and running and links on the SIB are operational.
	• **Offline**: Fabric plane state is **Offline** because the plane does not have 4 or more F2S and 1 F13 online.
	• Empty: Fabric plane state is **Empty** if all SIBs in the plane are absent.
	• **Spare**: Fabric plane is redundant and can be operational if the operational fabric plane encounters an error.
	• **Check**: Fabric plane is in alarmed state due to the following reasons and the cause of the error must be resolved:
	  ◦ One or more SIBs (belonging to the fabric plane) in the **Online** or **Spare** states has transitioned to the **Check** state. **Check** state of the SIB can be caused because of link errors or destination errors.
	• **Fault**: Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the **Fault** state. A SIB can be in the **Fault** state because of the following reasons:
	  ◦ On-board fabric ASIC is not operational.
	  ◦ Fiber optic connector faults.
	  ◦ FPC connector faults.
	  ◦ SIB midplane connector faults.
	  ◦ Link errors have exceeded the threshold.
		extensive

SIB F13/F2S *slot-number*	State of the TXP-F13 SIB or TXP-F2S SIB:
	• **Activating**—Transitional state when the SIB is transitioning to the **Online** or **Spare** state.
	• **Deactivating**—Transitional state when the SIB is going offline.
	• **Online**—SIB is operational and running.
	• **Offline**—SIB is powered down.
	• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic.
	• **Empty**—No SIB is present.
	• **Fault**— SIB is in alarmed state because of the following reasons and the cause of the error must be resolved:
	  ◦ On-board fabric ASIC is not operational.
	  ◦ Fiber optic connector faults.
	  ◦ FPC connector faults.
	  ◦ SIB midplane connector faults.
	  ◦ Link errors have exceeded the threshold
	• **Check**—SIB is in alarmed state where the SIB is partially operational because of link or destination errors. Only a SIB that is **Online** or **Spare** can transition to the **Check** state.
	NOTE: If a SIB is not inserted properly, the SIB cannot transition to the **Online** or **Spare** state, and therefore cannot transition to the **Check** state.
		extensive

Table 74: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output
SIB F13 ***slot-number Odd/Even***	State of the TXP-F13 SIB even and odd port connection optical links from the TX Matrix Plus router (SFC) to the router (LCC) in the routing matrix . The left four ports on the SFC are labeled **Even** and provide connections to one even-numbered LCC—LCC0 or LCC2. The right four ports on the SFC are labeled **Odd** and provide connections to one odd-numbered LCC—LCC1 or LCC3.	**extensive**
LCC ***number*****,** **SIB** ***slot-number***	State of the SIB on the LCC that is connected to the **Even** or **Odd** port on the TXP-F13 SIB faceplate: • **Links ok**—Links between the TXP-F13 SIB on the SFC and the LCC are active. • **Links error**—One or more links between the TXP-F13 SIB on the SFC and the LCC, have experienced an error, but the affected links remain operational. • **Unused**—No SIB is present.	**extensive**
SG ***number*** **Port** ***number***	State of the SG chip ports on the LCC: • **Links ok**—Link is active. • **Link error**—Link is operational with errors. • **Link error crc saturated**—CRC has exceeded the rate threshold and reached saturation without optical issues—that is, a cable has not been cut, removed, or otherwise experienced an error. • **Link error crc saturated with optical errors**—CRC has exceeded the rate threshold and reached saturation with optical issues—that is, a cable has been cut, removed, or otherwise experienced an error. • **Unused**—Port is not in use.	**extensive**
SIB F2S ***slot-number***	State of the intra-chassis links between the TXP-F2S and TXP-F13 SIBs.	**extensive**

Fabric Management SIB State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router

Table 74: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output

SIB ***slot-number***	State of the SIBs on the T1600/T4000 router (LCC) in the routing matrix:
	• **Activating**—Transitional state when the SIB is coming online.
	• **Deactivating**—Transitional state when the SIB is going offline.
	• **Connected**—SIBS on an LCC are connected and trained, but are either not online or are spare, because the plane on the the TX Matrix Plus router (SFC) is still offline.
	The LCC SIB transitions to the **Connected** state when the F13 SIB to which it connects is online but the SFC plane (to which the LCC SIB connects) is offline for some reason; for instance, when there are insufficient number of F2 SIBs in the plane.
	• **Disconnected**—If an F13 SIB on the TX Matrix Plus router (SFC) goes offline, then the SIBs on the LCCs connected to the F13 SIB get disconnected.
	On the TX Matrix Plus router with 3D SIBs, the LCC SIB is also disconnected if the F13 SIB is online, but none of the cables are connected or trained.
	The **Disconnected** state is valid only for SIBs on an LCC. An LCC SIB transitions to the **Disconnected** state when the F13 SIB to which it connects goes **Offline**, irrespective of the state of the SFC plane.
	SFC Error—If an F13 SIB on the TX Matrix Plus router (SFC) transitions to the **Fault** state (because of link errors, for instance), and if an LCC SIB connected to the F13 SIB comes online, the LCC SIB transitions to the **SFC Error** state. This state indicates that the F13 SIB to which the LCC SIB is connected has errors.
	NOTE: The **Connected**, **Disconnected**, and **SFC Error** states are applicable only to the SIBs on an LCC.
	• **Online**—SIB is operational and running.
	• **Offline**—SIB is powered down.
	• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic.
	• **Empty**—No SIB is present.
	• **Fault**— SIB is in alarmed state where the SIB's plane is not operational for the following reasons:
	  ◦ On-board fabric ASIC is not operational.
	  ◦ Fiber optic connector faults.
	  ◦ FPC connector faults.
	  ◦ SIB midplane connector faults.
	  ◦ Link errors have exceeded the threshold
	• **Check**—SIB is in alarmed state where the SIB is partially operational because of link or destination errors. Only a SIB that is **Online** or **Spare** can transition to the **Check** state.
	NOTE: If a SIB is not inserted properly, the SIB cannot transition to the **Online** or **Spare** state, and therefore cannot transition to the **Check** state.
		extensive

Table 74: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output
LCC SIB Link State	State of the LCC SIB link: • **Links ok**—Link is active. • **Links error**—A link error has occurred, but the link remains operational. • **Unused**—SIB is not in use.	**extensive**
SG *number* Port *number*	State of the SG chip ports on the LCC: • **Links ok**—Link is active. • **Link error**—Link is operational with errors. • **Link error crc saturated**—CRC has exceeded the rate threshold and reached saturation without optical issues—that is, a cable has not been cut, removed, or otherwise experienced an error. • **Link error crc saturated with optical errors**—CRC has exceeded the rate threshold and reached saturation with optical issues—that is, a cable has been cut, removed, or otherwise experienced an error. • **Unused**—Port is not in use.	**extensive**

Sample Output

show chassis fabric plane (M120 Router)

```
user@host> show chassis fabric plane
Fabric management PLANE state
Plane 0
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok
Plane 1
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok
Plane 2
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok
Plane 3
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
```

```
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok
```

show chassis fabric plane (MX240 Router)

```
user@host> show chassis fabric plane
Plane 0
  Plane state: ACTIVE
      FPC 1
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 2
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
      FPC 1
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 2
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
      FPC 1
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 2
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
      FPC 1
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 2
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 4
  Plane state: SPARE
      FPC 1
          PFE 0 :Links ok
          PFE 1 :Links ok
```



```
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 2
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
Plane 5
  Plane state: SPARE
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 2
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
Plane 6
  Plane state: SPARE
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 2
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
Plane 7
  Plane state: SPARE
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 2
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
```

show chassis fabric plane (MX480 Router)

```
user@host> show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
```

```
            PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
      FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
      FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
Plane 4
  Plane state: SPARE
      FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
Plane 5
  Plane state: SPARE
      FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
Plane 6
  Plane state: SPARE
      FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
Plane 7
  Plane state: SPARE
      FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
```

show chassis fabric plane (MX960 Router)

```
user@host> show chassis fabric plane
Plane 0
  Plane state: ACTIVE
      FPC 0
            PFE 0 :Links ok
      FPC 2
            PFE 0 :Links ok
            PFE 1 :Links ok
Plane 1
  Plane state: ACTIVE
      FPC 0
            PFE 0 :Links ok
      FPC 2
            PFE 0 :Links ok
            PFE 1 :Links ok
```



```
Plane 2
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
          PFE 1 :Links ok
Plane 3
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
          PFE 1 :Links ok
```

show chassis fabric plane (MX240 with AS MLC Modular Carrier Card)

In the following output, FPC 1 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
Plane 1
  Plane state: ACTIVE
     Plane state: ACTIVE
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
Plane 2
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 3
  Plane state: ACTIVE
     Plane state: ACTIVE
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
Plane 4
  Plane state: ACTIVE
      Plane state: ACTIVE
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
Plane 5
  Plane state: ACTIVE
      FPC 1
          PFE 0 :Unused
```

```
      FPC 2
          PFE 0 :Links ok
Plane 6
  Plane state: ACTIVE
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
Plane 7
  Plane state: ACTIVE
      FPC 1
          PFE 0 :Unused
      FPC 2
          PFE 0 :Links ok
```

show chassis fabric plane (MX480 with AS MLC Modular Carrier Card)

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 1
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 2
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 3
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 4
  Plane state: ACTIVE
      FPC 2
```



```
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 5
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Unused
Plane 6
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Links ok
Plane 7
  Plane state: ACTIVE
      FPC 2
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 2 :Links ok
      FPC 5
          PFE 0 :Unused
```

show chassis fabric plane (MX480 Router with MPC4E)

```
user@host > show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 1
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 3
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 1 :Links ok
Plane 1
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 1
          PFE 0 :Links ok
          PFE 1 :Links ok
```



```
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 3
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
            PFE 1 :Links ok
  Plane 2
    Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 3
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
            PFE 1 :Links ok
  Plane 3
    Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 3
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
            PFE 1 :Links ok
  Plane 4
    Plane state: SPARE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 3
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
            PFE 1 :Links ok
  Plane 5
    Plane state: SPARE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
```



```
            PFE 3 :Links ok
        FPC 3
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
            PFE 1 :Links ok
Plane 6
  Plane state: SPARE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 3
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
            PFE 1 :Links ok
Plane 7
  Plane state: SPARE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 3
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
            PFE 1 :Links ok
```

show chassis fabric plane (MX960 with AS-MLC Modular Carrier Card)

In the following output, FPC 1 is a modular carrier card.

```
user@host> show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 5
            PFE 0 :Links ok
        FPC 8
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
```

```
          PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 1
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 5
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 1
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 5
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 1
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 5
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 4
  Plane state: SPARE
      FPC 0
```



```
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 5
            PFE 0 :Links ok
        FPC 8
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
  Plane 5
    Plane state: SPARE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 5
            PFE 0 :Links ok
        FPC 8
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
```

show chassis fabric plane (MX2010 Router)

```
user@host>show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 3
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 4
          PFE 0 :Links ok
      FPC 5
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 6
```

```
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 7
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 8
            PFE 0 :Links ok
        FPC 9
            PFE 0 :Links ok
            PFE 1 :Links ok
  Plane 1
    Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
        FPC 2
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 3
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 4
            PFE 0 :Links ok
        FPC 5
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 6
   PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 7
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 8
            PFE 0 :Links ok
        FPC 9
            PFE 0 :Links ok
            PFE 1 :Links ok
  Plane 2
    Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
        FPC 2
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 3
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 4
```



```
            PFE 0 :Links ok
        FPC 5
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 6
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 7
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 8
            PFE 0 :Links ok
        FPC 9
            PFE 0 :Links ok
            PFE 1 :Links ok
Plane 3
  Plane state: OFFLINE
Plane 4
  Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
        FPC 2
            PFE 0 :Links ok
PFE 1 :Links ok
        FPC 3
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 4
            PFE 0 :Links ok
        FPC 5
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 6
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 7
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 8
            PFE 0 :Links ok
        FPC 9
            PFE 0 :Links ok
            PFE 1 :Links ok
Plane 5
  Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
        FPC 2
            PFE 0 :Links ok
```

```
                PFE 1 :Links ok
            FPC 3
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 4
                PFE 0 :Links ok
            FPC 5
                PFE 0 :Links ok
                PFE 1 :Links ok
            FPC 6
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 7
                PFE 0 :Links ok
                PFE 1 :Links ok
            FPC 8
                PFE 0 :Links ok
            FPC 9
                PFE 0 :Links ok
 PFE 1 :Links ok
Plane 6
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 3
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 4
          PFE 0 :Links ok
      FPC 5
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 6
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 7
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 8
          PFE 0 :Links ok
      FPC 9
          PFE 0 :Links ok
          PFE 1 :Links ok
Plane 7
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
```



```
            PFE 1 :Links ok
        FPC 1
            PFE 0 :Links ok
        FPC 2
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 3
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 4
            PFE 0 :Links ok
        FPC 5
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 6
            PFE 0 :Links ok
   PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 7
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 8
            PFE 0 :Links ok
        FPC 9
            PFE 0 :Links ok
            PFE 1 :Links ok
```

show chassis fabric plane (MX2020 Router)

```
user@host>show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 1
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 2
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 3
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
      FPC 4
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
```



```
FPC 5
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 6
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 7
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 8
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 9
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 10
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 11
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 12
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 13
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 14
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 15
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 16
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 17
```



```
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 18
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 19
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
      Plane 1
        Plane state: ACTIVE
            FPC 0
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 1
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 2
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 3
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 4
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 5
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 6
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 7
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
            FPC 8
                PFE 0 :Links ok
                PFE 1 :Links ok
                PFE 2 :Links ok
                PFE 3 :Links ok
```



```
        FPC 9
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 10
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 11
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 12
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 13
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 14
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 15
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 16
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 17
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 18
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 19
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
  Plane 2
    Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
```



```
    PFE 3 :Links ok
FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 2
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 3
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 4
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 5
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 6
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 7
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 8
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 9
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 10
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 11
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 12
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
```

```
        FPC 13
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 14
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 15
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 16
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 17
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 18
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
        FPC 19
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
Plane 3
...
```

show chassis fabric plane (MX2020 Router with MPC4E)

```
user@host > show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 9
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 10
          PFE 0 :Links ok
      FPC 14
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 19
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 1
```



```
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 9
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 10
          PFE 0 :Links ok
      FPC 14
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 19
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 9
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 10
          PFE 0 :Links ok
      FPC 14
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 19
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 9
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 10
          PFE 0 :Links ok
      FPC 14
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 19
          PFE 0 :Links ok
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
Plane 4
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
          PFE 1 :Links ok
      FPC 9
          PFE 0 :Links ok
          PFE 1 :Links ok
```

```
        FPC 10
            PFE 0 :Links ok
        FPC 14
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 19
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
  Plane 5
    Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 9
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 10
            PFE 0 :Links ok
        FPC 14
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 19
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
  Plane 6
    Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 9
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 10
            PFE 0 :Links ok
        FPC 14
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 19
            PFE 0 :Links ok
            PFE 1 :Links ok
            PFE 2 :Links ok
            PFE 3 :Links ok
  Plane 7
    Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 9
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 10
            PFE 0 :Links ok
        FPC 14
            PFE 0 :Links ok
            PFE 1 :Links ok
        FPC 19
            PFE 0 :Links ok
```

```
          PFE 1 :Links ok
          PFE 2 :Links ok
          PFE 3 :Links ok
```

show chassis fabric plane (TX Matrix Plus Router)

```
user@host> show chassis fabric plane
sfc0-re0:
---------------------------------------------------------------------------
Plane  State              Link errors  Destination errors  Uptime
 0     Spare                 NONE             NONE
 1     Online                NONE             NONE          10 hours, 16 seconds
 2     Online                NONE             NONE          10 hours, 13 seconds
 3     Online                NONE             NONE          10 hours, 9 seconds
 4     Online                NONE             NONE          10 hours, 7 seconds

lcc0-re0:
---------------------------------------------------------------------------
SIB    State              Link errors  Destination errors  Uptime
 0     Spare                 NONE             NONE
 1     Online                NONE             NONE          10 hours, 16 seconds
 2     Online                NONE             NONE          10 hours, 13 seconds
 3     Online                NONE             NONE          10 hours, 9 seconds
 4     Online                NONE             NONE          10 hours, 7 seconds
lcc2-re0:
---------------------------------------------------------------------------
SIB    State              Link errors  Destination errors  Uptime
 0     Spare                 NONE             NONE
 1     Online                NONE             NONE          10 hours, 16 seconds
 2     Online                NONE             NONE          10 hours, 12 seconds
 3     Online                NONE             NONE          10 hours, 9 seconds
 4     Online                NONE             NONE          10 hours, 7 seconds
```

show chassis fabric plane (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane
sfc0-re0:
---------------------------------------------------------------------------
Plane  State        Cable errors   Link errors   Destination errors  Uptime
 0     Spare           NONE           NONE              NONE
 1     Online          NONE           NONE              NONE          5 hours, 11
 minutes, 3 seconds
 2     Online          NONE           NONE              NONE          8 hours, 4
minutes, 24 seconds
 3     Online          NONE           NONE              NONE          8 hours, 3
minutes, 16 seconds
 4     Online          NONE           NONE              NONE          8 hours, 2
minutes, 12 seconds

lcc2-re0:
---------------------------------------------------------------------------
SIB    State        Cable errors   Link errors   Destination errors  Uptime
 0     Spare           NONE           NONE              NONE
 1     Online          NONE           NONE              NONE          5 hours, 11
 minutes, 3 seconds
 2     Online          NONE           NONE              NONE          8 hours, 4
minutes, 57 seconds
 3     Online          NONE           NONE              NONE          8 hours, 3
minutes, 53 seconds
 4     Online          NONE           NONE              NONE          8 hours, 2
minutes, 45 seconds
```



```
lcc4-re0:
--------------------------------------------------------------------------
SIB    State        Cable errors   Link errors   Destination errors  Uptime
 0     Spare            NONE          NONE            NONE
 1     Online           NONE          NONE            NONE          5 hours, 11
 minutes, 12 seconds
 2     Online           NONE          NONE            NONE          8 hours, 4
minutes, 24 seconds
 3     Online           NONE          NONE            NONE          8 hours, 3
minutes, 16 seconds
 4     Online           NONE          NONE            NONE          8 hours, 2
minutes, 12 seconds

lcc5-re0:
--------------------------------------------------------------------------
SIB    State        Cable errors   Link errors   Destination errors  Uptime
 0     Spare            NONE          NONE            NONE
 1     Online           NONE          NONE            NONE          5 hours, 11
 minutes, 12 seconds
 2     Online           NONE          NONE            NONE          8 hours, 4
minutes, 24 seconds
 3     Online           NONE          NONE            NONE          8 hours, 3
minutes, 15 seconds
 4     Online           NONE          NONE            NONE          8 hours, 2
minutes, 11 seconds
```

show chassis fabric plane detail (TX Matrix Plus Router)

```
user@host> show chassis fabric plane detail
sfc0-re0:
--------------------------------------------------------------------------
Fabric Management PLANE State:
PLANE 0:    Spare
   SIB F13 0   :    Spare
   SIB F13 1   :    Empty
   SIB F2S 0/0 :    Spare
   SIB F2S 0/2 :    Spare
   SIB F2S 0/4 :    Spare
   SIB F2S 0/6 :    Spare
PLANE 1:    Online
   SIB F13 3   :    Online
   SIB F13 4   :    Empty
   SIB F2S 1/0 :    Online
   SIB F2S 1/2 :    Online
   SIB F2S 1/4 :    Online
   SIB F2S 1/6 :    Online
PLANE 2:    Online
   SIB F13 6   :    Online
   SIB F13 7   :    Empty
   SIB F2S 2/0 :    Online
   SIB F2S 2/2 :    Online
   SIB F2S 2/4 :    Online
   SIB F2S 2/6 :    Online
PLANE 3:    Online
   SIB F13 8   :    Online
   SIB F13 9   :    Online
   SIB F2S 3/0 :    Online
   SIB F2S 3/2 :    Online
   SIB F2S 3/4 :    Online
   SIB F2S 3/6 :    Online
```

```
PLANE 4:    Online
   SIB F13 11  :    Online
   SIB F13 12  :    Online
   SIB F2S 4/0 :    Online
   SIB F2S 4/2 :    Online
   SIB F2S 4/4 :    Online
   SIB F2S 4/6 :    Online

lcc0-re0:
--------------------------------------------------------------------------
Fabric Management SIB State:
   SIB     0   :    Spare
   SIB     1   :    Online
   SIB     2   :    Online
   SIB     3   :    Online
   SIB     4   :    Online

lcc1-re0:
--------------------------------------------------------------------------
Fabric Management SIB State:
   SIB     0   :    Spare
   SIB     1   :    Online
   SIB     2   :    Online
   SIB     3   :    Online
   SIB     4   :    Online
...
```

show chassis fabric plane extensive (TX Matrix Plus Router)

```
user@host> show chassis fabric plane extensive
sfc0-re0:
--------------------------------------------------------------------------
Fabric Management PLANE State:
PLANE 0:    Spare
   SIB F13 0   :    Spare
   SIB F13 1   :    Empty
   SIB F2S 0/0 :    Spare
   SIB F2S 0/2 :    Spare
   SIB F2S 0/4 :    Spare
   SIB F2S 0/6 :    Spare
   SIB F13 0 Even:
        LCC 0, SIB 0 : Links ok
            SG 0
                Port 0    : Links ok
                Port 1    : Links ok
                Port 2    : Links ok
                Port 3    : Links ok
            SG 1
                Port 0    : Links ok
                Port 1    : Links ok
                Port 2    : Links ok
                Port 3    : Links ok
            SG 2
                Port 0    : Links ok
                Port 1    : Links ok
                Port 2    : Links ok
                Port 3    : Links ok
            SG 3
                Port 0    : Links ok
                Port 1    : Links ok
                Port 2    : Links ok
```

```
                Port 3    : Links ok
SIB F13 0 Odd:
     LCC 1, SIB 0 : Links ok
         SG 0
             Port 0    : Links ok
             Port 1    : Links ok
             Port 2    : Links ok
             Port 3    : Links ok
         SG 1
             Port 0    : Links ok
             Port 1    : Links ok
             Port 2    : Links ok
             Port 3    : Links ok
         SG 2
             Port 0    : Links ok
             Port 1    : Links ok
             Port 2    : Links ok
             Port 3    : Links ok
         SG 3
             Port 0    : Links ok
             Port 1    : Links ok
             Port 2    : Links ok
             Port 3    : Links ok
     SIB F2S 0/0: Links ok
     SIB F2S 0/2: Links ok
     SIB F2S 0/4: Links ok
     SIB F2S 0/6: Links ok
SIB F13 1 Even:
     LCC 2, SIB 0 : Unused
         SG 0
             Port 0    : Unused
             Port 1    : Unused
             Port 2    : Unused
             Port 3    : Unused
         SG 1
             Port 0    : Unused
             Port 1    : Unused
             Port 2    : Unused
             Port 3    : Unused
         SG 2
             Port 0    : Unused
             Port 1    : Unused
             Port 2    : Unused
             Port 3    : Unused
         SG 3
             Port 0    : Unused
             Port 1    : Unused
             Port 2    : Unused
             Port 3    : Unused
SIB F13 1 Odd:
     LCC 3, SIB 0 : Unused
         SG 0
             Port 0    : Unused
             Port 1    : Unused
             Port 2    : Unused
             Port 3    : Unused
         SG 1
             Port 0    : Unused
             Port 1    : Unused
             Port 2    : Unused
             Port 3    : Unused
```



```
                SG 2
                    Port 0    : Unused
                    Port 1    : Unused
                    Port 2    : Unused
                    Port 3    : Unused
                SG 3
                    Port 0    : Unused
                    Port 1    : Unused
                    Port 2    : Unused
                    Port 3    : Unused
            SIB F2S 0/0: Unused
            SIB F2S 0/2: Unused
            SIB F2S 0/4: Unused
            SIB F2S 0/6: Unused
PLANE 1:    Online
   SIB F13 3   :    Online
   SIB F13 4   :    Empty
   SIB F2S 1/0 :    Online
   SIB F2S 1/2 :    Online
   SIB F2S 1/4 :    Online
   SIB F2S 1/6 :    Online
   SIB F13 3 Even:
...
```

show chassis fabric plane extensive (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane extensive
sfc0-re0:
--------------------------------------------------------------------------
Fabric Management PLANE State:
PLANE 0:    Online
   SIB F13 0   :    Empty
   SIB F13 1   :    Online
   SIB F2S 0/0 :    Online
   SIB F2S 0/2 :    Online
   SIB F2S 0/4 :    Online
   SIB F2S 0/6 :    Online
   SIB F13 0
        LCC 0, SIB 0 : Unused
            PFE 0    : Unused
            PFE 1    : Unused
            PFE 2    : Unused
            PFE 3    : Unused
            PFE 4    : Unused
            PFE 5    : Unused
            PFE 6    : Unused
            PFE 7    : Unused
            PFE 8    : Unused
            PFE 9    : Unused
            PFE 10   : Unused
            PFE 11   : Unused
            PFE 12   : Unused
            PFE 13   : Unused
            PFE 14   : Unused
            PFE 15   : Unused
        LCC 1, SIB 0 : Unused
            PFE 0    : Unused
            PFE 1    : Unused
            PFE 2    : Unused
            PFE 3    : Unused
            PFE 4    : Unused
```

```
              PFE 5   : Unused
              PFE 6   : Unused
              PFE 7   : Unused
              PFE 8   : Unused
              PFE 9   : Unused
              PFE 10  : Unused
              PFE 11  : Unused
              PFE 12  : Unused
              PFE 13  : Unused
              PFE 14  : Unused
              PFE 15  : Unused
          LCC 2, SIB 0 : Unused
              PFE 0   : Unused
              PFE 1   : Unused
              PFE 2   : Unused
              PFE 3   : Unused
              PFE 4   : Unused
              PFE 5   : Unused
              PFE 6   : Unused
              PFE 7   : Unused
              PFE 8   : Unused
              PFE 9   : Unused
              PFE 10  : Unused
...
lcc5-re0:
--------------------------------------------------------------------------
Fabric Management SIB State:
   SIB     0   :    Online
        LCC SIB Link State : Links ok
           PFE 0   : Links ok
           PFE 1   : Links ok
           PFE 2   : Links ok
           PFE 3   : Links ok
           PFE 4   : Links ok
           PFE 5   : Links ok
           PFE 6   : Links ok
           PFE 7   : Links ok
           PFE 8   : Links ok
           PFE 9   : Links ok
           PFE 10  : Links ok
           PFE 11  : Links ok
           PFE 12  : Links ok
           PFE 13  : Links ok
           PFE 14  : Links ok
           PFE 15  : Links ok
           FPC 1
               PFE 0     : Links ok
           FPC 2
               PFE 0     : Links ok
           FPC 3
               PFE 0     : Links ok
               PFE 1     : Links ok
           FPC 4
               PFE 0     : Links ok
   SIB     1   :    Online
        LCC SIB Link State : Links ok
           PFE 0   : Links ok
           PFE 1   : Links ok
           PFE 2   : Links ok
           PFE 3   : Links ok
           PFE 4   : Links ok
```



```
PFE 5   : Links ok
PFE 6   : Links ok
PFE 7   : Links ok
PFE 8   : Links ok
PFE 9   : Links ok
PFE 10  : Links ok
PFE 11  : Links ok
PFE 12  : Links ok
PFE 13  : Links ok
PFE 14  : Links ok
PFE 15  : Links ok
FPC 1
    PFE 0     : Links ok
FPC 2
    PFE 0     : Links ok
FPC 3
    PFE 0     : Links ok
    PFE 1     : Links ok
FPC 4
    PFE 0     : Links ok
```

show chassis fabric plane terse (TX Matrix Plus Router)

```
user@host> show chassis fabric plane terse
sfc0-re0:
--------------------------------------------------------------------------
Plane  State              Link errors  Destination errors  Uptime
 0     Spare                 NONE            NONE
 1     Online               NONE            NONE          18 minutes, 37 seconds

 2     Online               NONE            NONE          18 minutes, 36 seconds

 3     Online               NONE            NONE          18 minutes, 33 seconds

 4     Online               NONE            NONE          18 minutes, 31 seconds

lcc1-re0:
--------------------------------------------------------------------------
SIB    State              Link errors  Destination errors  Uptime
 0     Spare                 NONE            NONE
 1     Online               NONE            NONE          18 minutes, 37 seconds

 2     Online                NONE            NONE
 3     Online                NONE            NONE
 4     Empty                 NONE            NONE

lcc2-re0:
--------------------------------------------------------------------------
SIB    State              Link errors  Destination errors  Uptime
 0     Spare                 NONE            NONE
 1     Online               NONE            NONE          18 minutes, 37 seconds

 2     Online               NONE            NONE          18 minutes, 36 seconds

 3     Online               NONE            NONE          18 minutes, 32 seconds

 4     Online               NONE            NONE          18 minutes, 31 seconds
```

show chassis fabric plane terse (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane terse
```

```
sfc0-re0:
--------------------------------------------------------------------------
Plane  State        Cable errors   Link errors   Destination errors  Uptime
 0     Offline          NONE          NONE              NONE
 1     Online           NONE          NONE              NONE          1 day, 18
hours, 14 minutes, 26 seconds
 2     Offline          NONE          NONE              NONE
 3     Offline          NONE          NONE              NONE
 4     Offline          NONE          NONE              NONE

lcc2-re0:
--------------------------------------------------------------------------
SIB    State        Cable errors   Link errors   Destination errors  Uptime
 0     Offline          NONE          NONE              NONE
 1     Online           NONE          NONE              NONE          1 day, 18
hours, 17 minutes
 2     Offline          NONE          NONE              NONE
 3     Offline          NONE          NONE              NONE
 4     Offline          NONE          NONE              NONE

lcc4-re0:
--------------------------------------------------------------------------
SIB    State        Cable errors   Link errors   Destination errors  Uptime
 0     Offline          NONE          NONE              NONE
 1     Online           NONE          NONE              NONE          1 day, 18
hours, 14 minutes, 38 seconds
 2     Offline          NONE          NONE              NONE
 3     Offline          NONE          NONE              NONE
 4     Offline          NONE          NONE              NONE

lcc5-re0:
--------------------------------------------------------------------------
SIB    State        Cable errors   Link errors   Destination errors  Uptime
 0     Offline          NONE          NONE              NONE
 1     Online           NONE          NONE              NONE          1 day, 18
hours, 14 minutes, 34 seconds
 2     Offline          NONE          NONE              NONE
 3     Offline          NONE          NONE              NONE
 4     Offline          NONE          NONE              NONE
```

show chassis fabric plane lcc (TX Matrix Plus Router)

```
user@host> show chassis fabric plane lcc 1
lcc1-re0:
--------------------------------------------------------------------------
SIB    State              Link errors  Destination errors  Uptime
 0     Spare                 NONE             NONE
 1     Online                NONE             NONE          25 minutes, 17 seconds

 2     Disconnected          NONE             NONE
 3     Disconnected          NONE             NONE
 4     Empty                 NONE             NONE
```

show chassis fabric plane lcc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane lcc 2
lcc2-re0:
--------------------------------------------------------------------------
SIB    State        Cable errors   Link errors   Destination errors  Uptime
 0     Offline          NONE          NONE              NONE
 1     Online           NONE          NONE              NONE          1 day, 18
```



```
hours, 16 minutes, 44 seconds
 2      Offline          NONE          NONE              NONE
 3      Offline          NONE          NONE              NONE
 4      Offline          NONE          NONE              NONE
```

show chassis fabric plane sfc (TX Matrix Plus Router)

```
user@host> show chassis fabric plane sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Plane  State                Link errors  Destination errors  Uptime
 0     Spare                   NONE             NONE
 1     Online                  NONE             NONE         27 minutes, 7 seconds

 2     Online                  NONE             NONE         27 minutes, 6 seconds

 3     Online                  NONE             NONE         27 minutes, 3 seconds

 4     Online                  NONE             NONE         27 minutes, 1 second
```

show chassis fabric plane sfc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Plane  State        Cable errors   Link errors   Destination errors  Uptime
 0     Offline          NONE          NONE              NONE
 1     Online           NONE          NONE              NONE         1 day, 18
hours, 14 minutes, 20 seconds
 2     Offline          NONE          NONE              NONE
 3     Offline          NONE          NONE              NONE
 4     Offline          NONE          NONE              NONE
```

show chassis fabric plane (T1600 Router)

```
user@host> show chassis fabric plane
Plane  State                      Uptime
 0    Online                      15 hours, 42 minutes, 9 seconds
 1    Online                      15 hours, 42 minutes, 9 seconds
 2    Fault
 3    Online                      15 hours, 42 minutes, 9 seconds
 4    Online                      15 hours, 42 minutes, 9 seconds
```

show chassis fabric plane extensive (T1600 Router)

```
user@host> show chassis fabric plane extensive
Fabric Management PLANE State:
PLANE 0:     Online
   ST-SIB-L  0: Links ok
     SG 0
         Port 0     : Links ok
         Port 1     : Links ok
         Port 2     : Links ok
         Port 3     : Links ok
     SG 1
         Port 0     : Links ok
         Port 1     : Links ok
         Port 2     : Links ok
         Port 3     : Links ok
     SG 2
         Port 0     : Links ok
         Port 1     : Links ok
```

```
          Port 2    : Links ok
          Port 3    : Links ok
      SG 3
          Port 0    : Links ok
          Port 1    : Links ok
          Port 2    : Links ok
          Port 3    : Links ok
    ST-SIB-L 0
        FPC 4
            PFE 0: Links ok
            PFE 1: Links ok
        FPC 6
            PFE 0: Links ok
            PFE 1: Links ok
        FPC 7
            PFE 0: Links ok
 PLANE 1:    Online
    ST-SIB-L  1: Links ok
      SG 0
          Port 0    : Links ok
          Port 1    : Links ok
          Port 2    : Links ok
          Port 3    : Links ok
      SG 1
          Port 0    : Links ok
          Port 1    : Links ok
          Port 2    : Links ok
          Port 3    : Links ok
      SG 2
          Port 0    : Links ok
          Port 1    : Links ok
          Port 2    : Links ok
          Port 3    : Links ok
      SG 3
          Port 0    : Links ok
          Port 1    : Links ok
          Port 2    : Links ok
          Port 3    : Links ok
    ST-SIB-L 1
        FPC 4
            PFE 0: Links ok
            PFE 1: Links ok
        FPC 6
            PFE 0: Links ok
            PFE 1: Links ok
        FPC 7
            PFE 0: Links ok
 PLANE 2:    Online
    ST-SIB-L  2: Links ok
      SG 0
          Port 0    : Links ok
          Port 1    : Links ok
          Port 2    : Links ok
          Port 3    : Links ok
      SG 1
          Port 0    : Links ok
          Port 1    : Links ok
          Port 2    : Links ok
          Port 3    : Links ok
      SG 2
          Port 0    : Links ok
```



```
            Port 1    : Links ok
            Port 2    : Links ok
            Port 3    : Links ok
        SG 3
            Port 0    : Links ok
            Port 1    : Links ok
            Port 2    : Links ok
            Port 3    : Links ok
      ST-SIB-L 2
          FPC 4
              PFE 0: Links ok
              PFE 1: Links ok
          FPC 6
              PFE 0: Links ok
              PFE 1: Links ok
          FPC 7
              PFE 0: Links ok
   PLANE 3:    Spare
      ST-SIB-L  3: Links ok
        SG 0
            Port 0    : Links ok
            Port 1    : Links ok
            Port 2    : Links ok
            Port 3    : Links ok
        SG 1
            Port 0    : Links ok
            Port 1    : Links ok
            Port 2    : Links ok
            Port 3    : Links ok
        SG 2
            Port 0    : Links ok
            Port 1    : Links ok
            Port 2    : Links ok
            Port 3    : Links ok
        SG 3
            Port 0    : Links ok
            Port 1    : Links ok
            Port 2    : Links ok
            Port 3    : Links ok
      ST-SIB-L 3
          FPC 4
              PFE 0: Links ok
              PFE 1: Links ok
          FPC 6
              PFE 0: Links ok
              PFE 1: Links ok
          FPC 7
              PFE 0: Links ok
   PLANE 4:    Online
      ST-SIB-L  4: Links ok
        SG 0
            Port 0    : Links ok
            Port 1    : Links ok
            Port 2    : Links ok
            Port 3    : Links ok
        SG 1
            Port 0    : Links ok
            Port 1    : Links ok
            Port 2    : Links ok
            Port 3    : Links ok
        SG 2
```

```
            Port 0    : Links ok
            Port 1    : Links ok
            Port 2    : Links ok
            Port 3    : Links ok
        SG 3
            Port 0    : Links ok
            Port 1    : Links ok
            Port 2    : Links ok
            Port 3    : Links ok
      ST-SIB-L 4
          FPC 4
              PFE 0: Links ok
              PFE 1: Links ok
          FPC 6
              PFE 0: Links ok
              PFE 1: Links ok
          FPC 7
              PFE 0: Links ok
```

show chassis fabric plane detail (T1600 Router)

```
user@host> show chassis fabric plane detail
Fabric Management PLANE State:
PLANE 0:    Online
PLANE 1:    Online
PLANE 2:    Online
PLANE 3:    Spare
PLANE 4:    Online
```

show chassis fabric plane (EX8200 Switch)

```
user@host> show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
Plane 1
  Plane state: ACTIVE
Plane 2
  Plane state: ACTIVE
Plane 3
  Plane state: ACTIVE
Plane 4
  Plane state: SPARE
Plane 5
  Plane state: SPARE
Plane 6
  Plane state: SPARE
Plane 7
  Plane state: SPARE
Plane 8
  Plane state: ACTIVE
Plane 9
  Plane state: ACTIVE
Plane 10
  Plane state: ACTIVE
Plane 11
  Plane state: ACTIVE
```


show chassis fabric plane-location

List of Syntax

Syntax

```
show chassis fabric plane-location
```

Syntax (MX Series Routers)

show chassis fabric plane-location
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

```
show chassis fabric plane-location
```

Syntax (MX2020 3D Universal Edge Routers)

```
show chassis fabric plane-location
```

Syntax (TX Matrix Plus Router)

```
show chassis fabric plane-location
```

Release Information

Command introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.4 for EX Series switches.
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

(M120, MX Series routers, and EX8200 switches only) Display the Control Board (CB) location of each plane. This command can be used on the master Routing Engine or the backup Routing Engine. For information about the meaning of “CBs” and “fabric plane” on the switches, see *EX Series Switches Hardware and CLI Terminology Mapping*.

(TX Matrix Plus routers only) Display the SIB location of each fabric plane.

(PTX Series Packet Transport Routers only) Display the fabric plane location of each SIB.

(MX2010 and MX2020 Routers only) Display the fabric plane location of each Switch Fabric Board (SFB).

Options

all-members—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in all member routers in the Virtual Chassis configuration.

local—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in the specified member in the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

Required Privilege Level

view

List of Sample Output

show chassis fabric plane-location (M120 Router) on page 1121
show chassis fabric plane-location (MX240 and MX480 Routers) on page 1121
show chassis fabric plane-location (MX960 Router) on page 1121
show chassis fabric plane-location (MX2010 Router) on page 1121
show chassis fabric plane-location (MX2020 Router) on page 1121
show chassis fabric plane-location (TX Matrix Plus Router) on page 1122
show chassis fabric plane-location (TX Matrix Plus Router with 3D SIBs) on page 1122
show chassis fabric plane-location (EX8200 Switch) on page 1122
show chassis fabric plane-location (PTX Series Packet Transport Routers) on page 1122

Output Fields

Table 75 on page 1120 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 75: show chassis fabric plane-location Output Fields

Field Name	Field Description
Plane ***n***	Plane number. (PTX Series Packet Transport Routers only) Plane numbers associated with the SIB. (MX2010 and MX2020 Routers only) Plane numbers associated with the SFB.
Control Board ***n***	Control board number.
SFC ABS-SIB-F13	(TX Matrix Plus routers only) Switch Interface Board (SIB) slot number on the F13 SIB.
SFC ABS-SIB-F2S	(TX Matrix Plus routers only) SIB slot number on the F2S SIB.
LCC ST-SIB-L	(TX Matrix Plus routers only) Line-card chassis (LCC) SIB slot number.
SFC SIB F13	(TX Matrix Plus routers with 3D SIBs only) Switch Interface Board (SIB) slot number on the F13 SIB.
SFC SIB F2S	(TX Matrix Plus routers with 3D SIBs only) SIB slot number on the F2S SIB.
LCC SIB	(TX Matrix Plus routers with 3D SIBs only) Line-card chassis (LCC) SIB slot number.
SIB	(PTX Series Packet Transport Routers only) SIB number.

Table 75: show chassis fabric plane-location Output Fields *(continued)*

Field Name	Field Description
Switch Fabric Board *n*	(MX2010 and MX2020 Routers only) SFB number.

Sample Output

show chassis fabric plane-location (M120 Router)

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
Plane 0                         Control Board 0
Plane 1                         Control Board 0
Plane 2                         Control Board 1
Plane 3                         Control Board 1
```

show chassis fabric plane-location (MX240 and MX480 Routers)

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
Plane 0                         Control Board 0
Plane 1                         Control Board 0
Plane 2                         Control Board 0
Plane 3                         Control Board 0
Plane 4                         Control Board 1
Plane 5                         Control Board 1
Plane 6                         Control Board 1
Plane 7                         Control Board 1
```

show chassis fabric plane-location (MX960 Router)

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
Plane 0                         Control Board 0
Plane 1                         Control Board 0
Plane 2                         Control Board 1
Plane 3                         Control Board 1
Plane 4                         Control Board 2
Plane 5                         Control Board 2
```

show chassis fabric plane-location (MX2010 Router)

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
Plane 0              Switch Fabric Board 0
Plane 1              Switch Fabric Board 1
Plane 2              Switch Fabric Board 2
Plane 3              Switch Fabric Board 3
Plane 4              Switch Fabric Board 4
Plane 5              Switch Fabric Board 5
Plane 6              Switch Fabric Board 6
Plane 7              Switch Fabric Board 7
```

show chassis fabric plane-location (MX2020 Router)

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
Plane 0              Switch Fabric Board 0
Plane 1              Switch Fabric Board 1
```



```
Plane 2              Switch Fabric Board 2
Plane 3              Switch Fabric Board 3
Plane 4              Switch Fabric Board 4
Plane 5              Switch Fabric Board 5
Plane 6              Switch Fabric Board 6
Plane 7              Switch Fabric Board 7
```

show chassis fabric plane-location (TX Matrix Plus Router)

```
user@host> show chassis fabric plane-location
Fabric Plane Locations :
Plane       SFC ABS-SIB-F13        SFC ABS-SIB-F2        LCC ST-SIB-L
 0             0, 1              0/0, 0/2, 0/4, 0/6          0
 1             3, 4              1/0, 1/2, 1/4, 1/6          1
 2             6, 7              2/0, 2/2, 2/4, 2/6          2
 3             8, 9              3/0, 3/2, 3/4, 3/6          3
 4             11, 12            4/0, 4/2, 4/4, 4/6          4
```

show chassis fabric plane-location (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane-location
sfc0-re0
--------------------------------------------------------------------------------
------------Fabric Plane Locations------------
Plane       SFC SIB F13            SFC SIB F2               LCC SIB
 0             0, 1              0/0, 0/2, 0/4, 0/6          0
 1             3, 4              1/0, 1/2, 1/4, 1/6          1
 2             6, 7              2/0, 2/2, 2/4, 2/6          2
 3             8, 9              3/0, 3/2, 3/4, 3/6          3
 4             11, 12            4/0, 4/2, 4/4, 4/6          4
```

show chassis fabric plane-location (EX8200 Switch)

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
Plane  0                      Control Board 0
Plane  1                      Control Board 0
Plane  2                      Control Board 0
Plane  3                      Control Board 0
Plane  4                      Control Board 1
Plane  5                      Control Board 1
Plane  6                      Control Board 1
Plane  7                      Control Board 1
Plane  8                      Control Board 2
Plane  9                      Control Board 2
Plane 10                      Control Board 2
Plane 11                      Control Board 2
```

show chassis fabric plane-location (PTX Series Packet Transport Routers)

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
SIB            Planes
 0              0    1
 1              2    3
 2              4    5
 3              6    7
 4              8    9
 5             10   11
 6             12   13
 7             14   15
 8             16   17
```

show chassis fabric redundancy-mode

Syntax show chassis fabric redundancy-mode

Release Information Command introduced in Junos OS Release 12.2.

Description (MX240, MX480, and MX960 routers only) Display whether redundancy mode is configured for active control boards to enable increased fabric bandwidth usage.

Options This command has no options.

Required Privilege Level view

Related Documentation

- Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 358
- Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 353
- Corrective Actions for Fabric Failures on MX Series Routers on page 356
- **redundancy-mode on page 561**
- Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 361

List of Sample Output show chassis fabric redundancy-mode on page 1124

Output Fields Table 76 on page 1124 lists the output fields for the **show chassis fabric redundancy-mode** command. Output fields are listed in the approximate order in which they appear.

Table 76: show chassis fabric redundancy mode Output Fields

Field name	Field Description
Fabric redundancy mode	Currently configured mode of the fabric

Sample Output

show chassis fabric redundancy-mode

```
user@host> show chassis fabric redundancy-mode
Fabric redundancy mode: Redundant Fabric
```


show chassis fabric reachability

Syntax

show chassis fabric reachability
<detail>

Release Information

Command introduced before Junos OS Release 11.4.
Command introduced in Junos OS Release 12.1 for MX240, MX480, and MX960 routers.
Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Switches.
Command introduced in Junos OS Release 13.1R3 for TX Matrix routers.

Description

(M320, MX240, MX480, MX960, and T Series routers only) Display the current state of fabric destination reachability. Additionally, display the details of the automated actions taken by the system to stop blackholing and attempt healing, and the final resolution of the actions.

Options

none—Display the state of fabric destination reachability for M320, MX240, MX480, MX960, T640, T1600, and TX Matrix routers, based on periodic reachability checks. Display the system's action phase sequences to stop the black hole and attempt healing, and the final resolution.

detail—(Optional) Display the details of the actions carried out by the system in the different action phases and the final resolution.

Required Privilege Level

view

Related Documentation

- show chassis fabric unreachable-destinations on page 1180

List of Sample Output

show chassis fabric reachability (T640 and T1600 routers) on page 1129
show chassis fabric reachability detail (T640 and T1600 routers) on page 1129
show chassis fabric reachability (PTX5000 system) on page 1130
show chassis fabric reachability (TX Matrix router) on page 1130
show chassis fabric reachability detail (TX Matrix router) on page 1131

Output Fields

The table lists the output fields for the **show chassis fabric reachability** command. Output fields are listed in the approximate order in which they appear.

Table 77: show chassis fabric reachability Output Fields

Field Name	Field Description	Level of Output
Fabric reachability status	Display the reachability status of the fabric. • **Enabled destinations transitioned to unreachable, Fabric down action in progress**—Some enabled destinations that were originally reachable have become unreachable. The system is trying to stop the fabric down condition and attempt healing. • **Enabled destinations reachable**—The enabled destinations are reachable. • **Unreachable destinations healed**—The unreachable destinations are healed and are reachable. • **Unreachable destinations removed**—The unreachable destinations are removed. • **Unreachable destinations present**—Unreachable destinations are present in the system. • **Unreachable destinations present due to FPC restart disable configuration**—Unreachable destinations are present as a result of user configuration set to disable FPC restart.	All levels
Unreachable destinations	Number of FPCs that have unreachable destinations.	All levels
Detected on	Date and time when unreachable destinations are detected.	All levels
Reason	Reason for the destination turning unreachable. • **Single FPC error**—A single bad FPC is not reachable over the fabric. • **Fabric plane error**—Multiple FPCs are not able to forward traffic over the fabric planes.	All levels
Fabric reachability action	Action taken to handle the unreachable destination. • **Plane Action**—The healing is attempted only for the fabric planes. • **SIB Action**—(PTX Series system only) The healing is attempted only for the SIBs. • **Plane and FPC Action**—The healing is attempted both for the fabric planes and the FPCs. • **SIB and FPC Action**—(PTX Series system only) The healing is attempted both for the SIBs and the FPCs. • **FPC Action**—The healing is attempted only for the bad FPCs.	All levels
Acting on	Current action is being performed on: • **Single FPC error**—The current operation is for healing the single bad FPC. • **Fabric Plane error**—The current operation is for healing the fabric planes.	All levels

Table 77: show chassis fabric reachability Output Fields *(continued)*

Field Name	Field Description	Level of Output
Initial phase	Starting phase for the healing action. • **Plane restart**—The fabric planes are restarted. • **SIB restart**—(PTX Series system only) The SIBs are restarted. • **Plane and FPC restart**—Both the fabric planes and affected FPCs are restarted. • **SIB and FPC restart**—(PTX Series system only) SIBs and affected FPCs are restarted.	All levels
Current phase	Current phase for the healing action. • **Plane restart**—The fabric planes are restarted. • **SIB restart**—(PTX Series system only) The SIBs are restarted. • **Plane and FPC restart**—Both the fabric planes and affected FPCs are restarted. • **SIB and FPC restart**—(PTX Series system only) Both the SIBs and affected FPCs are restarted. • **FPC offline**—The FPCs are turned offline because the previously mentioned healing processes have failed.	All levels
Action started	Date and time when the system fabric down healing attempt is started.	All levels
Plane restart phase	The status of the plane restart phase. • **Completed**—The plane restart phase is completed. • **In progress**—The plane restart phase is in progress.	**detail**
Phase started	Date and time when the plane restart phase is started.	**detail**
Planes restarted	List of plane numbers restarted by the system.	**detail**
Planes timed out	List of plane numbers that have timed out waiting to be restarted by the system.	**detail**
Planes being offlined / onlined	Planes that are turned offline or turned online by the system, with date and time.	**detail**
Phase completed	Date and time when the plane restart phase is completed.	**detail**
Plane and FPC Restart Phase	Status of the plane and FPC restart phase. • **Completed**—The plane and FPC restart phase is completed. • **In progress**—The plane and FPC restart phase is in progress.	**detail**
Phase started	Date and time when the plane and FPC restart phase is started.	**detail**
FPC Offline Started	Date and time when the FPC offline action is started.	**detail**
Offlined FPCs	List of FPCs that are turned offline by the system.	**detail**

Table 77: show chassis fabric reachability Output Fields *(continued)*

Field Name	Field Description	Level of Output
FPCs timed out	List of FPCs that have timed out waiting to be turned offline by the system.	**detail**
FPC being offlined	FPC that is being turned offline by the system, with date and time.	**detail**
FPC Offline completed	Date and time when the FPC offline action is completed.	**detail**
Plane restarting started	Date and time when the plane restart action is started.	**detail**
Planes restarted	List of planes restarted by the system.	**detail**
Planes being offlined / onlined	Planes that are currently being turned offline or turned online by the system, with date and time.	**detail**
Plane restarting completed	Date and time when the plane restarting action is completed.	**detail**
FPC online started	Date and time when FPC online action is started.	**detail**
Onlined FPCs	List of FPCs that are turned online by the system.	**detail**
FPCs timed out	FPCs that have timed out waiting to be turned online by the system.	**detail**
FPC being onlined	FPC that is being turned online by the system, with date and time.	**detail**
FPC Online completed	Date and time when the action of turning the FPCs online is completed.	**detail**
Phase Completed	Date and time when the plane and FPC restart phase is completed.	**detail**
Phase started	Date and time when the plane and FPC restart phase is started.	**detail**
FPC restart time	Date and time when the FPC restart action is started.	**detail**
FPC restarted	FPC that is restarted by the system, with date and time.	**detail**
Phase Completed	Date and time when the plane and FPC restart phase is completed.	**detail**
FPC Offline Phase	Status of the FPC offline phase. • **Completed**— The FPC offline phase is completed. • **In progress**—The FPC offline phase is currently in progress.	**detail**
Phase started	Date and time when the FPC offline phase is started.	**detail**
FPC Offline started	Date and time when the FPC offline action is started.	**detail**
Offlined FPCs	List of FPCs turned offline by the system.	**detail**
FPCs timed out	List of FPCs that have timed out waiting to be turned offline by the system.	**detail**

Table 77: show chassis fabric reachability Output Fields *(continued)*

Field Name	Field Description	Level of Output
FPC being offlined	FPC that is being turned offline by the system, with date and time.	**detail**
FPC Offline completed	Date and time when the FPC offline action is completed.	**detail**
Phase Completed	Date and time when the FPC offline phase is completed.	**detail**
Action Completed	Date and time when the system fabric down healing attempt is completed.	All levels
Fabric reachability resolution	Status after the healing actions are performed. • **Unreachable destinations healed after *phase name***—The unreachable destinations are healed after the healing actions are performed. The phase name indicates the last healing phase. • **Unreachable destinations removed by FPCs *FPC number* offline**—The unreachable destinations are removed by turning the FPCs offline. • **Unreachable destinations present on FPC/PFE *FPC/PFE number***—The unreachable destinations are present on the FPCs or Packet Forwarding Engines and need to be acted upon.	All levels

Sample Output

show chassis fabric reachability (T640 and T1600 routers)

```
user@host> show chassis fabric reachability
Fabric reachability status: Unreachable destinations removed

Fabric reachability detection:
    Unreachable destinations                : Present on 3 FPCs
        Detected on                         : 2010-11-22 15:19:45 PST
        Reason                              : Fabric plane error

Fabric reachability action:
    Fabric reachability action              : FPC action
    Acting on                               : Fabric plane error
    Initial phase                           : Plane restart
    Current phase                           : FPC offline is completed
    Action started                          : 2010-11-22 15:08:05 PST
    Action completed                        : 2010-11-22 15:19:45 PST

Fabric reachability resolution: Unreachable destinations removed by FPCs 2, 3, 5

 offline
```

show chassis fabric reachability detail (T640 and T1600 routers)

```
user@host> show chassis fabric reachability detail
Fabric reachability status: Unreachable destinations removed
Fabric reachability detection:
    Unreachable destinations                : Present on 3 FPCs
        Detected on                         : 2010-11-15 15:50:32 PST
        Reason                              : Fabric plane error
```

```
Fabric reachability action:
    Fabric reachability action             : FPC action
    Acting on                              : Fabric plane error
    Initial phase                          : Plane restart
    Current phase                          : FPC offline is completed
    Action started                         : 2010-11-15 15:41:47 PST
        Plane restart phase                : Completed
            Phase started                  : 2010-11-15 15:41:47 PST
                Planes restarted           : 0, 1, 2, 3, 4, 0
            Phase completed                : 2010-11-15 15:42:14 PST
        Plane and FPC Restart Phase        : Completed
            Phase started                  : 2010-11-15 15:45:52 PST
                FPC Offline Started        : 2010-11-15 15:45:52 PST
                    Offlined FPCs          : 2, 3, 5, 7
                FPC Offline completed      : 2010-11-15 15:45:52 PST
                Plane restarting started   : 2010-11-15 15:45:52 PST
                    Planes restarted       : 0, 1, 2, 3, 4, 0
                Plane restarting completed : 2010-11-15 15:46:11 PST
                FPC online started         : 2010-11-15 15:46:11 PST
                    Onlined FPCs           : 2, 3, 5, 7
                FPC online completed       : 2010-11-15 15:46:50 PST
            Phase completed                : 2010-11-15 15:46:50 PST
        FPC offline phase                  : Completed
            Phase started                  : 2010-11-15 15:50:32 PST
                FPC offline started        : 2010-11-15 15:50:32 PST
                    Offlined FPCs          : 2, 3, 5
                FPC offline completed      : 2010-11-15 15:50:32 PST
            Phase completed                : 2010-11-15 15:50:32 PST
    Action completed                       : 2010-11-15 15:50:32 PST

Fabric reachability resolution: Unreachable destinations removed by FPCs 2, 3, 5

 offline
```

show chassis fabric reachability (PTX5000 system)

```
user@host> show chassis fabric reachability
Fabric reachability status: Enabled destinations transitioned to unreachable,
Fabric down action in progress

Fabric reachability detection:
    Unreachable destinations               : Present on 5 FPCs
        Detected on                        : 2012-11-14 15:53:00 PST
        Reason                             : Fabric plane error

Fabric reachability action:
    Fabric reachability action             : SIB action
    Acting on                              : Fabric plane error
    Initial phase                          : SIB restart
    Current phase                          : SIB restart is in progress
    Action started                         : 2012-11-14 15:53:00 PST
```

show chassis fabric reachability (TX Matrix router)

```
user@host> show chassis fabric reachability
Fabric reachability status: Enabled destinations transitioned to unreachable,
Fabric down action in progress

Fabric reachability detection:
    Unreachable destinations               : Present on 14 FPCs
        Detected on                        : 2013-08-29 02:09:16 PDT
```



```
        Reason                               : Fabric plane error

Fabric reachability action:
    Fabric reachability action               : Plane action
    Acting on                                : Fabric plane error
    Initial phase                            : Plane restart
    Current phase                            : Plane restart is in progress
    Action started                           : 2013-08-29 02:09:16 PDT
```

show chassis fabric reachability detail (TX Matrix router)

```
user@host> show chassis fabric reachability detail
Fabric reachability status: Enabled destinations transitioned to unreachable,
Fabric down action in progress

Fabric reachability detection:
    Unreachable destinations                 : Present on 14 FPCs
        Detected on                          : 2013-08-29 02:09:16 PDT
        Reason                               : Fabric plane error

Fabric reachability action:
    Fabric reachability action               : Plane action
    Acting on                                : Fabric plane error
    Initial phase                            : Plane restart
    Current phase                            : Plane restart is in progress
    Action started                           : 2013-08-29 02:09:16 PDT
        Plane restart phase                  : In progress
            Phase started                    : 2013-08-29 02:09:16 PDT
                Planes restarted             : 0, 2, 3
                Planes being offlined        : 4 : 2013-08-29 02:10:11 PDT
```

show chassis fabric sibs

Syntax

show chassis fabric sibs
<lcc *number* | scc>
<slot *slot-number*>

Release Information

Command introduced before Junos OS Release 7.4.

Description

(TX Matrix routers only) Display the state of the electrical and optical switch fabric link between the SIBs in the TX Matrix router (TX-SIBs) and the SIBs in the T640 routers (T640 LCC SIBs).

(M320, T640, T1600, and T4000 routers) Display the state of the electrical switch fabric link between the SIBs and the FPCs.

(PTX Series routers) Display the state of the electrical switch fabric link between the SIBs and the FPCs.

Options

none—(TX Matrix routers only) Display the state of the electrical and optical switch fabric link between the SIBs in the TX Matrix router (TX-SIBs) and the SIBs in the T640 routers (T640 LCC SIBs).

(M320, T640, T1600, and T4000 routers) Display the state of the electrical switch fabric link between the SIBs and the FPCs.

(PTX Series routers) Display the state of the electrical switch fabric link between the SIBs and the FPCs.

lcc *number*—(Optional) Display the switching fabric link state for the T640 SIBs on a specified T640 router (line-card chassis) connected to a TX Matrix router.

scc—(Optional) Display the switching fabric link state for the TX-SIBs on the TX Matrix router (switch-card chassis).

slot *slot-number*—(Optional) Display the state of the electrical switch fabric link between the specified SIB slot and the FPCs.

Required Privilege Level

view

Related Documentation

- request chassis sib on page 659
- show chassis sibs on page 1519

- *Monitoring the SIBs*
- *Redundant SIBs Overview*

List of Sample Output

show chassis fabric sibs (M320 Router) on page 1133
show chassis fabric sibs (T640 Router) on page 1134
show chassis fabric sibs (T1600 Router) on page 1135
show chassis fabric sibs (T4000 Core Router) on page 1137

show chassis fabric sibs (TX Matrix Router) on page 1138
show chassis fabric sibs lcc (TX Matrix Router) on page 1140
show chassis fabric sibs scc (TX Matrix Router) on page 1141
show chassis fabric sibs slot (PTX3000 Router) on page 1141

Output Fields Table 78 on page 1133 lists the output fields for the **show chassis fabric sibs** command. Output fields are listed in the approximate order in which they appear.

Table 78: show chassis fabric sibs Output Fields

Field Name	Field Description
Fabric management SIB state	Switching fabric link (link from FPC to SIB) state for each SIB: • **Unused**—SIB is not present. • **Links ok**—Link between the SIB and the FPC is active. • **Link error**—Link between the SIB and the FPC is not operational.

Plane state	Possible plane state of the M320 SIB, TX-SIB or T640 SIB:
	• **S_ACTIVE**—Links on the SIB are operational, and the fabric plane (SIB) is operational and running.
	• **S_SPARE**—Links on the SIB are operational and the fabric plane (SIB) is redundant and can be operational if any of the fabric planes in the **S_ACTIVE** state encounters an error.
	NOTE: If the plane is unusable by any of the Packet Forwarding Engines, the command output displays an additional string, **plane has link errors on # pfes**, where, **#** indicates the total number of links (both from SIB to FPC, and from FPC to SIB) having link errors (detected either during initialization time or runtime) in this particular plane. This does not count links having destination errors.
	• **S_EMPTY**—No links are present on the SIB, and the fabric plane (SIB) is powered down.
	• **S_ACTIVATING**—Links on the SIB are coming online; this is a transitional state.
	• **S_DEACTIVATING**—Links on the SIB are going offline; this is a transitional state.
	• **S_FAULTING**—Links on the SIB are being marked faulty, and the fabric plane (SIB) is not operational.
	• **S_FAULT**—Links on the SIB are in an alarmed state, and the fabric plane (SIB) is not operational for the following reasons:
	  ◦ On-board F-chip is not operational.
	  ◦ Fiber optic connector faults.
	  ◦ FPC connector faults.

Sample Output

show chassis fabric sibs (M320 Router)

```
user@host> show chassis fabric sibs
Fabric management SIB state:
SIB #0
    plane state: S_ACTIVE
```

```
    FPC #0
        PFE #1  : Links ok
    FPC #1
        PFE #1  : Links ok
    FPC #2
        PFE #1  : Links ok
    FPC #3
        PFE #1  : Links ok
SIB #1
    plane state: S_ACTIVE
    FPC #0
        PFE #1  : Links ok
    FPC #1
        PFE #1  : Links ok
    FPC #2
        PFE #1  : Links ok
    FPC #3
        PFE #1  : Links ok
SIB #2
    plane state: S_ACTIVE
    FPC #0
        PFE #1  : Links ok
    FPC #1
        PFE #1  : Links ok
    FPC #2
        PFE #1  : Links ok
    FPC #3
        PFE #1  : Links ok
SIB #3
    plane state: S_ACTIVE
    FPC #0
        PFE #1  : Links ok
    FPC #1
        PFE #1  : Links ok
    FPC #2
        PFE #1  : Links ok
    FPC #3
        PFE #1  : Links ok
```

show chassis fabric sibs (T640 Router)

```
user@host> show chassis fabric sibs
Fabric management SIB state:
SIB #0
    plane state: S_SPARE
    FPC #0
        PFE #1  : Links ok
    FPC #2
        PFE #1  : Links ok
    FPC #3
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #1
    plane state: S_ACTIVE
    FPC #0
        PFE #1  : Links ok
    FPC #2
        PFE #1  : Links ok
    FPC #3
        PFE #0  : Links ok
        PFE #1  : Links ok
```

```
SIB #2
    plane state: S_ACTIVE
    FPC #0
        PFE #1  : Links ok
    FPC #2
        PFE #1  : Links ok
    FPC #3
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #3
    plane state: S_ACTIVE
    FPC #0
        PFE #1  : Links ok
    FPC #2
        PFE #1  : Links ok
    FPC #3
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #4
    plane state: S_ACTIVE
    FPC #0
        PFE #1  : Links ok
    FPC #2
        PFE #1  : Links ok
    FPC #3
        PFE #0  : Links ok
        PFE #1  : Links ok
```

show chassis fabric sibs (T1600 Router)

```
user@host> show chassis fabric sibs
SIB #0
    plane state: S_SPARE
    FPC #0
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #1
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #2
        PFE #0  : Links ok
    FPC #4
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #5
        PFE #0  : Links ok
    FPC #6
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #7
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #1
    plane state: S_ACTIVE , plane has link errors on 2 pfes
    FPC #0
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #1
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #3
```

```
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #4
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #5
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #7
        PFE #0  : Links ok
        PFE #1  : Links okSIB #2
    plane state: S_ACTIVE
SIB #2
        plane state: S_ACTIVE
FPC #0
        PFE #0  : Links ok
        PFE #1  : Links ok
FPC #1
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #2
        PFE #0  : Links ok
    FPC #4
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #5
        PFE #0  : Links ok
    FPC #6
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #7
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #3
    plane state: S_ACTIVE
    FPC #0
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #1
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #2
        PFE #0  : Links ok
    FPC #4
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #5
        PFE #0  : Links ok
    FPC #6
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #7
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #4
    plane state: S_ACTIVE
    FPC #0
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #1
        PFE #0  : Links ok
```



```
        PFE #1  : Links ok
    FPC #2
        PFE #0  : Links ok
    FPC #4
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #5
        PFE #0  : Links ok
    FPC #6
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #7
        PFE #0  : Links ok
        PFE #1  : Links ok
```

show chassis fabric sibs (T4000 Core Router)

```
user@host> show chassis fabric sibs
Fabric management SIB state:
SIB #0
    plane state: S_SPARE
    FPC #2
        PFE #0  : Links ok
    FPC #3
        PFE #0  : Links ok
    FPC #5
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #6
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #1
    plane state: S_ACTIVE
    FPC #2
        PFE #0  : Links ok
    FPC #3
        PFE #0  : Links ok
    FPC #5
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #6
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #2
    plane state: S_ACTIVE
    FPC #2
        PFE #0  : Links ok
    FPC #3
        PFE #0  : Links ok
    FPC #5
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #6
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #3
    plane state: S_ACTIVE
    FPC #2
        PFE #0  : Links ok
    FPC #3
        PFE #0  : Links ok
```



```
    FPC #5
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #6
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #4
    plane state: S_ACTIVE
    FPC #2
        PFE #0  : Links ok
    FPC #3
        PFE #0  : Links ok
    FPC #5
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #6
        PFE #0  : Links ok
        PFE #1  : Links ok
```

show chassis fabric sibs (TX Matrix Router)

```
user@host> show chassis fabric sibs
scc-re0:
--------------------------------------------------------------------------
Fabric management SIB state:
SIB #1
    plane state: S_ACTIVE , plane has link errors on 2 pfes
    FPC #0
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #1
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #3
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #4
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #5
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #7
        PFE #0  : Links ok
        PFE #1  : Links ok
SIB #2
    plane state: S_ACTIVE
    LCC #0      : Links ok
    LCC #1      : Links ok
SIB #3
    plane state: S_ACTIVE
    LCC #0      : Links ok
    LCC #1      : Links ok
SIB #4
    plane state: S_ACTIVE
    LCC #0      : Links ok
    LCC #1      : Links ok

lcc0-re0:
--------------------------------------------------------------------------
Fabric management SIB state:
```

```
SIB #1
    plane state: S_ACTIVE
    FPC #0
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #1
        PFE #1  : Links ok
    FPC #2
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #3
        PFE #1  : Links ok
    FPC #4
        PFE #1  : Links ok
    FPC #5
        PFE #0  : Links ok
    FPC #6
        PFE #1  : Links ok
    FPC #7
        PFE #1  : Links ok
    SCC         : Links ok
SIB #2
    plane state: S_ACTIVE
    FPC #0
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #1
        PFE #1  : Links ok
    FPC #2
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #3
        PFE #1  : Links ok
    FPC #4
        PFE #1  : Links ok
    FPC #5
        PFE #0  : Links ok
    FPC #6
        PFE #1  : Links ok
    FPC #7
        PFE #1  : Links ok
    SCC         : Links ok
SIB #3
    plane state: S_ACTIVE
    FPC #0
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #1
        PFE #1  : Links ok
    FPC #2
        PFE #0  : Links ok
        PFE #1  : Links ok
    FPC #3
        PFE #1  : Links ok
    FPC #4
        PFE #1  : Links ok
    FPC #5
        PFE #0  : Links ok
    FPC #6
        PFE #1  : Links ok
    FPC #7
```

```
        PFE #1   : Links ok
    SCC          : Links ok
SIB #4
    plane state: S_ACTIVE
    FPC #0
        PFE #0   : Links ok
        PFE #1   : Links ok
    FPC #1
        PFE #1   : Links ok
    FPC #2
        PFE #0   : Links ok
        PFE #1   : Links ok
    FPC #3
        PFE #1   : Links ok
    FPC #4
        PFE #1   : Links ok
    FPC #5
        PFE #0   : Links ok
    FPC #6
        PFE #1   : Links ok
    FPC #7
        PFE #1   : Links ok
    SCC          : Links o
```

show chassis fabric sibs lcc (TX Matrix Router)

```
user@host> show chassis fabric sibs lcc 0
lcc1-re0:
--------------------------------------------------------------------------
Fabric management SIB state:
SIB #1
    plane state: S_ACTIVE
    FPC #0
        PFE #0   : Links ok
    FPC #2
        PFE #1   : Links ok
    FPC #4
        PFE #0   : Links ok
    FPC #5
        PFE #1   : Links ok
    FPC #7
        PFE #0   : Links ok
    SCC          : Links ok
SIB #2
    plane state: S_ACTIVE
    FPC #0
        PFE #0   : Links ok
    FPC #2
        PFE #1   : Links ok
    FPC #4
        PFE #0   : Links ok
    FPC #5
        PFE #1   : Links ok
    FPC #7
        PFE #0   : Links ok
    SCC          : Links ok
SIB #3
    plane state: S_ACTIVE
    FPC #0
        PFE #0   : Links ok
    FPC #2
```



```
        PFE #1  : Links ok
    FPC #4
        PFE #0  : Links ok
    FPC #5
        PFE #1  : Links ok
    FPC #7
        PFE #0  : Links ok
    SCC         : Links ok
SIB #4
    plane state: S_ACTIVE
    FPC #0
        PFE #0  : Links ok
    FPC #2
        PFE #1  : Links ok
    FPC #4
        PFE #0  : Links ok
    FPC #5
        PFE #1  : Links ok
    FPC #7
        PFE #0  : Links ok
    SCC         : Links ok
```

show chassis fabric sibs scc (TX Matrix Router)

```
user@host> show chassis fabric sibs scc
scc-re0:
--------------------------------------------------------------------------
Fabric management SIB state:
SIB #1
    plane state: S_ACTIVE
    LCC #0      : Links ok
    LCC #1      : Links ok
SIB #2
    plane state: S_ACTIVE
    LCC #0      : Links ok
    LCC #1      : Links ok
SIB #3
    plane state: S_ACTIVE
    LCC #0      : Links ok
    LCC #1      : Links ok
SIB #4
    plane state: S_ACTIVE
    LCC #0      : Links ok
    LCC #1      : Links ok
```

show chassis fabric sibs slot (PTX3000 Router)

```
user@host> show chassis fabric sibs slot 0
Fabric management SIB state:
SIB #0  Online
    Fcore #0 (plane 0) Active
        FPC #8
            PFE #0  : OK
            PFE #1  : OK
        FPC #12
            PFE #0  : OK
            PFE #1  : OK
    Fcore #1 (plane 1) Active
        FPC #8
            PFE #0  : OK
            PFE #1  : OK
```

```
FPC #12
    PFE #0  : OK
    PFE #1  : OK
```


show chassis fabric summary

Syntax show chassis fabric summary

Release Information Command introduced in Junos OS Release 8.4.
Command introduced in Junos OS Release 9.4 for EX Series switches.
Command introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description (MX Series routers and EX8200 switches only) Display the state of all fabric planes and the elapsed uptime.

Options This command has no options.

Required Privilege Level view

List of Sample Output
show chassis fabric summary (MX240 Router) on page 1145
show chassis fabric summary (MX480 Router) on page 1145
show chassis fabric summary (MX480 Router with MPC4E) on page 1145
show chassis fabric summary (MX960 Router) on page 1145
show chassis fabric summary (MX2010 Router) on page 1146
show chassis fabric summary (MX2020 Router) on page 1146
show chassis fabric summary (MX2020 Router with MPC4E) on page 1146
show chassis fabric summary (EX8200 Switch) on page 1146
show chassis fabric summary (PTX Series Packet Transport Router) on page 1147

Output Fields Table 79 on page 1143 lists the output fields for the **show chassis fabric summary** command. Output fields are listed in the approximate order in which they appear.

Table 79: show chassis fabric summary Output Fields

Field Name	Field Description
Plane	(MX Series, MX2020 and MX2010 Routers only) Plane number.

Table 79: show chassis fabric summary Output Fields *(continued)*

Field Name	Field Description

State	(MX Series) State of the SIB or FPC:
	
	• **Online**—Switch Interface Board (SIB) is operational and running.
	NOTE: On the Enhanced MX SCB with Trio MPC, a maximum of 4 planes are operational and running. On all the other SCBs with Trio MPC, all the planes are operational and running.
	
	• **Empty**—SIB is powered down.
	• **Check**—SIB is in the **Check** state because of the following reasons:
	  ◦ SIB is not inserted properly.
	  ◦ Some destination errors are detected on the SIB. In this case, the Packet Forwarding Engine stops using the SIB to send traffic to the affected destination Packet Forwarding Engine.
	  ◦ Some link errors are detected on the channel between the SIB and a Packet Forwarding Engine. Link errors can be detected at initialization time or runtime:
	    ▪ Link errors caused by a link training failure at initialization time—The Packet Forwarding Engine does not use the SIB to send traffic. The **show chassis fabric fpcs** command shows **Plane disabled** as status for this link.
	    ▪ Link errors caused by CRC errors detected at runtime—The Packet Forwarding Engine continues to use the SIB to send traffic. The **show chassis fabric fpcs** command shows **Link error** as the status for this link.
	
	NOTE: The **Check** state does not apply to PTX Series Packet Transport Routers because there are no SIBs in the Check state.
	
	For information about link and destination errors, issue the **show chassis fabric fpcs** commands.
	• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fails.
	NOTE: **Spare** does not apply to PTX Series Packet Transport Routers because there are no spare SIBs in the device.
	
	(MX2010 and MX2020 Routers) State of the SFB.
	
	• **Online**—Switch Fabric Board (SFB) is operational and running.
	• **Offline**—Switch Fabric Board (SFB) is powered down.
	• **Check**—Switch Fabric Board (SFB) is in the check state.

Errors	(PTX Series only) Indicates whether there is any error on the SIB. • **None**—No errors • **Link Errors**—Fabric link errors were found on the SIB RX link. • **Cell drops**—Fabric cell drops were found on the SIB ASIC. • **Link, Cell drops**—Both Link errors and cell drops were detected on at least one of the FPC's fabric links. NOTE: The **Errors** column is empty only when the FPC or SIB is offline.

Table 79: show chassis fabric summary Output Fields *(continued)*

Field Name	Field Description
Uptime	(MX Series, MX2010 and MX2020 Routers) Elapsed time the plane has been online.

Sample Output

show chassis fabric summary (MX240 Router)

```
user@host> show chassis fabric summary
Plane   State    Uptime
 0      Online   23 hours, 26 minutes, 54 seconds
 1      Online   23 hours, 26 minutes, 54 seconds
 2      Check    18 hours, 33 minutes, 42 seconds
 3      Online   23 hours, 26 minutes, 54 seconds
 4      Spare    23 hours, 26 minutes, 54 seconds
 5      Spare    23 hours, 26 minutes, 54 seconds
 6      Spare    23 hours, 26 minutes, 54 seconds
 7      Spare    23 hours, 26 minutes, 54 seconds
```

show chassis fabric summary (MX480 Router)

```
user@host> show chassis fabric summary
Plane   State    Uptime
 0      Online   8 hours, 45 minutes, 29 seconds
 1      Online   8 hours, 45 minutes, 28 seconds
 2      Online   8 hours, 45 minutes, 28 seconds
 3      Online   8 hours, 45 minutes, 28 seconds
 4      Spare    8 hours, 45 minutes, 28 seconds
 5      Spare    8 hours, 45 minutes, 28 seconds
 6      Spare    8 hours, 45 minutes, 28 seconds
 7      Check    6 hours, 10 minutes, 12 seconds
```

show chassis fabric summary (MX480 Router with MPC4E)

```
user@host > show chassis fabric summary
Plane   State    Uptime
 0      Online   6 hours, 57 minutes, 44 seconds
 1      Online   6 hours, 57 minutes, 40 seconds
 2      Online   6 hours, 57 minutes, 39 seconds
 3      Online   6 hours, 57 minutes, 34 seconds
 4      Spare    6 hours, 57 minutes, 34 seconds
 5      Spare    6 hours, 57 minutes, 29 seconds
 6      Spare    6 hours, 57 minutes, 29 seconds
 7      Spare    6 hours, 57 minutes, 24 seconds
 Note:
 For FPC slots with MPC Type 4 or MCC:
   Fabric planes 1 and 5, 3 and 7 use shared physical links.
   Those slots may run in a reduced bandwidth in case both
   plane 1 and 5, or both 3 and 7 are active.
```

show chassis fabric summary (MX960 Router)

```
user@host> show chassis fabric summary
Plane   State    Uptime
 0      Online   3 hours, 7 minutes, 9 seconds
 1      Online   3 hours, 7 minutes, 4 seconds
```

```
2       Online   3 hours, 6 minutes, 59 seconds
3       Online   3 hours, 6 minutes, 54 seconds
4       Empty
5       Empty
```

show chassis fabric summary (MX2010 Router)

```
user@host> show chassis fabric summary
Plane   State    Uptime
 0      Online   1 day, 13 hours, 20 minutes, 10 seconds
 1      Online   1 day, 13 hours, 19 minutes, 59 seconds
 2      Online   1 day, 13 hours, 19 minutes, 49 seconds
 3      Offline
 4      Online   1 day, 13 hours, 19 minutes, 28 seconds
 5      Check    1 day, 13 hours, 19 minutes, 17 seconds
 6      Online   1 day, 13 hours, 19 minutes, 6 seconds
 7      Online   1 hour, 43 minutes, 5 seconds
```

show chassis fabric summary (MX2020 Router)

```
user@host> show chassis fabric summary
Plane   State    Uptime
 0      Online   8 hours, 24 minutes, 1 second
 1      Online   8 hours, 47 minutes, 54 seconds
 2      Online   8 hours, 47 minutes, 44 seconds
 3      Online   8 hours, 47 minutes, 33 seconds
 4      Online   8 hours, 47 minutes, 22 seconds
 5      Online   8 hours, 47 minutes, 12 seconds
 6      Online   8 hours, 47 minutes, 1 second
 7      Online   8 hours, 46 minutes, 50 seconds
```

show chassis fabric summary (MX2020 Router with MPC4E)

```
user@host > show chassis fabric summary
Plane   State    Uptime
 0      Online   3 days, 6 hours, 58 minutes, 29 seconds
 1      Online   3 days, 6 hours, 58 minutes, 18 seconds
 2      Online   3 days, 6 hours, 58 minutes, 8 seconds
 3      Online   3 days, 6 hours, 57 minutes, 57 seconds
 4      Online   3 days, 6 hours, 57 minutes, 46 seconds
 5      Online   3 days, 6 hours, 57 minutes, 36 seconds
 6      Online   3 days, 6 hours, 57 minutes, 25 seconds
 7      Online   3 days, 6 hours, 57 minutes, 14 seconds
```

show chassis fabric summary (EX8200 Switch)

```
user@host> show chassis fabric summary
Plane   State    Uptime
 0      Online   12 days, 50 minutes, 54 seconds
 1      Online   12 days, 50 minutes, 53 seconds
 2      Online   12 days, 50 minutes, 53 seconds
 3      Online   12 days, 50 minutes, 52 seconds
 4      Spare    12 days, 50 minutes, 49 seconds
 5      Spare    12 days, 50 minutes, 47 seconds
 6      Spare    12 days, 50 minutes, 47 seconds
 7      Spare    12 days, 50 minutes, 46 seconds
 8      Online   12 days, 50 minutes, 52 seconds
 9      Online   12 days, 50 minutes, 50 seconds
 10     Online   12 days, 50 minutes, 50 seconds
 11     Online   12 days, 50 minutes, 49 seconds
```


show chassis fabric summary (PTX Series Packet Transport Router)

```
user@host> show chassis fabric summary
FRU         State         Errors

SIB0        Online        None
SIB1        Online        Link Errors
SIB2        Online        None
SIB3        Online        Cell drops
SIB4        Offline
SIB5        Online        None
SIB6        Online        Link, Cell drops
SIB7        Online        None
SIB8        Online        Link, Cell drops

FPC0        Online        None
FPC1        Online        Link Errors
FPC2        Online        None
FPC3        Offline
FPC4        Online        None
FPC5        Online        None
FPC6        Empty
FPC7        Empty
```


show chassis fabric topology

List of Syntax

Syntax

```
show chassis fabric topology
<lcc number | scc>
<sib-slot>
```

Syntax (TX Matrix Router)

```
show chassis fabric topology
<lcc number | scc>
<sib-slot>
```

Syntax (TX Matrix Plus Router)

```
show chassis fabric topology
<lcc number | sfc number>
<sib-slot>
```

Syntax (T4000 Core Router)

```
show chassis fabric topology
<sib-slot>
```

Syntax (PTX Series Packet Transport Routers)

```
show chassis fabric topology
```

Release Information

Command introduced before Junos OS Release 7.4.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.

Description

(TX Matrix routers only) Display the state of the switching fabric topology for the Switch Interface Board (SIB) connection between the TX Matrix router and the T640 routers.

(TX Matrix Plus routers only) Display the state of the switching fabric topology for the SIB connection between the TX Matrix Plus router and the connected routers.

(T320, T640, T1600, and T4000 routers only) Display the state of the switching fabric topology for the connection between the Switch Interface Board (SIB) and the FPCs.

(PTX Series Packet Transport Routers only) Display the input-output link topology.

Options

none—(TX Matrix routers only) Display the state of the switching fabric topology for the Switch Interface Board (SIB) connection between the TX Matrix router and the T640 routers.

(TX Matrix Plus routers only) Display the state of the switching fabric topology for the SIB connection between the TX Matrix Plus router and the connected routers.

(T320, T640, T1600, and T4000 routers only) Display the state of the switching fabric topology for the connection between the Switch Interface Board (SIB) and the FPCs.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the fabric topology state for a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display the fabric topology state for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc—(TX Matrix routers only) (Optional) Display the fabric topology state for the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display the fabric topology for the switch-fabric chassis. Replace ***number*** with **0**.

sib-slot—(Optional) Display the fabric topology state for a specified SIB slot. Replace ***sib-slot*** with a value from **0** through **4**. On a TX Matrix Plus router, replace ***sib-slot*** with a value from **0** through **15**.

Required Privilege Level

view

Related Documentation

- *Layer 2 Wholesale Network Topology Overview*

List of Sample Output

show chassis fabric topology scc (TX Matrix Router) on page 1153
show chassis fabric topology lcc on page 1155
show chassis fabric topology (TX Matrix Plus Router) on page 1157
show chassis fabric topology sfc (TX Matrix Plus Router) on page 1158
show chassis fabric topology lcc (TX Matrix Plus Router) on page 1159
show chassis fabric topology (T4000 Core Router) on page 1160
show chassis fabric topology lcc (TX Matrix Plus Router with 3D SIBs) on page 1161
show chassis fabric topology sfc (TX Matrix Plus Router with 3D SIBs) on page 1163
show chassis fabric topology (PTX5000 Router) on page 1167
show chassis fabric topology (PTX3000 Router) on page 1170

Output Fields

Table 80 on page 1150 lists the output fields for the **show chassis fabric topology** command. Output fields are listed in the approximate order in which they appear.

Table 80: 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:
	• **RESET**—Link between the SIB and the FPC/DPC is powered down on purpose. This is done in all non-dual Packet Forwarding Engine–based boards.
	• **UP**—Link between the SIB and the FPC/DCP is up and running.
	• **DOWN**—Link between the SIB and the FPC/DCP is powered down.
	• **FAULT**—The SIB is in the alarmed state, in which the SIB's plane is not operational for one or more of the following reasons:
	  ◦ On-board F-chip is not operational.
	  ◦ Fiber-optic connector faults.
	  ◦ FPC connector faults.
	  ◦ SIB midplane connector faults.
	NOTE: The following state descriptions are applicable only to PTX Series Packet Transport Routers.
	• **OK**—The link between the SIB and the FPC is operational.
	• **Down**—The link between the SIB and the FPC is powered down.
	• **Error**—The CCL link between the SIB and FPC is not operational for one or more of the following reasons:
	  ◦ FPC midplane connector failure.
	  ◦ SIB midplane connector failure.
	  ◦ CCL link CRC error.

Table 80: show chassis fabric topology Output Fields *(continued)*

Out-Links: and **In-Links** (TX Matrix Plus router only)

State of the links from the F13 SIB to the LCC or vice-versa. Out-Links indicate Tx links. In-Links indicate an Rx link. The following additional fields are displayed for each SIB:

- **VCSEL Status**—Optical (VCSEL channel) link status for the corresponding electrical (HSL2) link. The states include:
  - **OK**—Optical signal power is good.
  - **Error**—Internal error.
  - **LOS**—Loss of Signal detected.
  - **High Cur**—The Tx Bias-current is higher than threshold on this channel. This is applicable only to Tx Channels.
  - **Low Cur** —The Tx Bias-current is lower than threshold on this channel. This is applicable only to Tx Channels.
- **HSL2 Channel**—HSL2 is the electrical link used to connect ASICs to the in-link and out-link. The channel number corresponds to the link and varies based on the ASIC or configuration.

- **HSL2 Status** —The status of the HSL2 Channel. Includes the following states:
- **Up**—Channel is up.
- **Down**—Channel is down.
- **Reset**—Channel has been reset.
- **Fault**—Channel has faults.

The following is a representation of display output for links originating from the SIBs (LCC or SFC)

```
SF_[1|3]_port#_FB_[A-D](VCSEL#, fiber)
```

- **SF_[1|3]**—Name of the ASIC, with Fabric F1 or F3 mode.
- **port#**—HSL2 port number on the SF ASIC in the LCC.
- **FB_[A-D]**—via fiber bundle A, B, C or D.
- **VCSEL#**—VCSEL module number on SIB.
- **fiber**—Fiber channel number.

The following is a representation of display output for links originating from the SIBs (LCC or SFC)

```
SF_[1|3]_port#_FB_[A-D](VCSEL#, fiber)
```

- **SF_[1|3]**—Name of the ASIC, with Fabric F1 or F3 mode.
- **port#**—HSL2 port number on the SF ASIC in the LCC.
- **FB_[A-D]**—via fiber bundle A, B, C or D.
- **VCSEL#**—VCSEL module number on SIB.
- **fiber**—Fiber channel number.

The following is a sample output with description of the fields displayed in the output for Out-Links:

```
Out-Links:
=========
SF_30_13_FB_A(21,09) -> FPC7_B_SG(3,3,6)_FB_A(18,09)      OK        203      Up
```

Table 80: show chassis fabric topology Output Fields *(continued)*

- **SF_30_13**—Name of the ASIC, with Fabric F1 or F3 mode. In this case, 3 is the F3 direction and is used in the Tx path and 0 identifies the serial link on the SF chip (in this case, link goes to sf-3 chip number 0). You can also have F1 mode and Rx path instead.
- **FB_A (21, 09)**—Fiber bundle A, with VCSEL unit number 21 within the SIB, and channel number 9 within the unit number.
- **FPC7_B_SG(3,3,6**—FPC 7.with bottom Packet Forwarding Engine (T for top PFE and B for bottom PFE), SG ASIC, with number 3 and port number 3, with HSL2 link number with the SIB as 6.
- **FB_A(18, 09)**—Fiber Bundle, with VCSEL unit number 18 within the SIB, and VCSEL channel number 9 within the unit number.

The following is a representation of display output for links originating from the FPCs (In-Links)

```
FPC#_[T|B]_SG(ASIC#, port#, HSL2_bit)_FB_[A-D](VCSEL#, fiber)
```

- **FPC#**—FPC number with PFE (0 or 1).
- **T**—Top Packet Forwarding Engine.
- **B**—Bottom Packet Forwarding Engine.
- **SG(ASIC#, port#, HSL2_bit)**—SG ASIC information (ASIC 0-3, port 0-3, HSL2_bit 0-7).
- **FB_[A-D]**—via fiber bundle A, B, C or D.
- **VCSEL#**—VCSEL module number on SIB.
- **fiber**—Fiber channel number.

The following is a representation of display output for links originating from the FPCs (In-Links)

```
FPC#_[T|B]_SG(ASIC#, port#, HSL2_bit)_FB_[A-D](VCSEL#, fiber)
```

- **FPC#**—FPC number with PFE (0 or 1).
- **T**—Top Packet Forwarding Engine.
- **B**—Bottom Packet Forwarding Engine.
- **SG(ASIC#, port#, HSL2_bit)**—SG ASIC information (ASIC 0-3, port 0-3, HSL2_bit 0-7).
- **FB_[A-D]**—via fiber bundle A, B, C or D.
- **VCSEL#**—VCSEL module number on SIB.
- **fiber**—Fiber channel number.

The following is a sample output with description of the fields displayed in the output for In-Links:

```
In-Links :
========
FPC0_T_SG(0,0,0)_FB_D(04,11)  -> SF_10_00_FB_D(01,11)     OK        0        Up
```

- **FPC0**—FPC 0.
- **T**—Top Packet Forwarding Engine.
- **SG (0, 0, 0)**—SG ASIC with port number 0 and link 0.
- **FB_D (04,11)**—Fiber Bundle D with VCSEL 4, channel 11.
- **SF_10**—Indicates F1 mode chip number 0 and Rx path.
- **SF_10_00_FB_D(01,11)** —Indicates F1 mode chip number 0 and Rx path with port 0, fiber bundle D, with VCSEL 1, channel 11.

Table 80: show chassis fabric topology Output Fields *(continued)*

Out-links and **In-links** (TX Matrix Plus router with 3D SIBs only)

State of the links from the F13 SIB to the SFC/LCC or vice-versa. Out-Links indicate Tx links. In-Links indicate an Rx link. The following additional fields are displayed for each SIB:

- Description of the fields displayed in the output for **In-links** and **Out-links** for SFC:

```
--------------------------------------------------------------------------
          In-links                  State            Out-links              State
------------------------------------------------------------------------------
CXP0_Evn->F13_SIB0_XF2,04_0        Up       F13_SIB0_XF2,04_0->CXP0_Evn       Up
```

  - **CXP0_Evn**—CXP optics with type of port bits such as even or odd. In this case, it indicates CXP optics with even port bit number 0.
  - **F13_SIB0**—Name of the SFC data plane SIB with the SIB number. In this case, it indicates F13 SIB with number 0.
  - **XF2,04_0**—Name of the ASIC with port and subchannel number. In this case, it Indicates XF2 chip with port number 4 and subchannel number 0.

- Description of the fields displayed in the output for **In-links** and **Out-links** for LCC:

```
--------------------------------------------------------------------------
            In-links                  State             Out-links
State
------------------------------------------------------------------------------
CXP0_Evn->LCC_SIB0_XF3,10_0        Up       LCC_SIB0_XF3,10_0->CXP0_Evn       Up
```

  - **CXP0_Evn**—CXP optics with the type of port bits such as even or odd. In this case, it indicates CXP optics with even port bit number 0.
  - **LCC_SIB0**—LCC SIB number. In this case, it indicates LCC SIB with number 0.
  - **XF3,10_0**—Name of the ASIC with port and subchannel number. In this case, it Indicates XF3 with port number 10 and subchannel number 0.

Sample Output

show chassis fabric topology scc (TX Matrix Router)

```
user@host> show chassis fabric topology scc
scc-re1:
--------------------------------------------------------------------------------
fchip (mode)
in-links        state   out-links         state
--------------------------------------------------------------------------------

Sib #0 :
---------
SIB0_F0 (F2 ):
LCC0_SIB-L0_F0,03->SIB-S0_F0,00  UP        SIB-S0_F0,00->LCC0_SIB-L0_F1,00  UP
LCC1_SIB-L0_F0,03->SIB-S0_F0,01  UP        SIB-S0_F0,01->LCC1_SIB-L0_F1,08  UP
LCC2_SIB-L0_F0,03->SIB-S0_F0,02  RESET      SIB-S0_F0,02->LCC2_SIB-L0_F1,08  UP
LCC3_SIB-L0_F0,03->SIB-S0_F0,03  RESET      SIB-S0_F0,03->LCC3_SIB-L0_F1,00  UP
LCC0_SIB-L0_F0,02->SIB-S0_F0,04  UP        SIB-S0_F0,04->LCC0_SIB-L0_F1,01  UP
LCC1_SIB-L0_F0,02->SIB-S0_F0,05  UP        SIB-S0_F0,05->LCC1_SIB-L0_F1,09  UP
LCC2_SIB-L0_F0,02->SIB-S0_F0,06  RESET      SIB-S0_F0,06->LCC2_SIB-L0_F1,09  UP
LCC3_SIB-L0_F0,02->SIB-S0_F0,07  RESET      SIB-S0_F0,07->LCC3_SIB-L0_F1,01  UP
```

```
LCC0_SIB-L0_F0,07->SIB-S0_F0,08  UP         SIB-S0_F0,08->LCC0_SIB-L0_F1,04  UP
LCC1_SIB-L0_F0,07->SIB-S0_F0,09  UP         SIB-S0_F0,09->LCC1_SIB-L0_F1,12  UP
LCC2_SIB-L0_F0,07->SIB-S0_F0,10  RESET       SIB-S0_F0,10->LCC2_SIB-L0_F1,12  UP
LCC3_SIB-L0_F0,07->SIB-S0_F0,11  RESET       SIB-S0_F0,11->LCC3_SIB-L0_F1,04  UP
LCC0_SIB-L0_F0,06->SIB-S0_F0,12  UP         SIB-S0_F0,12->LCC0_SIB-L0_F1,05  UP
LCC1_SIB-L0_F0,06->SIB-S0_F0,13  UP         SIB-S0_F0,13->LCC1_SIB-L0_F1,13  UP
LCC2_SIB-L0_F0,06->SIB-S0_F0,14  RESET       SIB-S0_F0,14->LCC2_SIB-L0_F1,13  UP
LCC3_SIB-L0_F0,06->SIB-S0_F0,15  RESET       SIB-S0_F0,15->LCC3_SIB-L0_F1,05  UP
SIB0_F1 (F2 ):
LCC0_SIB-L0_F0,11->SIB-S0_F1,00  UP         SIB-S0_F1,00->LCC0_SIB-L0_F1,08  UP
LCC1_SIB-L0_F0,11->SIB-S0_F1,01  UP         SIB-S0_F1,01->LCC1_SIB-L0_F1,00  UP
LCC2_SIB-L0_F0,11->SIB-S0_F1,02  RESET       SIB-S0_F1,02->LCC2_SIB-L0_F1,00  UP
LCC3_SIB-L0_F0,11->SIB-S0_F1,03  RESET       SIB-S0_F1,03->LCC3_SIB-L0_F1,08  UP
LCC0_SIB-L0_F0,10->SIB-S0_F1,04  UP         SIB-S0_F1,04->LCC0_SIB-L0_F1,09  UP
LCC1_SIB-L0_F0,10->SIB-S0_F1,05  UP         SIB-S0_F1,05->LCC1_SIB-L0_F1,01  UP
LCC2_SIB-L0_F0,10->SIB-S0_F1,06  RESET       SIB-S0_F1,06->LCC2_SIB-L0_F1,01  UP
LCC3_SIB-L0_F0,10->SIB-S0_F1,07  RESET       SIB-S0_F1,07->LCC3_SIB-L0_F1,09  UP
LCC0_SIB-L0_F0,15->SIB-S0_F1,08  UP         SIB-S0_F1,08->LCC0_SIB-L0_F1,12  UP
LCC1_SIB-L0_F0,15->SIB-S0_F1,09  UP         SIB-S0_F1,09->LCC1_SIB-L0_F1,04  UP
LCC2_SIB-L0_F0,15->SIB-S0_F1,10  RESET       SIB-S0_F1,10->LCC2_SIB-L0_F1,04  UP
LCC3_SIB-L0_F0,15->SIB-S0_F1,11  RESET       SIB-S0_F1,11->LCC3_SIB-L0_F1,12  UP
LCC0_SIB-L0_F0,14->SIB-S0_F1,12  UP         SIB-S0_F1,12->LCC0_SIB-L0_F1,13  UP
LCC1_SIB-L0_F0,14->SIB-S0_F1,13  UP         SIB-S0_F1,13->LCC1_SIB-L0_F1,05  UP
LCC2_SIB-L0_F0,14->SIB-S0_F1,14  RESET        SIB-S0_F1,14->LCC2_SIB-L0_F1,05
UP
LCC3_SIB-L0_F0,14->SIB-S0_F1,15  RESET        SIB-S0_F1,15->LCC3_SIB-L0_F1,13
UP
SIB0_F2 (F2 ):
LCC3_SIB-L0_F0,13->SIB-S0_F2,00   RESET      SIB-S0_F2,00->LCC3_SIB-L0_F1,14  UP
LCC2_SIB-L0_F0,13->SIB-S0_F2,01  RESET        SIB-S0_F2,01->LCC2_SIB-L0_F1,06
UP
LCC1_SIB-L0_F0,13->SIB-S0_F2,02  UP         SIB-S0_F2,02->LCC1_SIB-L0_F1,06  UP
LCC0_SIB-L0_F0,13->SIB-S0_F2,03  UP         SIB-S0_F2,03->LCC0_SIB-L0_F1,14  UP
LCC3_SIB-L0_F0,12->SIB-S0_F2,04  RESET        SIB-S0_F2,04->LCC3_SIB-L0_F1,15
UP
LCC2_SIB-L0_F0,12->SIB-S0_F2,05  RESET       SIB-S0_F2,05->LCC2_SIB-L0_F1,07  UP
LCC1_SIB-L0_F0,12->SIB-S0_F2,06  UP         SIB-S0_F2,06->LCC1_SIB-L0_F1,07  UP
LCC0_SIB-L0_F0,12->SIB-S0_F2,07  UP         SIB-S0_F2,07->LCC0_SIB-L0_F1,15  UP
LCC3_SIB-L0_F0,09->SIB-S0_F2,08  RESET        SIB-S0_F2,08->LCC3_SIB-L0_F1,10
UP
LCC2_SIB-L0_F0,09->SIB-S0_F2,09  RESET        SIB-S0_F2,09->LCC2_SIB-L0_F1,02
UP
LCC1_SIB-L0_F0,09->SIB-S0_F2,10  UP         SIB-S0_F2,10->LCC1_SIB-L0_F1,02  UP
LCC0_SIB-L0_F0,09->SIB-S0_F2,11  UP         SIB-S0_F2,11->LCC0_SIB-L0_F1,10  UP
LCC3_SIB-L0_F0,08->SIB-S0_F2,12  RESET        SIB-S0_F2,12->LCC3_SIB-L0_F1,11
UP
LCC2_SIB-L0_F0,08->SIB-S0_F2,13  RESET        SIB-S0_F2,13->LCC2_SIB-L0_F1,03
UP
LCC1_SIB-L0_F0,08->SIB-S0_F2,14  UP         SIB-S0_F2,14->LCC1_SIB-L0_F1,03  UP
LCC0_SIB-L0_F0,08->SIB-S0_F2,15  UP         SIB-S0_F2,15->LCC0_SIB-L0_F1,11  UP
SIB0_F3 (F2 ):
LCC3_SIB-L0_F0,05->SIB-S0_F3,00  RESET        SIB-S0_F3,00->LCC3_SIB-L0_F1,06
UP
LCC2_SIB-L0_F0,05->SIB-S0_F3,01  RESET        SIB-S0_F3,01->LCC2_SIB-L0_F1,14
UP
LCC1_SIB-L0_F0,05->SIB-S0_F3,02  UP         SIB-S0_F3,02->LCC1_SIB-L0_F1,14  UP
LCC0_SIB-L0_F0,05->SIB-S0_F3,03  UP         SIB-S0_F3,03->LCC0_SIB-L0_F1,06  UP
LCC3_SIB-L0_F0,04->SIB-S0_F3,04  RESET        SIB-S0_F3,04->LCC3_SIB-L0_F1,07
UP
LCC2_SIB-L0_F0,04->SIB-S0_F3,05  RESET        SIB-S0_F3,05->LCC2_SIB-L0_F1,15
UP
```

```
LCC1_SIB-L0_F0,04->SIB-S0_F3,06  UP        SIB-S0_F3,06->LCC1_SIB-L0_F1,15  UP
LCC0_SIB-L0_F0,04->SIB-S0_F3,07  UP        SIB-S0_F3,07->LCC0_SIB-L0_F1,07  UP
LCC3_SIB-L0_F0,01->SIB-S0_F3,08  RESET       SIB-S0_F3,08->LCC3_SIB-L0_F1,02
UP
LCC2_SIB-L0_F0,01->SIB-S0_F3,09  RESET       SIB-S0_F3,09->LCC2_SIB-L0_F1,10
UP
LCC1_SIB-L0_F0,01->SIB-S0_F3,10  UP        SIB-S0_F3,10->LCC1_SIB-L0_F1,10  UP
LCC0_SIB-L0_F0,01->SIB-S0_F3,11  UP        SIB-S0_F3,11->LCC0_SIB-L0_F1,02  UP
LCC3_SIB-L0_F0,00->SIB-S0_F3,12  RESET       SIB-S0_F3,12->LCC3_SIB-L0_F1,03
UP
LCC2_SIB-L0_F0,00->SIB-S0_F3,13  RESET       SIB-S0_F3,13->LCC2_SIB-L0_F1,11
UP
LCC1_SIB-L0_F0,00->SIB-S0_F3,14  UP        SIB-S0_F3,14->LCC1_SIB-L0_F1,11  UP
LCC0_SIB-L0_F0,00->SIB-S0_F3,15  UP        SIB-S0_F3,15->LCC0_SIB-L0_F1,03  UP
Sib #1 :
---------
SIB1_F0 (F2 ):
LCC0_SIB-L1_F0,03->SIB-S1_F0,00 RESET       SIB-S1_F0,00->LCC0_SIB-L1_F1,00  UP
LCC1_SIB-L1_F0,03->SIB-S1_F0,01 RESET       SIB-S1_F0,01->LCC1_SIB-L1_F1,08  UP
LCC2_SIB-L1_F0,03->SIB-S1_F0,02 RESET       SIB-S1_F0,02->LCC2_SIB-L1_F1,08  UP
LCC3_SIB-L1_F0,03->SIB-S1_F0,03 RESET       SIB-S1_F0,03->LCC3_SIB-L1_F1,00  UP
LCC0_SIB-L1_F0,02->SIB-S1_F0,04 RESET       SIB-S1_F0,04->LCC0_SIB-L1_F1,01  UP
LCC1_SIB-L1_F0,02->SIB-S1_F0,05 RESET       SIB-S1_F0,05->LCC1_SIB-L1_F1,09  UP
LCC2_SIB-L1_F0,02->SIB-S1_F0,06 RESET       SIB-S1_F0,06->LCC2_SIB-L1_F1,09  UP
LCC3_SIB-L1_F0,02->SIB-S1_F0,07 RESET       SIB-S1_F0,07->LCC3_SIB-L1_F1,01  UP
LCC0_SIB-L1_F0,07->SIB-S1_F0,08 RESET       SIB-S1_F0,08->LCC0_SIB-L1_F1,04  UP
LCC1_SIB-L1_F0,07->SIB-S1_F0,09 RESET       SIB-S1_F0,09->LCC1_SIB-L1_F1,12  UP
LCC2_SIB-L1_F0,07->SIB-S1_F0,10 RESET       SIB-S1_F0,10->LCC2_SIB-L1_F1,12  UP
LCC3_SIB-L1_F0,07->SIB-S1_F0,11 RESET       SIB-S1_F0,11->LCC3_SIB-L1_F1,04  UP
LCC0_SIB-L1_F0,06->SIB-S1_F0,12 RESET       SIB-S1_F0,12->LCC0_SIB-L1_F1,05  UP
LCC1_SIB-L1_F0,06->SIB-S1_F0,13 RESET       SIB-S1_F0,13->LCC1_SIB-L1_F1,13  UP
LCC2_SIB-L1_F0,06->SIB-S1_F0,14 RESET       SIB-S1_F0,14->LCC2_SIB-L1_F1,13  UP
LCC3_SIB-L1_F0,06->SIB-S1_F0,15 RESET       SIB-S1_F0,15->LCC3_SIB-L1_F1,05  UP
SIB1_F1 (F2 ):
LCC0_SIB-L1_F0,11->SIB-S1_F1,00 RESET       SIB-S1_F1,00->LCC0_SIB-L1_F1,08  UP
LCC1_SIB-L1_F0,11->SIB-S1_F1,01 RESET       SIB-S1_F1,01->LCC1_SIB-L1_F1,00  UP
LCC2_SIB-L1_F0,11->SIB-S1_F1,02 RESET       SIB-S1_F1,02->LCC2_SIB-L1_F1,00  UP
LCC3_SIB-L1_F0,11->SIB-S1_F1,03 RESET       SIB-S1_F1,03->LCC3_SIB-L1_F1,08  UP
LCC0_SIB-L1_F0,10->SIB-S1_F1,04 RESET       SIB-S1_F1,04->LCC0_SIB-L1_F1,09  UP
LCC1_SIB-L1_F0,10->SIB-S1_F1,05 RESET       SIB-S1_F1,05->LCC1_SIB-L1_F1,01  UP
LCC2_SIB-L1_F0,10->SIB-S1_F1,06 RESET       SIB-S1_F1,06->LCC2_SIB-L1_F1,01  UP
LCC3_SIB-L1_F0,10->SIB-S1_F1,07 RESET       SIB-S1_F1,07->LCC3_SIB-L1_F1,09  UP
LCC0_SIB-L1_F0,15->SIB-S1_F1,08 RESET       SIB-S1_F1,08->LCC0_SIB-L1_F1,12  UP
LCC1_SIB-L1_F0,15->SIB-S1_F1,09 RESET       SIB-S1_F1,09->LCC1_SIB-L1_F1,04  UP
LCC2_SIB-L1_F0,15->SIB-S1_F1,10 RESET       SIB-S1_F1,10->LCC2_SIB-L1_F1,04  UP
LCC3_SIB-L1_F0,15->SIB-S1_F1,11 RESET       -S1_F1,11->LCC3_SIB-L1_F1,12,05  UP
LCC0_SIB-L1_F0,14->SIB-S1_F1,12 RESET       SIB-S1_F1,12->LCC0_SIB-L1_F1,13  UP
LCC1_SIB-L1_F0,14->SIB-S1_F1,13 RESET       SIB-S1_F1,13->LCC1_SIB-L1_F1,05  UP
LCC2_SIB-L1_F0,14->SIB-S1_F1,14 RESET       SIB-S1_F1,14->LCC2_SIB-L1_F1,05  UP
```

show chassis fabric topology lcc

```
user@host> show chassis fabric topology lcc 0
lcc0-re0:
--------------------------------------------------------------------------
   fchip (mode)
in-links                state         out-links                state
-------------------------------------------------------------------
Sib #2 :
---------
SIB2_F0  (F1 ):
```

```
FPC0_T->SIB-L2_F0,00    DOWN       SIB-L2_F0,00->SIB-S2_F3,15 DOWN
FPC0_B->SIB-L2_F0,01    UP         SIB-L2_F0,01->SIB-S2_F3,11 DOWN
FPC1_T->SIB-L2_F0,02    DOWN       SIB-L2_F0,02->SIB-S2_F0,04 DOWN
FPC1_B->SIB-L2_F0,03    DOWN       SIB-L2_F0,03->SIB-S2_F0,00 DOWN
FPC2_T->SIB-L2_F0,04    DOWN       SIB-L2_F0,04->SIB-S2_F3,07 DOWN
FPC2_B->SIB-L2_F0,05    DOWN       SIB-L2_F0,05->SIB-S2_F3,03 DOWN
FPC3_T->SIB-L2_F0,06    DOWN       SIB-L2_F0,06->SIB-S2_F0,12 DOWN
FPC3_B->SIB-L2_F0,07    DOWN       SIB-L2_F0,07->SIB-S2_F0,08 DOWN
FPC4_T->SIB-L2_F0,08    DOWN       SIB-L2_F0,08->SIB-S2_F2,15 DOWN
FPC4_B->SIB-L2_F0,09    DOWN       SIB-L2_F0,09->SIB-S2_F2,11 DOWN
FPC5_T->SIB-L2_F0,10    DOWN       SIB-L2_F0,10->SIB-S2_F1,04 DOWN
FPC5_B->SIB-L2_F0,11    DOWN       SIB-L2_F0,11->SIB-S2_F1,00 DOWN
FPC6_T->SIB-L2_F0,12    DOWN       SIB-L2_F0,12->SIB-S2_F2,07 DOWN
FPC6_B->SIB-L2_F0,13    UP         SIB-L2_F0,13->SIB-S2_F2,03 DOWN
FPC7_T->SIB-L2_F0,14    DOWN       SIB-L2_F0,14->SIB-S2_F1,12 DOWN
FPC7_B->SIB-L2_F0,15    DOWN       SIB-L2_F0,15->SIB-S2_F1,08 DOWN
SIB2_F1  (F3 ):
SIB-S2_F0,00->SIB-L2_F1,00 UP      SIB-L2_F1,00->FPC7_B    DOWN
SIB-S2_F0,04->SIB-L2_F1,01 UP      SIB-L2_F1,01->FPC7_T    DOWN
SIB-S2_F3,11->SIB-L2_F1,02 UP      SIB-L2_F1,02->FPC6_B    DOWN
SIB-S2_F3,15->SIB-L2_F1,03 UP      SIB-L2_F1,03->FPC6_T    DOWN
SIB-S2_F0,08->SIB-L2_F1,04 UP      SIB-L2_F1,04->FPC5_B    DOWN
SIB-S2_F0,12->SIB-L2_F1,05 UP      SIB-L2_F1,05->FPC5_T    DOWN
SIB-S2_F3,03->SIB-L2_F1,06 UP      SIB-L2_F1,06->FPC4_B    DOWN
SIB-S2_F3,07->SIB-L2_F1,07 UP      SIB-L2_F1,07->FPC4_T    DOWN
SIB-S2_F1,00->SIB-L2_F1,08 UP      SIB-L2_F1,08->FPC3_B    DOWN
SIB-S2_F1,04->SIB-L2_F1,09 UP      SIB-L2_F1,09->FPC3_T    DOWN
SIB-S2_F2,11->SIB-L2_F1,10 UP      SIB-L2_F1,10->FPC2_B    DOWN
SIB-S2_F2,15->SIB-L2_F1,11 UP      SIB-L2_F1,11->FPC2_T    DOWN
SIB-S2_F1,08->SIB-L2_F1,12 UP      SIB-L2_F1,12->FPC1_B    DOWN
SIB-S2_F1,12->SIB-L2_F1,13 UP      SIB-L2_F1,13->FPC1_T    DOWN
SIB-S2_F2,03->SIB-L2_F1,14 UP      SIB-L2_F1,14->FPC0_B    DOWN
SIB-S2_F2,07->SIB-L2_F1,15 UP      SIB-L2_F1,15->FPC0_T    DOWN
Sib #4 :
---------
SIB4_F0  (F1 ):
FPC0_T->SIB-L4_F0,00    RESET      SIB-L4_F0,00->SIB-S4_F3,15 UP
FPC0_B->SIB-L4_F0,01    UP         SIB-L4_F0,01->SIB-S4_F3,11 UP
FPC1_T->SIB-L4_F0,02    RESET      SIB-L4_F0,02->SIB-S4_F0,04 UP
FPC1_B->SIB-L4_F0,03    RESET      SIB-L4_F0,03->SIB-S4_F0,00 UP
FPC2_T->SIB-L4_F0,04    RESET      SIB-L4_F0,04->SIB-S4_F3,07 UP
FPC2_B->SIB-L4_F0,05    RESET      SIB-L4_F0,05->SIB-S4_F3,03 UP
FPC3_T->SIB-L4_F0,06    RESET      SIB-L4_F0,06->SIB-S4_F0,12 UP
FPC3_B->SIB-L4_F0,07    RESET      SIB-L4_F0,07->SIB-S4_F0,08 UP
FPC4_T->SIB-L4_F0,08    RESET      SIB-L4_F0,08->SIB-S4_F2,15 UP
FPC4_B->SIB-L4_F0,09    RESET      SIB-L4_F0,09->SIB-S4_F2,11 UP
FPC5_T->SIB-L4_F0,10    RESET      SIB-L4_F0,10->SIB-S4_F1,04 UP
FPC5_B->SIB-L4_F0,11    RESET      SIB-L4_F0,11->SIB-S4_F1,00 UP
FPC6_T->SIB-L4_F0,12    RESET      SIB-L4_F0,12->SIB-S4_F2,07 UP
FPC6_B->SIB-L4_F0,13    UP         SIB-L4_F0,13->SIB-S4_F2,03 UP
FPC7_T->SIB-L4_F0,14    RESET      SIB-L4_F0,14->SIB-S4_F1,12 UP
FPC7_B->SIB-L4_F0,15    RESET      SIB-L4_F0,15->SIB-S4_F1,08 UP
SIB4_F1  (F3 ):
SIB-S4_F0,00->SIB-L4_F1,00 UP      SIB-L4_F1,00->FPC7_B    UP
SIB-S4_F0,04->SIB-L4_F1,01 UP      SIB-L4_F1,01->FPC7_T    UP
SIB-S4_F3,11->SIB-L4_F1,02 UP      SIB-L4_F1,02->FPC6_B    UP
SIB-S4_F3,15->SIB-L4_F1,03 UP      SIB-L4_F1,03->FPC6_T    UP
SIB-S4_F0,08->SIB-L4_F1,04 UP      SIB-L4_F1,04->FPC5_B    UP
SIB-S4_F0,12->SIB-L4_F1,05 UP      SIB-L4_F1,05->FPC5_T    UP
SIB-S4_F3,03->SIB-L4_F1,06 UP      SIB-L4_F1,06->FPC4_B    UP
SIB-S4_F3,07->SIB-L4_F1,07 UP      SIB-L4_F1,07->FPC4_T    UP
```

```
SIB-S4_F1,00->SIB-L4_F1,08 UP      SIB-L4_F1,08->FPC3_B    UP
SIB-S4_F1,04->SIB-L4_F1,09 UP      SIB-L4_F1,09->FPC3_T    UP
SIB-S4_F2,11->SIB-L4_F1,10 UP      SIB-L4_F1,10->FPC2_B    UP
SIB-S4_F2,15->SIB-L4_F1,11 UP      SIB-L4_F1,11->FPC2_T    UP
SIB-S4_F1,08->SIB-L4_F1,12 UP      SIB-L4_F1,12->FPC1_B    UP
SIB-S4_F1,12->SIB-L4_F1,13 UP      SIB-L4_F1,13->FPC1_T    UP
SIB-S4_F2,03->SIB-L4_F1,14 UP      SIB-L4_F1,14->FPC0_B    UP
SIB-S4_F2,07->SIB-L4_F1,15 UP      SIB-L4_F1,15->FPC0_T    UP
```

show chassis fabric topology (TX Matrix Plus Router)

```
user@host> show chassis fabric topology
sfc0-re0:
--------------------------------------------------------------------------

F13_SIB0
=========

Out-Links:
=========
SFC0_F13_SIB_00       -> LCC00_ST_SIB_L00                 VCSEL    HSL2    HSL2
                                                          Status   Channel Status
================================================================================
SF_30_00_FB_D(04,11) -> FPC0_T_SG(0,0,0)_FB_D(01,11)      OK       112     Up
SF_30_00_FB_D(04,10) -> FPC0_T_SG(0,0,1)_FB_D(01,10)      OK       112     Up
SF_30_00_FB_D(04,09) -> FPC0_T_SG(0,0,2)_FB_D(01,09)      OK       112     Up
SF_30_00_FB_D(04,08) -> FPC0_T_SG(0,0,3)_FB_D(01,08)      OK       112     Up
SF_30_00_FB_D(04,07) -> FPC0_T_SG(0,0,4)_FB_D(01,07)      OK       112     Up
SF_30_00_FB_D(04,06) -> FPC0_T_SG(0,0,5)_FB_D(01,06)      OK       112     Up
SF_30_00_FB_D(04,05) -> FPC0_T_SG(0,0,6)_FB_D(01,05)      OK       112     Up
SF_30_00_FB_D(04,04) -> FPC0_T_SG(0,0,7)_FB_D(01,04)      OK       112     Up
SF_30_01_FB_B(16,11) -> FPC4_T_SG(2,0,0)_FB_B(13,11)      OK       119     Up
SF_30_01_FB_B(16,10) -> FPC4_T_SG(2,0,1)_FB_B(13,10)      OK       119     Up
SF_30_01_FB_B(16,09) -> FPC4_T_SG(2,0,2)_FB_B(13,09)      OK       119     Up
SF_30_01_FB_B(16,08) -> FPC4_T_SG(2,0,3)_FB_B(13,08)      OK       119     Up
SF_30_01_FB_B(16,07) -> FPC4_T_SG(2,0,4)_FB_B(13,07)      OK       119     Up
SF_30_01_FB_B(16,06) -> FPC4_T_SG(2,0,5)_FB_B(13,06)      OK       119     Up
SF_30_01_FB_B(16,05) -> FPC4_T_SG(2,0,6)_FB_B(13,05)      OK       119     Up
SF_30_01_FB_B(16,04) -> FPC4_T_SG(2,0,7)_FB_B(13,04)      OK       119     Up
SF_30_02_FB_D(05,08) -> FPC1_T_SG(0,2,0)_FB_D(02,08)      OK       126     Up
SF_30_02_FB_D(05,07) -> FPC1_T_SG(0,2,1)_FB_D(02,07)      OK       126     Up
SF_30_02_FB_D(05,06) -> FPC1_T_SG(0,2,2)_FB_D(02,06)      OK       126     Up
SF_30_02_FB_D(05,05) -> FPC1_T_SG(0,2,3)_FB_D(02,05)      OK       126     Up
SF_30_02_FB_D(05,03) -> FPC1_T_SG(0,2,4)_FB_D(02,03)      OK       126     Up
SF_30_02_FB_D(05,02) -> FPC1_T_SG(0,2,5)_FB_D(02,02)      OK       126     Up
SF_30_02_FB_D(05,01) -> FPC1_T_SG(0,2,6)_FB_D(02,01)      OK       126     Up
SF_30_02_FB_D(05,00) -> FPC1_T_SG(0,2,7)_FB_D(02,00)      OK       126     Up
SF_30_03_FB_B(17,08) -> FPC5_T_SG(2,2,0)_FB_B(14,08)      OK       133     Up
SF_30_03_FB_B(17,07) -> FPC5_T_SG(2,2,1)_FB_B(14,07)      OK       133     Up
SF_30_03_FB_B(17,06) -> FPC5_T_SG(2,2,2)_FB_B(14,06)      OK       133     Up
SF_30_03_FB_B(17,05) -> FPC5_T_SG(2,2,3)_FB_B(14,05)      OK       133     Up
SF_30_03_FB_B(17,03) -> FPC5_T_SG(2,2,4)_FB_B(14,03)      OK       133     Up
SF_30_03_FB_B(17,02) -> FPC5_T_SG(2,2,5)_FB_B(14,02)      OK       133     Up
SF_30_03_FB_B(17,01) -> FPC5_T_SG(2,2,6)_FB_B(14,01)      OK       133     Up
SF_30_03_FB_B(17,00) -> FPC5_T_SG(2,2,7)_FB_B(14,00)      OK       133     Up
SF_30_04_FB_C(10,11) -> FPC2_T_SG(1,0,0)_FB_C(07,11)      OK       140     Up
SF_30_04_FB_C(10,10) -> FPC2_T_SG(1,0,1)_FB_C(07,10)      OK       140     Up
SF_30_04_FB_C(10,09) -> FPC2_T_SG(1,0,2)_FB_C(07,09)      OK       140     Up
SF_30_04_FB_C(10,08) -> FPC2_T_SG(1,0,3)_FB_C(07,08)      OK       140     Up
SF_30_04_FB_C(10,07) -> FPC2_T_SG(1,0,4)_FB_C(07,07)      OK       140     Up
SF_30_04_FB_C(10,06) -> FPC2_T_SG(1,0,5)_FB_C(07,06)      OK       140     Up
```

```
SF_30_04_FB_C(10,05) -> FPC2_T_SG(1,0,6)_FB_C(07,05)    OK       140      Up
SF_30_04_FB_C(10,04) -> FPC2_T_SG(1,0,7)_FB_C(07,04)    OK       140      Up
SF_30_05_FB_A(22,11) -> FPC6_T_SG(3,0,0)_FB_A(19,11)    OK       147      Up
SF_30_05_FB_A(22,10) -> FPC6_T_SG(3,0,1)_FB_A(19,10)    OK       147      Up
SF_30_05_FB_A(22,09) -> FPC6_T_SG(3,0,2)_FB_A(19,09)    OK       147      Up
SF_30_05_FB_A(22,08) -> FPC6_T_SG(3,0,3)_FB_A(19,08)    OK       147      Up
SF_30_05_FB_A(22,07) -> FPC6_T_SG(3,0,4)_FB_A(19,07)    OK       147      Up
SF_30_05_FB_A(22,06) -> FPC6_T_SG(3,0,5)_FB_A(19,06)    OK       147      Up
SF_30_05_FB_A(22,05) -> FPC6_T_SG(3,0,6)_FB_A(19,05)    OK       147      Up
SF_30_05_FB_A(22,04) -> FPC6_T_SG(3,0,7)_FB_A(19,04)    OK       147      Up
SF_30_06_FB_C(11,08) -> FPC3_T_SG(1,2,0)_FB_C(08,08)    OK       154      Up
SF_30_06_FB_C(11,07) -> FPC3_T_SG(1,2,1)_FB_C(08,07)    OK       154      Up
SF_30_06_FB_C(11,06) -> FPC3_T_SG(1,2,2)_FB_C(08,06)    OK       154      Up
SF_30_06_FB_C(11,05) -> FPC3_T_SG(1,2,3)_FB_C(08,05)    OK       154      Up
SF_30_06_FB_C(11,03) -> FPC3_T_SG(1,2,4)_FB_C(08,03)    OK       154      Up
SF_30_06_FB_C(11,02) -> FPC3_T_SG(1,2,5)_FB_C(08,02)    OK       154      Up
SF_30_06_FB_C(11,01) -> FPC3_T_SG(1,2,6)_FB_C(08,01)    OK       154      Up
SF_30_06_FB_C(11,00) -> FPC3_T_SG(1,2,7)_FB_C(08,00)    OK       154      Up
...
```

show chassis fabric topology sfc (TX Matrix Plus Router)

```
user@host> show chassis fabric topology sfc 0
sfc0-re0:
--------------------------------------------------------------------------

F13_SIB0
=========

Out-Links:
=========
SFC0_F13_SIB_00      -> LCC00_ST_SIB_L00                VCSEL    HSL2     HSL2
                                                        Status   Channel  Status

===============================================================================
SF_30_00_FB_D(04,11) -> FPC0_T_SG(0,0,0)_FB_D(01,11)    OK       112      Up
SF_30_00_FB_D(04,10) -> FPC0_T_SG(0,0,1)_FB_D(01,10)    OK       112      Up
SF_30_00_FB_D(04,09) -> FPC0_T_SG(0,0,2)_FB_D(01,09)    OK       112      Up
SF_30_00_FB_D(04,08) -> FPC0_T_SG(0,0,3)_FB_D(01,08)    OK       112      Up
SF_30_00_FB_D(04,07) -> FPC0_T_SG(0,0,4)_FB_D(01,07)    OK       112      Up
SF_30_00_FB_D(04,06) -> FPC0_T_SG(0,0,5)_FB_D(01,06)    OK       112      Up
SF_30_00_FB_D(04,05) -> FPC0_T_SG(0,0,6)_FB_D(01,05)    OK       112      Up
SF_30_00_FB_D(04,04) -> FPC0_T_SG(0,0,7)_FB_D(01,04)    OK       112      Up
SF_30_01_FB_B(16,11) -> FPC4_T_SG(2,0,0)_FB_B(13,11)    OK       119      Up
SF_30_01_FB_B(16,10) -> FPC4_T_SG(2,0,1)_FB_B(13,10)    OK       119      Up
SF_30_01_FB_B(16,09) -> FPC4_T_SG(2,0,2)_FB_B(13,09)    OK       119      Up
SF_30_01_FB_B(16,08) -> FPC4_T_SG(2,0,3)_FB_B(13,08)    OK       119      Up
SF_30_01_FB_B(16,07) -> FPC4_T_SG(2,0,4)_FB_B(13,07)    OK       119      Up
SF_30_01_FB_B(16,06) -> FPC4_T_SG(2,0,5)_FB_B(13,06)    OK       119      Up
SF_30_01_FB_B(16,05) -> FPC4_T_SG(2,0,6)_FB_B(13,05)    OK       119      Up
SF_30_01_FB_B(16,04) -> FPC4_T_SG(2,0,7)_FB_B(13,04)    OK       119      Up
SF_30_02_FB_D(05,08) -> FPC1_T_SG(0,2,0)_FB_D(02,08)    OK       126      Up
SF_30_02_FB_D(05,07) -> FPC1_T_SG(0,2,1)_FB_D(02,07)    OK       126      Up
SF_30_02_FB_D(05,06) -> FPC1_T_SG(0,2,2)_FB_D(02,06)    OK       126      Up
SF_30_02_FB_D(05,05) -> FPC1_T_SG(0,2,3)_FB_D(02,05)    OK       126      Up
SF_30_02_FB_D(05,03) -> FPC1_T_SG(0,2,4)_FB_D(02,03)    OK       126      Up
SF_30_02_FB_D(05,02) -> FPC1_T_SG(0,2,5)_FB_D(02,02)    OK       126      Up
SF_30_02_FB_D(05,01) -> FPC1_T_SG(0,2,6)_FB_D(02,01)    OK       126      Up
SF_30_02_FB_D(05,00) -> FPC1_T_SG(0,2,7)_FB_D(02,00)    OK       126      Up
SF_30_03_FB_B(17,08) -> FPC5_T_SG(2,2,0)_FB_B(14,08)    OK       133      Up
SF_30_03_FB_B(17,07) -> FPC5_T_SG(2,2,1)_FB_B(14,07)    OK       133      Up
SF_30_03_FB_B(17,06) -> FPC5_T_SG(2,2,2)_FB_B(14,06)    OK       133      Up
```

```
SF_30_03_FB_B(17,05) -> FPC5_T_SG(2,2,3)_FB_B(14,05)    OK       133      Up
SF_30_03_FB_B(17,03) -> FPC5_T_SG(2,2,4)_FB_B(14,03)    OK       133      Up
SF_30_03_FB_B(17,02) -> FPC5_T_SG(2,2,5)_FB_B(14,02)    OK       133      Up
SF_30_03_FB_B(17,01) -> FPC5_T_SG(2,2,6)_FB_B(14,01)    OK       133      Up
SF_30_03_FB_B(17,00) -> FPC5_T_SG(2,2,7)_FB_B(14,00)    OK       133      Up
SF_30_04_FB_C(10,11) -> FPC2_T_SG(1,0,0)_FB_C(07,11)    OK       140      Up
SF_30_04_FB_C(10,10) -> FPC2_T_SG(1,0,1)_FB_C(07,10)    OK       140      Up
SF_30_04_FB_C(10,09) -> FPC2_T_SG(1,0,2)_FB_C(07,09)    OK       140      Up
SF_30_04_FB_C(10,08) -> FPC2_T_SG(1,0,3)_FB_C(07,08)    OK       140      Up
SF_30_04_FB_C(10,07) -> FPC2_T_SG(1,0,4)_FB_C(07,07)    OK       140      Up
SF_30_04_FB_C(10,06) -> FPC2_T_SG(1,0,5)_FB_C(07,06)    OK       140      Up
SF_30_04_FB_C(10,05) -> FPC2_T_SG(1,0,6)_FB_C(07,05)    OK       140      Up
SF_30_04_FB_C(10,04) -> FPC2_T_SG(1,0,7)_FB_C(07,04)    OK       140      Up
SF_30_05_FB_A(22,11) -> FPC6_T_SG(3,0,0)_FB_A(19,11)    OK       147      Up
SF_30_05_FB_A(22,10) -> FPC6_T_SG(3,0,1)_FB_A(19,10)    OK       147      Up
SF_30_05_FB_A(22,09) -> FPC6_T_SG(3,0,2)_FB_A(19,09)    OK       147      Up
SF_30_05_FB_A(22,08) -> FPC6_T_SG(3,0,3)_FB_A(19,08)    OK       147      Up
SF_30_05_FB_A(22,07) -> FPC6_T_SG(3,0,4)_FB_A(19,07)    OK       147      Up
SF_30_05_FB_A(22,06) -> FPC6_T_SG(3,0,5)_FB_A(19,06)    OK       147      Up
SF_30_05_FB_A(22,05) -> FPC6_T_SG(3,0,6)_FB_A(19,05)    OK       147      Up
SF_30_05_FB_A(22,04) -> FPC6_T_SG(3,0,7)_FB_A(19,04)    OK       147      Up
SF_30_06_FB_C(11,08) -> FPC3_T_SG(1,2,0)_FB_C(08,08)    OK       154      Up
SF_30_06_FB_C(11,07) -> FPC3_T_SG(1,2,1)_FB_C(08,07)    OK       154      Up
SF_30_06_FB_C(11,06) -> FPC3_T_SG(1,2,2)_FB_C(08,06)    OK       154      Up
SF_30_06_FB_C(11,05) -> FPC3_T_SG(1,2,3)_FB_C(08,05)    OK       154      Up
SF_30_06_FB_C(11,03) -> FPC3_T_SG(1,2,4)_FB_C(08,03)    OK       154      Up
SF_30_06_FB_C(11,02) -> FPC3_T_SG(1,2,5)_FB_C(08,02)    OK       154      Up
SF_30_06_FB_C(11,01) -> FPC3_T_SG(1,2,6)_FB_C(08,01)    OK       154      Up
SF_30_06_FB_C(11,00) -> FPC3_T_SG(1,2,7)_FB_C(08,00)    OK       154      Up
...
```

show chassis fabric topology lcc (TX Matrix Plus Router)

```
user@host> show chassis fabric topology lcc 0
lcc0-re0:
--------------------------------------------------------------------------

SIB0
=========

Out-Links:
=========
LCC00_ST_SIB_L00              -> SFC0_F13_SIB_00         VCSEL    HSL2    HSL2
                                                         Status   Channel Status
================================================================================
FPC0_T_SG(0,0,0)_FB_D(04,11) -> SF_10_00_FB_D(01,11)    OK       12       Up
FPC0_T_SG(0,0,1)_FB_D(04,10) -> SF_10_00_FB_D(01,10)    OK       12       Up
FPC0_T_SG(0,0,2)_FB_D(04,09) -> SF_10_00_FB_D(01,09)    OK       12       Up
FPC0_T_SG(0,0,3)_FB_D(04,08) -> SF_10_00_FB_D(01,08)    OK       12       Up
FPC0_T_SG(0,0,4)_FB_D(04,07) -> SF_10_00_FB_D(01,07)    OK       12       Up
FPC0_T_SG(0,0,5)_FB_D(04,06) -> SF_10_00_FB_D(01,06)    OK       12       Up
FPC0_T_SG(0,0,6)_FB_D(04,05) -> SF_10_00_FB_D(01,05)    OK       12       Up
FPC0_T_SG(0,0,7)_FB_D(04,04) -> SF_10_00_FB_D(01,04)    OK       12       Up
FPC0_B_SG(0,1,0)_FB_D(03,07) -> SF_10_10_FB_D(00,07)    OK       15       Up
FPC0_B_SG(0,1,1)_FB_D(03,06) -> SF_10_10_FB_D(00,06)    OK       15       Up
FPC0_B_SG(0,1,2)_FB_D(03,05) -> SF_10_10_FB_D(00,05)    OK       15       Up
FPC0_B_SG(0,1,3)_FB_D(03,04) -> SF_10_10_FB_D(00,04)    OK       15       Up
FPC0_B_SG(0,1,4)_FB_D(03,03) -> SF_10_10_FB_D(00,03)    OK       15       Up
FPC0_B_SG(0,1,5)_FB_D(03,02) -> SF_10_10_FB_D(00,02)    OK       15       Up
FPC0_B_SG(0,1,6)_FB_D(03,01) -> SF_10_10_FB_D(00,01)    OK       15       Up
FPC0_B_SG(0,1,7)_FB_D(03,00) -> SF_10_10_FB_D(00,00)    OK       15       Up
```



```
FPC1_T_SG(0,2,0)_FB_D(05,08) -> SF_10_02_FB_D(02,08)    OK        18        Up
FPC1_T_SG(0,2,1)_FB_D(05,07) -> SF_10_02_FB_D(02,07)    OK        18        Up
FPC1_T_SG(0,2,2)_FB_D(05,06) -> SF_10_02_FB_D(02,06)    OK        18        Up
FPC1_T_SG(0,2,3)_FB_D(05,05) -> SF_10_02_FB_D(02,05)    OK        18        Up
FPC1_T_SG(0,2,4)_FB_D(05,03) -> SF_10_02_FB_D(02,03)    OK        18        Up
FPC1_T_SG(0,2,5)_FB_D(05,02) -> SF_10_02_FB_D(02,02)    OK        18        Up
FPC1_T_SG(0,2,6)_FB_D(05,01) -> SF_10_02_FB_D(02,01)    OK        18        Up
FPC1_T_SG(0,2,7)_FB_D(05,00) -> SF_10_02_FB_D(02,00)    OK        18        Up
FPC1_B_SG(0,3,0)_FB_D(04,03) -> SF_10_11_FB_D(01,03)    OK        21        Up
FPC1_B_SG(0,3,1)_FB_D(04,02) -> SF_10_11_FB_D(01,02)    OK        21        Up
FPC1_B_SG(0,3,2)_FB_D(04,01) -> SF_10_11_FB_D(01,01)    OK        21        Up
FPC1_B_SG(0,3,3)_FB_D(04,00) -> SF_10_11_FB_D(01,00)    OK        21        Up
FPC1_B_SG(0,3,4)_FB_D(03,11) -> SF_10_11_FB_D(00,11)    OK        21        Up
FPC1_B_SG(0,3,5)_FB_D(03,10) -> SF_10_11_FB_D(00,10)    OK        21        Up
FPC1_B_SG(0,3,6)_FB_D(03,09) -> SF_10_11_FB_D(00,09)    OK        21        Up
FPC1_B_SG(0,3,7)_FB_D(03,08) -> SF_10_11_FB_D(00,08)    OK        21        Up
FPC2_T_SG(1,0,0)_FB_C(10,11) -> SF_10_04_FB_C(07,11)    OK        12        Up
FPC2_T_SG(1,0,1)_FB_C(10,10) -> SF_10_04_FB_C(07,10)    OK        12        Up
FPC2_T_SG(1,0,2)_FB_C(10,09) -> SF_10_04_FB_C(07,09)    OK        12        Up
FPC2_T_SG(1,0,3)_FB_C(10,08) -> SF_10_04_FB_C(07,08)    OK        12        Up
FPC2_T_SG(1,0,4)_FB_C(10,07) -> SF_10_04_FB_C(07,07)    OK        12        Up
FPC2_T_SG(1,0,5)_FB_C(10,06) -> SF_10_04_FB_C(07,06)    OK        12        Up
FPC2_T_SG(1,0,6)_FB_C(10,05) -> SF_10_04_FB_C(07,05)    OK        12        Up
FPC2_T_SG(1,0,7)_FB_C(10,04) -> SF_10_04_FB_C(07,04)    OK        12        Up
FPC2_B_SG(1,1,0)_FB_C(09,07) -> SF_10_14_FB_C(06,07)    OK        15        Up
FPC2_B_SG(1,1,1)_FB_C(09,06) -> SF_10_14_FB_C(06,06)    OK        15        Up
FPC2_B_SG(1,1,2)_FB_C(09,05) -> SF_10_14_FB_C(06,05)    OK        15        Up
FPC2_B_SG(1,1,3)_FB_C(09,04) -> SF_10_14_FB_C(06,04)    OK        15        Up
FPC2_B_SG(1,1,4)_FB_C(09,03) -> SF_10_14_FB_C(06,03)    OK        15        Up
FPC2_B_SG(1,1,5)_FB_C(09,02) -> SF_10_14_FB_C(06,02)    OK        15        Up
FPC2_B_SG(1,1,6)_FB_C(09,01) -> SF_10_14_FB_C(06,01)    OK        15        Up
FPC2_B_SG(1,1,7)_FB_C(09,00) -> SF_10_14_FB_C(06,00)    OK        15        Up
FPC3_T_SG(1,2,0)_FB_C(11,08) -> SF_10_06_FB_C(08,08)    OK        18        Up
FPC3_T_SG(1,2,1)_FB_C(11,07) -> SF_10_06_FB_C(08,07)    OK        18        Up
FPC3_T_SG(1,2,2)_FB_C(11,06) -> SF_10_06_FB_C(08,06)    OK        18        Up
FPC3_T_SG(1,2,3)_FB_C(11,05) -> SF_10_06_FB_C(08,05)    OK        18        Up
FPC3_T_SG(1,2,4)_FB_C(11,03) -> SF_10_06_FB_C(08,03)    OK        18        Up
FPC3_T_SG(1,2,5)_FB_C(11,02) -> SF_10_06_FB_C(08,02)    OK        18        Up
FPC3_T_SG(1,2,6)_FB_C(11,01) -> SF_10_06_FB_C(08,01)    OK        18        Up
...
```

show chassis fabric topology (T4000 Core Router)

```
user@host> show chassis fabric topology 0
 fchip (mode)
          In-links               State            Out-links              State
--------------------------------------------------------------------------------


SIB0 :
---------

Onboard Links
-------------
SIB0_XF1,14_0->SIB0_XF,00_0     Up      SIB0_XF,00_0->SIB0_XF1,14_0      Up
SIB0_XF,00_0->SIB0_XF1,14_0     Up      SIB0_XF1,14_0->SIB0_XF,00_0      Up
SIB0_XF1,13_0->SIB0_XF,01_0     Up      SIB0_XF,01_0->SIB0_XF1,13_0      Up
SIB0_XF,01_0->SIB0_XF1,13_0     Up      SIB0_XF1,13_0->SIB0_XF,01_0      Up
SIB0_XF1,12_0->SIB0_XF,02_0     Up      SIB0_XF,02_0->SIB0_XF1,12_0      Up
SIB0_XF,02_0->SIB0_XF1,12_0     Up      SIB0_XF1,12_0->SIB0_XF,02_0      Up
SIB0_XF1,11_0->SIB0_XF,03_0     Up      SIB0_XF,03_0->SIB0_XF1,11_0      Up
```

```
SIB0_XF,03_0->SIB0_XF1,11_0         Up       SIB0_XF1,11_0->SIB0_XF,03_0        Up
SIB0_XF1,10_0->SIB0_XF,04_0         Up       SIB0_XF,04_0->SIB0_XF1,10_0        Up
SIB0_XF,04_0->SIB0_XF1,10_0         Up       SIB0_XF1,10_0->SIB0_XF,04_0        Up
SIB0_XF1,09_0->SIB0_XF,05_0         Up       SIB0_XF,05_0->SIB0_XF1,09_0        Up
SIB0_XF,05_0->SIB0_XF1,09_0         Up       SIB0_XF1,09_0->SIB0_XF,05_0        Up
SIB0_XF2,14_0->SIB0_XF,06_0         Up       SIB0_XF,06_0->SIB0_XF2,14_0        Up
SIB0_XF,06_0->SIB0_XF2,14_0         Up       SIB0_XF2,14_0->SIB0_XF,06_0        Up
SIB0_XF2,13_0->SIB0_XF,07_0         Up       SIB0_XF,07_0->SIB0_XF2,13_0        Up
SIB0_XF,07_0->SIB0_XF2,13_0         Up       SIB0_XF2,13_0->SIB0_XF,07_0        Up
SIB0_XF2,12_0->SIB0_XF,08_0         Up       SIB0_XF,08_0->SIB0_XF2,12_0        Up
SIB0_XF,08_0->SIB0_XF2,12_0         Up       SIB0_XF2,12_0->SIB0_XF,08_0        Up
SIB0_XF2,11_0->SIB0_XF,09_0         Up       SIB0_XF,09_0->SIB0_XF2,11_0        Up
SIB0_XF,09_0->SIB0_XF2,11_0         Up       SIB0_XF2,11_0->SIB0_XF,09_0        Up
SIB0_XF2,10_0->SIB0_XF,10_0         Up       SIB0_XF,10_0->SIB0_XF2,10_0        Up
SIB0_XF,10_0->SIB0_XF2,10_0         Up       SIB0_XF2,10_0->SIB0_XF,10_0        Up
SIB0_XF2,09_0->SIB0_XF,11_0         Up       SIB0_XF,11_0->SIB0_XF2,09_0        Up
SIB0_XF,11_0->SIB0_XF2,09_0         Up       SIB0_XF2,09_0->SIB0_XF,11_0        Up
SIB0_XF3,13_0->SIB0_XF,12_0         Up       SIB0_XF,12_0->SIB0_XF3,13_0        Up
SIB0_XF,12_0->SIB0_XF3,13_0         Up       SIB0_XF3,13_0->SIB0_XF,12_0        Up
SIB0_XF3,12_0->SIB0_XF,13_0         Up       SIB0_XF,13_0->SIB0_XF3,12_0        Up
SIB0_XF,13_0->SIB0_XF3,12_0         Up       SIB0_XF3,12_0->SIB0_XF,13_0        Up
SIB0_XF3,11_0->SIB0_XF,14_0         Up       SIB0_XF,14_0->SIB0_XF3,11_0        Up
SIB0_XF,14_0->SIB0_XF3,11_0         Up       SIB0_XF3,11_0->SIB0_XF,14_0        Up
SIB0_XF3,10_0->SIB0_XF,15_0         Up       SIB0_XF,15_0->SIB0_XF3,10_0        Up
SIB0_XF,15_0->SIB0_XF3,10_0         Up       SIB0_XF3,10_0->SIB0_XF,15_0        Up

PFE Links
---------------
FPC2PFE0->SIB0_XF1,05_0             Up       SIB0_XF1,05_0->FPC2PFE0            Up
FPC3PFE0->SIB0_XF2,15_0             Up       SIB0_XF2,15_0->FPC3PFE0            Up
FPC5PFE0->SIB0_XF2,05_0             Up       SIB0_XF2,05_0->FPC5PFE0            Up
FPC5PFE1->SIB0_XF2,07_0             Up       SIB0_XF2,07_0->FPC5PFE1            Up
FPC6PFE0->SIB0_XF3,01_0             Up       SIB0_XF3,01_0->FPC6PFE0            Up
FPC6PFE0->SIB0_XF3,01_1             Up       SIB0_XF3,01_1->FPC6PFE0            Up
FPC6PFE0->SIB0_XF3,02_0             Up       SIB0_XF3,02_0->FPC6PFE0            Up
FPC6PFE1->SIB0_XF3,03_0             Up       SIB0_XF3,03_0->FPC6PFE1            Up
FPC6PFE1->SIB0_XF3,03_1             Up       SIB0_XF3,03_1->FPC6PFE1            Up
FPC6PFE1->SIB0_XF3,02_1             Up       SIB0_XF3,02_1->FPC6PFE1            Up
```

show chassis fabric topology lcc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric topology lcc 6
lcc6-re0:
---------------------------------------------------------------------------
  fchip (mode)
          In-links                 State            Out-links              State
---------------------------------------------------------------------------------
SIB0 :
---------
CXP0_Evn->LCC_SIB0_XF3,10_0         Up       LCC_SIB0_XF3,10_0->CXP0_Evn        Up
CXP0_Odd->LCC_SIB0_XF3,11_0         Up       LCC_SIB0_XF3,11_0->CXP0_Odd        Up
CXP1_Evn->LCC_SIB0_XF3,12_0         Up       LCC_SIB0_XF3,12_0->CXP1_Evn        Up
CXP1_Odd->LCC_SIB0_XF3,13_0         Up       LCC_SIB0_XF3,13_0->CXP1_Odd        Up
CXP2_Evn->LCC_SIB0_XF2,09_0         Up       LCC_SIB0_XF2,09_0->CXP2_Evn        Up
CXP2_Odd->LCC_SIB0_XF2,10_0         Up       LCC_SIB0_XF2,10_0->CXP2_Odd        Up
CXP3_Evn->LCC_SIB0_XF2,11_0         Up       LCC_SIB0_XF2,11_0->CXP3_Evn        Up
CXP3_Odd->LCC_SIB0_XF2,12_0         Up       LCC_SIB0_XF2,12_0->CXP3_Odd        Up
CXP4_Evn->LCC_SIB0_XF2,13_0         Up       LCC_SIB0_XF2,13_0->CXP4_Evn        Up
CXP4_Odd->LCC_SIB0_XF1,09_0         Up       LCC_SIB0_XF1,09_0->CXP4_Odd        Up
CXP5_Evn->LCC_SIB0_XF2,14_0         Up       LCC_SIB0_XF2,14_0->CXP5_Evn        Up
CXP5_Odd->LCC_SIB0_XF1,10_0         Up       LCC_SIB0_XF1,10_0->CXP5_Odd        Up
```

```
CXP6_Evn->LCC_SIB0_XF1,11_0       Up      LCC_SIB0_XF1,11_0->CXP6_Evn       Up
CXP6_Odd->LCC_SIB0_XF1,12_0       Up      LCC_SIB0_XF1,12_0->CXP6_Odd       Up
CXP7_Evn->LCC_SIB0_XF1,13_0       Up      LCC_SIB0_XF1,13_0->CXP7_Evn       Up
CXP7_Odd->LCC_SIB0_XF1,14_0       Up      LCC_SIB0_XF1,14_0->CXP7_Odd       Up
SIB1 :
---------
SIB2 :
---------
CXP0_Evn->LCC_SIB2_XF3,10_0       Up      LCC_SIB2_XF3,10_0->CXP0_Evn       Up
CXP0_Odd->LCC_SIB2_XF3,11_0       Up      LCC_SIB2_XF3,11_0->CXP0_Odd       Up
CXP1_Evn->LCC_SIB2_XF3,12_0       Up      LCC_SIB2_XF3,12_0->CXP1_Evn       Up
CXP1_Odd->LCC_SIB2_XF3,13_0       Up      LCC_SIB2_XF3,13_0->CXP1_Odd       Up
CXP2_Evn->LCC_SIB2_XF2,09_0       Up      LCC_SIB2_XF2,09_0->CXP2_Evn       Up
CXP2_Odd->LCC_SIB2_XF2,10_0       Up      LCC_SIB2_XF2,10_0->CXP2_Odd       Up
CXP3_Evn->LCC_SIB2_XF2,11_0       Up      LCC_SIB2_XF2,11_0->CXP3_Evn       Up
CXP3_Odd->LCC_SIB2_XF2,12_0       Up      LCC_SIB2_XF2,12_0->CXP3_Odd       Up
CXP4_Evn->LCC_SIB2_XF2,13_0       Up      LCC_SIB2_XF2,13_0->CXP4_Evn       Up
CXP4_Odd->LCC_SIB2_XF1,09_0       Up      LCC_SIB2_XF1,09_0->CXP4_Odd       Up
CXP5_Evn->LCC_SIB2_XF2,14_0       Up      LCC_SIB2_XF2,14_0->CXP5_Evn       Up
CXP5_Odd->LCC_SIB2_XF1,10_0       Up      LCC_SIB2_XF1,10_0->CXP5_Odd       Up
CXP6_Evn->LCC_SIB2_XF1,11_0       Up      LCC_SIB2_XF1,11_0->CXP6_Evn       Up
CXP6_Odd->LCC_SIB2_XF1,12_0       Up      LCC_SIB2_XF1,12_0->CXP6_Odd       Up
CXP7_Evn->LCC_SIB2_XF1,13_0       Up      LCC_SIB2_XF1,13_0->CXP7_Evn       Up
CXP7_Odd->LCC_SIB2_XF1,14_0       Up      LCC_SIB2_XF1,14_0->CXP7_Odd       Up
SIB3 :
---------
CXP0_Evn->LCC_SIB3_XF3,10_0       Up      LCC_SIB3_XF3,10_0->CXP0_Evn       Up
CXP0_Odd->LCC_SIB3_XF3,11_0       Up      LCC_SIB3_XF3,11_0->CXP0_Odd       Up
CXP1_Evn->LCC_SIB3_XF3,12_0       Up      LCC_SIB3_XF3,12_0->CXP1_Evn       Up
CXP1_Odd->LCC_SIB3_XF3,13_0       Up      LCC_SIB3_XF3,13_0->CXP1_Odd       Up
CXP2_Evn->LCC_SIB3_XF2,09_0       Up      LCC_SIB3_XF2,09_0->CXP2_Evn       Up
CXP2_Odd->LCC_SIB3_XF2,10_0       Up      LCC_SIB3_XF2,10_0->CXP2_Odd       Up
CXP3_Evn->LCC_SIB3_XF2,11_0       Up      LCC_SIB3_XF2,11_0->CXP3_Evn       Up
CXP3_Odd->LCC_SIB3_XF2,12_0       Up      LCC_SIB3_XF2,12_0->CXP3_Odd       Up
CXP4_Evn->LCC_SIB3_XF2,13_0       Up      LCC_SIB3_XF2,13_0->CXP4_Evn       Up
CXP4_Odd->LCC_SIB3_XF1,09_0       Up      LCC_SIB3_XF1,09_0->CXP4_Odd       Up
CXP5_Evn->LCC_SIB3_XF2,14_0       Up      LCC_SIB3_XF2,14_0->CXP5_Evn       Up
CXP5_Odd->LCC_SIB3_XF1,10_0       Up      LCC_SIB3_XF1,10_0->CXP5_Odd       Up
CXP6_Evn->LCC_SIB3_XF1,11_0       Up      LCC_SIB3_XF1,11_0->CXP6_Evn       Up
CXP6_Odd->LCC_SIB3_XF1,12_0       Up      LCC_SIB3_XF1,12_0->CXP6_Odd       Up
CXP7_Evn->LCC_SIB3_XF1,13_0       Up      LCC_SIB3_XF1,13_0->CXP7_Evn       Up
CXP7_Odd->LCC_SIB3_XF1,14_0       Up      LCC_SIB3_XF1,14_0->CXP7_Odd       Up
SIB4 :
---------
CXP0_Evn->LCC_SIB4_XF3,10_0       Up      LCC_SIB4_XF3,10_0->CXP0_Evn       Up
CXP0_Odd->LCC_SIB4_XF3,11_0       Up      LCC_SIB4_XF3,11_0->CXP0_Odd       Up
CXP1_Evn->LCC_SIB4_XF3,12_0       Up      LCC_SIB4_XF3,12_0->CXP1_Evn       Up
CXP1_Odd->LCC_SIB4_XF3,13_0       Up      LCC_SIB4_XF3,13_0->CXP1_Odd       Up
CXP2_Evn->LCC_SIB4_XF2,09_0       Up      LCC_SIB4_XF2,09_0->CXP2_Evn       Up
CXP2_Odd->LCC_SIB4_XF2,10_0       Up      LCC_SIB4_XF2,10_0->CXP2_Odd       Up
CXP3_Evn->LCC_SIB4_XF2,11_0       Up      LCC_SIB4_XF2,11_0->CXP3_Evn       Up
CXP3_Odd->LCC_SIB4_XF2,12_0       Up      LCC_SIB4_XF2,12_0->CXP3_Odd       Up
CXP4_Evn->LCC_SIB4_XF2,13_0       Up      LCC_SIB4_XF2,13_0->CXP4_Evn       Up
CXP4_Odd->LCC_SIB4_XF1,09_0       Up      LCC_SIB4_XF1,09_0->CXP4_Odd       Up
CXP5_Evn->LCC_SIB4_XF2,14_0       Up      LCC_SIB4_XF2,14_0->CXP5_Evn       Up
CXP5_Odd->LCC_SIB4_XF1,10_0       Up      LCC_SIB4_XF1,10_0->CXP5_Odd       Up
CXP6_Evn->LCC_SIB4_XF1,11_0       Up      LCC_SIB4_XF1,11_0->CXP6_Evn       Up
CXP6_Odd->LCC_SIB4_XF1,12_0       Up      LCC_SIB4_XF1,12_0->CXP6_Odd       Up
CXP7_Evn->LCC_SIB4_XF1,13_0       Up      LCC_SIB4_XF1,13_0->CXP7_Evn       Up
CXP7_Odd->LCC_SIB4_XF1,14_0       Up      LCC_SIB4_XF1,14_0->CXP7_Odd       Up
```


show chassis fabric topology sfc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric topology sfc 0
sfc0-re0:
--------------------------------------------------------------------------
  fchip (mode)
          In-links                State             Out-links              State
--------------------------------------------------------------------------------
F13_SIB0 :
---------
CXP0_Evn->F13_SIB0_XF2,04_0       Up       F13_SIB0_XF2,04_0->CXP0_Evn       Up
CXP0_Odd->F13_SIB0_XF2,03_0       Up       F13_SIB0_XF2,03_0->CXP0_Odd       Up
CXP1_Evn->F13_SIB0_XF2,06_0       Up       F13_SIB0_XF2,06_0->CXP1_Evn       Up
CXP1_Odd->F13_SIB0_XF2,05_0       Up       F13_SIB0_XF2,05_0->CXP1_Odd       Up
CXP2_Evn->F13_SIB0_XF2,08_0       Up       F13_SIB0_XF2,08_0->CXP2_Evn       Up
CXP2_Odd->F13_SIB0_XF2,07_0       Up       F13_SIB0_XF2,07_0->CXP2_Odd       Up
CXP3_Evn->F13_SIB0_XF2,10_0       Up       F13_SIB0_XF2,10_0->CXP3_Evn       Up
CXP3_Odd->F13_SIB0_XF2,09_0       Up       F13_SIB0_XF2,09_0->CXP3_Odd       Up
CXP4_Evn->F13_SIB0_XF0,04_0       Up       F13_SIB0_XF0,04_0->CXP4_Evn       Up
CXP4_Odd->F13_SIB0_XF0,03_0       Up       F13_SIB0_XF0,03_0->CXP4_Odd       Up
CXP5_Evn->F13_SIB0_XF0,06_0       Up       F13_SIB0_XF0,06_0->CXP5_Evn       Up
CXP5_Odd->F13_SIB0_XF0,05_0       Up       F13_SIB0_XF0,05_0->CXP5_Odd       Up
CXP6_Evn->F13_SIB0_XF0,08_0       Up       F13_SIB0_XF0,08_0->CXP6_Evn       Up
CXP6_Odd->F13_SIB0_XF0,07_0       Up       F13_SIB0_XF0,07_0->CXP6_Odd       Up
CXP7_Evn->F13_SIB0_XF0,10_0       Up       F13_SIB0_XF0,10_0->CXP7_Evn       Up
CXP7_Odd->F13_SIB0_XF0,09_0       Up       F13_SIB0_XF0,09_0->CXP7_Odd       Up
CXP8_Evn->F13_SIB0_XF3,04_0       Up       F13_SIB0_XF3,04_0->CXP8_Evn       Up
CXP8_Odd->F13_SIB0_XF3,03_0       Up       F13_SIB0_XF3,03_0->CXP8_Odd       Up
CXP9_Evn->F13_SIB0_XF3,06_0       Up       F13_SIB0_XF3,06_0->CXP9_Evn       Up
CXP9_Odd->F13_SIB0_XF3,05_0       Up       F13_SIB0_XF3,05_0->CXP9_Odd       Up
CXP10_Evn->F13_SIB0_XF3,08_0      Up       F13_SIB0_XF3,08_0->CXP10_Evn      Up
CXP10_Odd->F13_SIB0_XF3,07_0      Up       F13_SIB0_XF3,07_0->CXP10_Odd      Up
CXP11_Evn->F13_SIB0_XF3,10_0      Up       F13_SIB0_XF3,10_0->CXP11_Evn      Up
CXP11_Odd->F13_SIB0_XF3,09_0      Up       F13_SIB0_XF3,09_0->CXP11_Odd      Up
CXP12_Evn->F13_SIB0_XF1,04_0      Up       F13_SIB0_XF1,04_0->CXP12_Evn      Up
CXP12_Odd->F13_SIB0_XF1,03_0      Up       F13_SIB0_XF1,03_0->CXP12_Odd      Up
CXP13_Evn->F13_SIB0_XF1,06_0      Up       F13_SIB0_XF1,06_0->CXP13_Evn      Up
CXP13_Odd->F13_SIB0_XF1,05_0      Up       F13_SIB0_XF1,05_0->CXP13_Odd      Up
CXP14_Evn->F13_SIB0_XF1,08_0      Up       F13_SIB0_XF1,08_0->CXP14_Evn      Up
CXP14_Odd->F13_SIB0_XF1,07_0      Up       F13_SIB0_XF1,07_0->CXP14_Odd      Up
CXP15_Evn->F13_SIB0_XF1,10_0      Up       F13_SIB0_XF1,10_0->CXP15_Evn      Up
CXP15_Odd->F13_SIB0_XF1,09_0      Up       F13_SIB0_XF1,09_0->CXP15_Odd      Up
F13_SIB0_XF4,00_0->F13_SIB0_XF2,02_0 Up  F13_SIB0_XF2,02_0->F13_SIB0_XF4,00_0 Up

F13_SIB0_XF4,01_0->F13_SIB0_XF2,01_0 Up  F13_SIB0_XF2,01_0->F13_SIB0_XF4,01_0 Up

F13_SIB0_XF4,02_0->F13_SIB0_XF2,00_0 Up  F13_SIB0_XF2,00_0->F13_SIB0_XF4,02_0 Up

F13_SIB0_XF4,03_0->F13_SIB0_XF2,15_0 Up  F13_SIB0_XF2,15_0->F13_SIB0_XF4,03_0 Up

F13_SIB0_XF4,04_0->F13_SIB0_XF2,14_0 Up  F13_SIB0_XF2,14_0->F13_SIB0_XF4,04_0 Up

F13_SIB0_XF4,05_0->F13_SIB0_XF2,13_0 Up  F13_SIB0_XF2,13_0->F13_SIB0_XF4,05_0 Up

F13_SIB0_XF4,06_0->F13_SIB0_XF2,12_0 Up  F13_SIB0_XF2,12_0->F13_SIB0_XF4,06_0 Up

F13_SIB0_XF4,07_0->F13_SIB0_XF2,11_0 Up  F13_SIB0_XF2,11_0->F13_SIB0_XF4,07_0 Up

F13_SIB0_XF4,08_0->F13_SIB0_XF0,02_0 Up  F13_SIB0_XF0,02_0->F13_SIB0_XF4,08_0 Up

F13_SIB0_XF4,09_0->F13_SIB0_XF0,01_0 Up  F13_SIB0_XF0,01_0->F13_SIB0_XF4,09_0 Up
```



```
F13_SIB0_XF4,10_0->F13_SIB0_XF0,00_0 Up  F13_SIB0_XF0,00_0->F13_SIB0_XF4,10_0 Up
F13_SIB0_XF4,11_0->F13_SIB0_XF0,15_0 Up  F13_SIB0_XF0,15_0->F13_SIB0_XF4,11_0 Up
F13_SIB0_XF4,12_0->F13_SIB0_XF0,14_0 Up  F13_SIB0_XF0,14_0->F13_SIB0_XF4,12_0 Up
F13_SIB0_XF4,13_0->F13_SIB0_XF0,13_0 Up  F13_SIB0_XF0,13_0->F13_SIB0_XF4,13_0 Up
F13_SIB0_XF4,14_0->F13_SIB0_XF0,12_0 Up  F13_SIB0_XF0,12_0->F13_SIB0_XF4,14_0 Up
F13_SIB0_XF4,15_0->F13_SIB0_XF0,11_0 Up  F13_SIB0_XF0,11_0->F13_SIB0_XF4,15_0 Up
F13_SIB0_XF6,08_0->F13_SIB0_XF3,02_0 Up  F13_SIB0_XF3,02_0->F13_SIB0_XF6,08_0 Up
F13_SIB0_XF6,09_0->F13_SIB0_XF3,01_0 Up  F13_SIB0_XF3,01_0->F13_SIB0_XF6,09_0 Up
F13_SIB0_XF6,10_0->F13_SIB0_XF3,00_0 Up  F13_SIB0_XF3,00_0->F13_SIB0_XF6,10_0 Up
F13_SIB0_XF6,11_0->F13_SIB0_XF3,15_0 Up  F13_SIB0_XF3,15_0->F13_SIB0_XF6,11_0 Up
F13_SIB0_XF6,12_0->F13_SIB0_XF3,14_0 Up  F13_SIB0_XF3,14_0->F13_SIB0_XF6,12_0 Up
F13_SIB0_XF6,13_0->F13_SIB0_XF3,13_0 Up  F13_SIB0_XF3,13_0->F13_SIB0_XF6,13_0 Up
F13_SIB0_XF6,14_0->F13_SIB0_XF3,12_0 Up  F13_SIB0_XF3,12_0->F13_SIB0_XF6,14_0 Up
F13_SIB0_XF6,15_0->F13_SIB0_XF3,11_0 Up  F13_SIB0_XF3,11_0->F13_SIB0_XF6,15_0 Up
F13_SIB0_XF6,00_0->F13_SIB0_XF1,02_0 Up  F13_SIB0_XF1,02_0->F13_SIB0_XF6,00_0 Up
F13_SIB0_XF6,01_0->F13_SIB0_XF1,01_0 Up  F13_SIB0_XF1,01_0->F13_SIB0_XF6,01_0 Up
F13_SIB0_XF6,02_0->F13_SIB0_XF1,00_0 Up  F13_SIB0_XF1,00_0->F13_SIB0_XF6,02_0 Up
F13_SIB0_XF6,03_0->F13_SIB0_XF1,15_0 Up  F13_SIB0_XF1,15_0->F13_SIB0_XF6,03_0 Up
F13_SIB0_XF6,04_0->F13_SIB0_XF1,14_0 Up  F13_SIB0_XF1,14_0->F13_SIB0_XF6,04_0 Up
F13_SIB0_XF6,05_0->F13_SIB0_XF1,13_0 Up  F13_SIB0_XF1,13_0->F13_SIB0_XF6,05_0 Up
F13_SIB0_XF6,06_0->F13_SIB0_XF1,12_0 Up  F13_SIB0_XF1,12_0->F13_SIB0_XF6,06_0 Up
F13_SIB0_XF6,07_0->F13_SIB0_XF1,11_0 Up  F13_SIB0_XF1,11_0->F13_SIB0_XF6,07_0 Up
F13_SIB0_XF2,02_0->F13_SIB0_XF5,00_0 Up  F13_SIB0_XF5,00_0->F13_SIB0_XF2,02_0 Up
F13_SIB0_XF2,01_0->F13_SIB0_XF5,01_0 Up  F13_SIB0_XF5,01_0->F13_SIB0_XF2,01_0 Up
F13_SIB0_XF2,00_0->F13_SIB0_XF5,02_0 Up  F13_SIB0_XF5,02_0->F13_SIB0_XF2,00_0 Up
F13_SIB0_XF2,15_0->F13_SIB0_XF5,03_0 Up  F13_SIB0_XF5,03_0->F13_SIB0_XF2,15_0 Up
F13_SIB0_XF2,14_0->F13_SIB0_XF5,04_0 Up  F13_SIB0_XF5,04_0->F13_SIB0_XF2,14_0 Up
F13_SIB0_XF2,13_0->F13_SIB0_XF5,05_0 Up  F13_SIB0_XF5,05_0->F13_SIB0_XF2,13_0 Up
F13_SIB0_XF2,12_0->F13_SIB0_XF5,06_0 Up  F13_SIB0_XF5,06_0->F13_SIB0_XF2,12_0 Up
F13_SIB0_XF2,11_0->F13_SIB0_XF5,07_0 Up  F13_SIB0_XF5,07_0->F13_SIB0_XF2,11_0 Up
```



```
F13_SIB0_XF0,02_0->F13_SIB0_XF5,08_0 Up  F13_SIB0_XF5,08_0->F13_SIB0_XF0,02_0 Up
F13_SIB0_XF0,01_0->F13_SIB0_XF5,09_0 Up  F13_SIB0_XF5,09_0->F13_SIB0_XF0,01_0 Up
F13_SIB0_XF0,00_0->F13_SIB0_XF5,10_0 Up  F13_SIB0_XF5,10_0->F13_SIB0_XF0,00_0 Up
F13_SIB0_XF0,15_0->F13_SIB0_XF5,11_0 Up  F13_SIB0_XF5,11_0->F13_SIB0_XF0,15_0 Up
F13_SIB0_XF0,14_0->F13_SIB0_XF5,12_0 Up  F13_SIB0_XF5,12_0->F13_SIB0_XF0,14_0 Up
F13_SIB0_XF0,13_0->F13_SIB0_XF5,13_0 Up  F13_SIB0_XF5,13_0->F13_SIB0_XF0,13_0 Up
F13_SIB0_XF0,12_0->F13_SIB0_XF5,14_0 Up  F13_SIB0_XF5,14_0->F13_SIB0_XF0,12_0 Up
F13_SIB0_XF0,11_0->F13_SIB0_XF5,15_0 Up  F13_SIB0_XF5,15_0->F13_SIB0_XF0,11_0 Up
F13_SIB0_XF3,02_0->F13_SIB0_XF7,08_0 Up  F13_SIB0_XF7,08_0->F13_SIB0_XF3,02_0 Up
F13_SIB0_XF3,01_0->F13_SIB0_XF7,09_0 Up  F13_SIB0_XF7,09_0->F13_SIB0_XF3,01_0 Up
F13_SIB0_XF3,00_0->F13_SIB0_XF7,10_0 Up  F13_SIB0_XF7,10_0->F13_SIB0_XF3,00_0 Up
F13_SIB0_XF3,15_0->F13_SIB0_XF7,11_0 Up  F13_SIB0_XF7,11_0->F13_SIB0_XF3,15_0 Up
F13_SIB0_XF3,14_0->F13_SIB0_XF7,12_0 Up  F13_SIB0_XF7,12_0->F13_SIB0_XF3,14_0 Up
F13_SIB0_XF3,13_0->F13_SIB0_XF7,13_0 Up  F13_SIB0_XF7,13_0->F13_SIB0_XF3,13_0 Up
F13_SIB0_XF3,12_0->F13_SIB0_XF7,14_0 Up  F13_SIB0_XF7,14_0->F13_SIB0_XF3,12_0 Up
F13_SIB0_XF3,11_0->F13_SIB0_XF7,15_0 Up  F13_SIB0_XF7,15_0->F13_SIB0_XF3,11_0 Up
F13_SIB0_XF1,02_0->F13_SIB0_XF7,00_0 Up  F13_SIB0_XF7,00_0->F13_SIB0_XF1,02_0 Up
F13_SIB0_XF1,01_0->F13_SIB0_XF7,01_0 Up  F13_SIB0_XF7,01_0->F13_SIB0_XF1,01_0 Up
F13_SIB0_XF1,00_0->F13_SIB0_XF7,02_0 Up  F13_SIB0_XF7,02_0->F13_SIB0_XF1,00_0 Up
F13_SIB0_XF1,15_0->F13_SIB0_XF7,03_0 Up  F13_SIB0_XF7,03_0->F13_SIB0_XF1,15_0 Up
F13_SIB0_XF1,14_0->F13_SIB0_XF7,04_0 Up  F13_SIB0_XF7,04_0->F13_SIB0_XF1,14_0 Up
F13_SIB0_XF1,13_0->F13_SIB0_XF7,05_0 Up  F13_SIB0_XF7,05_0->F13_SIB0_XF1,13_0 Up
F13_SIB0_XF1,12_0->F13_SIB0_XF7,06_0 Up  F13_SIB0_XF7,06_0->F13_SIB0_XF1,12_0 Up
F13_SIB0_XF1,11_0->F13_SIB0_XF7,07_0 Up  F13_SIB0_XF7,07_0->F13_SIB0_XF1,11_0 Up
F2S_SIB2_XF,12_0->F13_SIB0_XF4,00_0 Up   F13_SIB0_XF4,00_0->F2S_SIB2_XF,12_0 Up
F2S_SIB2_XF,08_0->F13_SIB0_XF4,01_0 Up   F13_SIB0_XF4,01_0->F2S_SIB2_XF,08_0 Up
F2S_SIB2_XF,14_0->F13_SIB0_XF4,02_0 Up   F13_SIB0_XF4,02_0->F2S_SIB2_XF,14_0 Up
F2S_SIB2_XF,10_0->F13_SIB0_XF4,03_0 Up   F13_SIB0_XF4,03_0->F2S_SIB2_XF,10_0 Up
F2S_SIB3_XF,12_0->F13_SIB0_XF4,04_0 Up   F13_SIB0_XF4,04_0->F2S_SIB3_XF,12_0 Up
F2S_SIB3_XF,08_0->F13_SIB0_XF4,05_0 Up   F13_SIB0_XF4,05_0->F2S_SIB3_XF,08_0 Up
F2S_SIB3_XF,14_0->F13_SIB0_XF4,06_0 Up   F13_SIB0_XF4,06_0->F2S_SIB3_XF,14_0 Up
```

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F2S_SIB3_XF,10_0->F13_SIB0_XF4,07_0 Up   F13_SIB0_XF4,07_0->F2S_SIB3_XF,10_0 Up
F2S_SIB0_XF,12_0->F13_SIB0_XF4,08_0 Up   F13_SIB0_XF4,08_0->F2S_SIB0_XF,12_0 Up
F2S_SIB0_XF,08_0->F13_SIB0_XF4,09_0 Up   F13_SIB0_XF4,09_0->F2S_SIB0_XF,08_0 Up
F2S_SIB0_XF,14_0->F13_SIB0_XF4,10_0 Up   F13_SIB0_XF4,10_0->F2S_SIB0_XF,14_0 Up
F2S_SIB0_XF,10_0->F13_SIB0_XF4,11_0 Up   F13_SIB0_XF4,11_0->F2S_SIB0_XF,10_0 Up
F2S_SIB1_XF,12_0->F13_SIB0_XF4,12_0 Up   F13_SIB0_XF4,12_0->F2S_SIB1_XF,12_0 Up
F2S_SIB1_XF,08_0->F13_SIB0_XF4,13_0 Up   F13_SIB0_XF4,13_0->F2S_SIB1_XF,08_0 Up
F2S_SIB1_XF,14_0->F13_SIB0_XF4,14_0 Up   F13_SIB0_XF4,14_0->F2S_SIB1_XF,14_0 Up
F2S_SIB1_XF,10_0->F13_SIB0_XF4,15_0 Up   F13_SIB0_XF4,15_0->F2S_SIB1_XF,10_0 Up
F2S_SIB2_XF,13_0->F13_SIB0_XF6,00_0 Up   F13_SIB0_XF6,00_0->F2S_SIB2_XF,13_0 Up
F2S_SIB2_XF,09_0->F13_SIB0_XF6,01_0 Up   F13_SIB0_XF6,01_0->F2S_SIB2_XF,09_0 Up
F2S_SIB2_XF,15_0->F13_SIB0_XF6,02_0 Up   F13_SIB0_XF6,02_0->F2S_SIB2_XF,15_0 Up
F2S_SIB2_XF,11_0->F13_SIB0_XF6,03_0 Up   F13_SIB0_XF6,03_0->F2S_SIB2_XF,11_0 Up
F2S_SIB3_XF,13_0->F13_SIB0_XF6,04_0 Up   F13_SIB0_XF6,04_0->F2S_SIB3_XF,13_0 Up
F2S_SIB3_XF,09_0->F13_SIB0_XF6,05_0 Up   F13_SIB0_XF6,05_0->F2S_SIB3_XF,09_0 Up
F2S_SIB3_XF,15_0->F13_SIB0_XF6,06_0 Up   F13_SIB0_XF6,06_0->F2S_SIB3_XF,15_0 Up
F2S_SIB3_XF,11_0->F13_SIB0_XF6,07_0 Up   F13_SIB0_XF6,07_0->F2S_SIB3_XF,11_0 Up
F2S_SIB0_XF,13_0->F13_SIB0_XF6,08_0 Up   F13_SIB0_XF6,08_0->F2S_SIB0_XF,13_0 Up
F2S_SIB0_XF,09_0->F13_SIB0_XF6,09_0 Up   F13_SIB0_XF6,09_0->F2S_SIB0_XF,09_0 Up
F2S_SIB0_XF,15_0->F13_SIB0_XF6,10_0 Up   F13_SIB0_XF6,10_0->F2S_SIB0_XF,15_0 Up
F2S_SIB0_XF,11_0->F13_SIB0_XF6,11_0 Up   F13_SIB0_XF6,11_0->F2S_SIB0_XF,11_0 Up
F2S_SIB1_XF,13_0->F13_SIB0_XF6,12_0 Up   F13_SIB0_XF6,12_0->F2S_SIB1_XF,13_0 Up
F2S_SIB1_XF,09_0->F13_SIB0_XF6,13_0 Up   F13_SIB0_XF6,13_0->F2S_SIB1_XF,09_0 Up
F2S_SIB1_XF,15_0->F13_SIB0_XF6,14_0 Up   F13_SIB0_XF6,14_0->F2S_SIB1_XF,15_0 Up
F2S_SIB1_XF,11_0->F13_SIB0_XF6,15_0 Up   F13_SIB0_XF6,15_0->F2S_SIB1_XF,11_0 Up
F13_SIB0_XF5,00_0->F2S_SIB2_XF,12_0 Up   F2S_SIB2_XF,12_0->F13_SIB0_XF5,00_0 Up
F13_SIB0_XF5,01_0->F2S_SIB2_XF,08_0 Up   F2S_SIB2_XF,08_0->F13_SIB0_XF5,01_0 Up
F13_SIB0_XF5,02_0->F2S_SIB2_XF,14_0 Up   F2S_SIB2_XF,14_0->F13_SIB0_XF5,02_0 Up
F13_SIB0_XF5,03_0->F2S_SIB2_XF,10_0 Up   F2S_SIB2_XF,10_0->F13_SIB0_XF5,03_0 Up
F13_SIB0_XF5,04_0->F2S_SIB3_XF,12_0 Up   F2S_SIB3_XF,12_0->F13_SIB0_XF5,04_0 Up
```



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F13_SIB0_XF5,05_0->F2S_SIB3_XF,08_0 Up   F2S_SIB3_XF,08_0->F13_SIB0_XF5,05_0 Up
F13_SIB0_XF5,06_0->F2S_SIB3_XF,14_0 Up   F2S_SIB3_XF,14_0->F13_SIB0_XF5,06_0 Up
F13_SIB0_XF5,07_0->F2S_SIB3_XF,10_0 Up   F2S_SIB3_XF,10_0->F13_SIB0_XF5,07_0 Up
F13_SIB0_XF5,08_0->F2S_SIB0_XF,12_0 Up   F2S_SIB0_XF,12_0->F13_SIB0_XF5,08_0 Up
F13_SIB0_XF5,09_0->F2S_SIB0_XF,08_0 Up   F2S_SIB0_XF,08_0->F13_SIB0_XF5,09_0 Up
F13_SIB0_XF5,10_0->F2S_SIB0_XF,14_0 Up   F2S_SIB0_XF,14_0->F13_SIB0_XF5,10_0 Up
F13_SIB0_XF5,11_0->F2S_SIB0_XF,10_0 Up   F2S_SIB0_XF,10_0->F13_SIB0_XF5,11_0 Up
F13_SIB0_XF5,12_0->F2S_SIB1_XF,12_0 Up   F2S_SIB1_XF,12_0->F13_SIB0_XF5,12_0 Up
F13_SIB0_XF5,13_0->F2S_SIB1_XF,08_0 Up   F2S_SIB1_XF,08_0->F13_SIB0_XF5,13_0 Up
F13_SIB0_XF5,14_0->F2S_SIB1_XF,14_0 Up   F2S_SIB1_XF,14_0->F13_SIB0_XF5,14_0 Up
F13_SIB0_XF5,15_0->F2S_SIB1_XF,10_0 Up   F2S_SIB1_XF,10_0->F13_SIB0_XF5,15_0 Up
F13_SIB0_XF7,00_0->F2S_SIB2_XF,13_0 Up   F2S_SIB2_XF,13_0->F13_SIB0_XF7,00_0 Up
F13_SIB0_XF7,01_0->F2S_SIB2_XF,09_0 Up   F2S_SIB2_XF,09_0->F13_SIB0_XF7,01_0 Up
F13_SIB0_XF7,02_0->F2S_SIB2_XF,15_0 Up   F2S_SIB2_XF,15_0->F13_SIB0_XF7,02_0 Up
F13_SIB0_XF7,03_0->F2S_SIB2_XF,11_0 Up   F2S_SIB2_XF,11_0->F13_SIB0_XF7,03_0 Up
F13_SIB0_XF7,04_0->F2S_SIB3_XF,13_0 Up   F2S_SIB3_XF,13_0->F13_SIB0_XF7,04_0 Up
F13_SIB0_XF7,05_0->F2S_SIB3_XF,09_0 Up   F2S_SIB3_XF,09_0->F13_SIB0_XF7,05_0 Up
F13_SIB0_XF7,06_0->F2S_SIB3_XF,15_0 Up   F2S_SIB3_XF,15_0->F13_SIB0_XF7,06_0 Up
F13_SIB0_XF7,07_0->F2S_SIB3_XF,11_0 Up   F2S_SIB3_XF,11_0->F13_SIB0_XF7,07_0 Up
F13_SIB0_XF7,08_0->F2S_SIB0_XF,13_0 Up   F2S_SIB0_XF,13_0->F13_SIB0_XF7,08_0 Up
F13_SIB0_XF7,09_0->F2S_SIB0_XF,09_0 Up   F2S_SIB0_XF,09_0->F13_SIB0_XF7,09_0 Up
F13_SIB0_XF7,10_0->F2S_SIB0_XF,15_0 Up   F2S_SIB0_XF,15_0->F13_SIB0_XF7,10_0 Up
F13_SIB0_XF7,11_0->F2S_SIB0_XF,11_0 Up   F2S_SIB0_XF,11_0->F13_SIB0_XF7,11_0 Up
F13_SIB0_XF7,12_0->F2S_SIB1_XF,13_0 Up   F2S_SIB1_XF,13_0->F13_SIB0_XF7,12_0 Up
F13_SIB0_XF7,13_0->F2S_SIB1_XF,09_0 Up   F2S_SIB1_XF,09_0->F13_SIB0_XF7,13_0 Up
F13_SIB0_XF7,14_0->F2S_SIB1_XF,15_0 Up   F2S_SIB1_XF,15_0->F13_SIB0_XF7,14_0 Up
F13_SIB0_XF7,15_0->F2S_SIB1_XF,11_0 Up   F2S_SIB1_XF,11_0->F13_SIB0_XF7,15_0 Up

...
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show chassis fabric topology (PTX5000 Router)

`user@host>` **show chassis fabric topology**

```
In-link  : FPC# FE# TQ# (TQ-TX sub-chnl #) ->
           SIB# TF#_FCORE# (TF-RX port#, TF-RX sub-chn#, TF-RX inst#)

 Out-link : SIB# TF#_FCORE# (TF-TX port#, TF-TX sub-chn#, TF-TX inst#) ->
           FPC# FE# TQ# (TQ-RX sub-chnl #)
(6, 4, 06) in FPC02FE0TQ0(02)->S01F0_0(6,4,06) will be TF Rx Port 6, TF CCL Rx
Sub-Channel 4, TF CCL Rx Instance 6.
(2, 7, 10) in S01F0_0(2,7,10)->FPC02FE0TQ0(02) will be TF-Tx Port 2, TF CCL Tx
Sub-channel 7, TF CCL Tx Instance 10.
SIB 0 FCHIP 0 FCORE 0 :
-----------------------
          In-links              State            Out-links              State
--------------------------------------------------------------------------------
FPC00FE0TQ0(00)->S00F0_0(7,4,07) OK      S00F0_0(3,7,11)->FPC00FE0TQ0(00) OK
FPC00FE1TQ1(00)->S00F0_0(7,6,07) OK      S00F0_0(3,5,11)->FPC00FE1TQ1(00) OK
FPC00FE2TQ2(00)->S00F0_0(7,5,07) OK      S00F0_0(3,6,11)->FPC00FE2TQ2(00) OK
FPC00FE3TQ3(00)->S00F0_0(7,7,07) OK      S00F0_0(3,4,11)->FPC00FE3TQ3(00) OK
FPC01FE0TQ0(00)->S00F0_0(7,0,07) OK      S00F0_0(3,3,11)->FPC01FE0TQ0(00) OK
FPC01FE1TQ1(00)->S00F0_0(7,1,07) OK      S00F0_0(3,1,11)->FPC01FE1TQ1(00) OK
FPC01FE2TQ2(00)->S00F0_0(7,2,07) OK      S00F0_0(3,2,11)->FPC01FE2TQ2(00) Error
FPC01FE3TQ3(00)->S00F0_0(7,3,07) OK      S00F0_0(3,0,11)->FPC01FE3TQ3(00) OK
FPC02FE0TQ0(00)->S00F0_0(6,4,06) OK      S00F0_0(2,7,10)->FPC02FE0TQ0(00) OK
FPC02FE1TQ1(00)->S00F0_0(6,5,06) OK      S00F0_0(2,5,10)->FPC02FE1TQ1(00) OK
FPC02FE2TQ2(00)->S00F0_0(6,6,06) OK      S00F0_0(2,6,10)->FPC02FE2TQ2(00) OK
FPC02FE3TQ3(00)->S00F0_0(6,7,06) OK      S00F0_0(2,4,10)->FPC02FE3TQ3(00) OK
FPC03FE0TQ0(00)->S00F0_0(6,0,06) Down    S00F0_0(2,3,10)->FPC03FE0TQ0(00) Down
FPC03FE1TQ1(00)->S00F0_0(6,1,06) Down    S00F0_0(2,0,10)->FPC03FE1TQ1(00) Down
FPC03FE2TQ2(00)->S00F0_0(6,2,06) Down    S00F0_0(2,2,10)->FPC03FE2TQ2(00) Down
FPC03FE3TQ3(00)->S00F0_0(6,3,06) Down    S00F0_0(2,1,10)->FPC03FE3TQ3(00) Down
FPC04FE0TQ0(00)->S00F0_0(5,4,05) OK      S00F0_0(1,7,09)->FPC04FE0TQ0(00) OK
FPC04FE1TQ1(00)->S00F0_0(5,5,05) OK      S00F0_0(1,6,09)->FPC04FE1TQ1(00) OK
FPC04FE2TQ2(00)->S00F0_0(5,6,05) OK      S00F0_0(1,4,09)->FPC04FE2TQ2(00) OK
FPC04FE3TQ3(00)->S00F0_0(5,7,05) OK      S00F0_0(1,5,09)->FPC04FE3TQ3(00) OK
FPC05FE0TQ0(00)->S00F0_0(5,0,05) OK      S00F0_0(1,3,09)->FPC05FE0TQ0(00) OK
FPC05FE1TQ1(00)->S00F0_0(5,1,05) OK      S00F0_0(1,0,09)->FPC05FE1TQ1(00) OK
FPC05FE2TQ2(00)->S00F0_0(5,2,05) OK      S00F0_0(1,2,09)->FPC05FE2TQ2(00) OK
FPC05FE3TQ3(00)->S00F0_0(5,3,05) OK      S00F0_0(1,1,09)->FPC05FE3TQ3(00) OK
FPC06FE0TQ0(00)->S00F0_0(4,4,04) Down    S00F0_0(0,7,08)->FPC06FE0TQ0(00) Down
FPC06FE1TQ1(00)->S00F0_0(4,5,04) Down    S00F0_0(0,5,08)->FPC06FE1TQ1(00) Down
FPC06FE2TQ2(00)->S00F0_0(4,6,04) Down    S00F0_0(0,6,08)->FPC06FE2TQ2(00) Down
FPC06FE3TQ3(00)->S00F0_0(4,7,04) Down    S00F0_0(0,4,08)->FPC06FE3TQ3(00) Down
FPC07FE0TQ0(00)->S00F0_0(4,2,04) Down    S00F0_0(0,3,08)->FPC07FE0TQ0(00) Down
FPC07FE1TQ1(00)->S00F0_0(4,0,04) Down    S00F0_0(0,0,08)->FPC07FE1TQ1(00) Down
FPC07FE2TQ2(00)->S00F0_0(4,1,04) Down    S00F0_0(0,1,08)->FPC07FE2TQ2(00) Down
FPC07FE3TQ3(00)->S00F0_0(4,3,04) Down    S00F0_0(0,2,08)->FPC07FE3TQ3(00) Down

SIB 0 FCHIP 0 FCORE 1 :
-----------------------
          In-links              State            Out-links              State
--------------------------------------------------------------------------------
FPC00FE0TQ0(01)->S00F0_1(3,4,11) OK      S00F0_1(7,6,07)->FPC00FE0TQ0(01) OK
FPC00FE1TQ1(01)->S00F0_1(3,5,11) OK      S00F0_1(7,4,07)->FPC00FE1TQ1(01) OK
FPC00FE2TQ2(01)->S00F0_1(3,6,11) OK      S00F0_1(7,7,07)->FPC00FE2TQ2(01) OK
FPC00FE3TQ3(01)->S00F0_1(3,7,11) OK      S00F0_1(7,5,07)->FPC00FE3TQ3(01) OK
FPC01FE0TQ0(01)->S00F0_1(3,0,11) OK      S00F0_1(7,2,07)->FPC01FE0TQ0(01) OK
FPC01FE1TQ1(01)->S00F0_1(3,1,11) OK      S00F0_1(7,0,07)->FPC01FE1TQ1(01) OK
FPC01FE2TQ2(01)->S00F0_1(3,2,11) OK      S00F0_1(7,3,07)->FPC01FE2TQ2(01) OK
FPC01FE3TQ3(01)->S00F0_1(3,3,11) OK      S00F0_1(7,1,07)->FPC01FE3TQ3(01) OK
FPC02FE0TQ0(01)->S00F0_1(2,4,10) OK      S00F0_1(6,5,06)->FPC02FE0TQ0(01) OK
FPC02FE1TQ1(01)->S00F0_1(2,5,10) OK      S00F0_1(6,4,06)->FPC02FE1TQ1(01) OK
FPC02FE2TQ2(01)->S00F0_1(2,6,10) OK      S00F0_1(6,7,06)->FPC02FE2TQ2(01) OK
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FPC02FE3TQ3(01)->S00F0_1(2,7,10) OK      S00F0_1(6,6,06)->FPC02FE3TQ3(01) OK
FPC03FE0TQ0(01)->S00F0_1(2,0,10) Down    S00F0_1(6,1,06)->FPC03FE0TQ0(01) Down
FPC03FE1TQ1(01)->S00F0_1(2,1,10) Down    S00F0_1(6,0,06)->FPC03FE1TQ1(01) Down
FPC03FE2TQ2(01)->S00F0_1(2,2,10) Down    S00F0_1(6,3,06)->FPC03FE2TQ2(01) Down
FPC03FE3TQ3(01)->S00F0_1(2,3,10) Down    S00F0_1(6,2,06)->FPC03FE3TQ3(01) Down
FPC04FE0TQ0(01)->S00F0_1(1,4,09) OK      S00F0_1(5,5,05)->FPC04FE0TQ0(01) OK
FPC04FE1TQ1(01)->S00F0_1(1,5,09) OK      S00F0_1(5,4,05)->FPC04FE1TQ1(01) OK
FPC04FE2TQ2(01)->S00F0_1(1,6,09) OK      S00F0_1(5,7,05)->FPC04FE2TQ2(01) OK
FPC04FE3TQ3(01)->S00F0_1(1,7,09) OK      S00F0_1(5,6,05)->FPC04FE3TQ3(01) OK
FPC05FE0TQ0(01)->S00F0_1(1,0,09) OK      S00F0_1(5,1,05)->FPC05FE0TQ0(01) OK
FPC05FE1TQ1(01)->S00F0_1(1,1,09) OK      S00F0_1(5,0,05)->FPC05FE1TQ1(01) OK
FPC05FE2TQ2(01)->S00F0_1(1,2,09) OK      S00F0_1(5,3,05)->FPC05FE2TQ2(01) OK
FPC05FE3TQ3(01)->S00F0_1(1,3,09) OK      S00F0_1(5,2,05)->FPC05FE3TQ3(01) OK
FPC06FE0TQ0(01)->S00F0_1(0,4,08) Down    S00F0_1(4,7,04)->FPC06FE0TQ0(01) Down
FPC06FE1TQ1(01)->S00F0_1(0,5,08) Down    S00F0_1(4,0,04)->FPC06FE1TQ1(01) Down
FPC06FE2TQ2(01)->S00F0_1(0,6,08) Down    S00F0_1(4,6,04)->FPC06FE2TQ2(01) Down
FPC06FE3TQ3(01)->S00F0_1(0,7,08) Down    S00F0_1(4,1,04)->FPC06FE3TQ3(01) Down
FPC07FE0TQ0(01)->S00F0_1(0,0,08) Down    S00F0_1(4,3,04)->FPC07FE0TQ0(01) Down
FPC07FE1TQ1(01)->S00F0_1(0,1,08) Down    S00F0_1(4,4,04)->FPC07FE1TQ1(01) Down
FPC07FE2TQ2(01)->S00F0_1(0,2,08) Down    S00F0_1(4,2,04)->FPC07FE2TQ2(01) Down
FPC07FE3TQ3(01)->S00F0_1(0,3,08) Down    S00F0_1(4,5,04)->FPC07FE3TQ3(01) Down

SIB 1 FCHIP 0 FCORE 0 :
-----------------------
          In-links              State            Out-links              State
--------------------------------------------------------------------------------
FPC00FE0TQ0(02)->S01F0_0(7,4,07) Error   S01F0_0(3,7,11)->FPC00FE0TQ0(02) Down
FPC00FE1TQ1(02)->S01F0_0(7,6,07) OK      S01F0_0(3,5,11)->FPC00FE1TQ1(02) OK
FPC00FE2TQ2(02)->S01F0_0(7,5,07) OK      S01F0_0(3,6,11)->FPC00FE2TQ2(02) OK
FPC00FE3TQ3(02)->S01F0_0(7,7,07) OK      S01F0_0(3,4,11)->FPC00FE3TQ3(02) OK
FPC01FE0TQ0(02)->S01F0_0(7,0,07) OK      S01F0_0(3,3,11)->FPC01FE0TQ0(02) OK
FPC01FE1TQ1(02)->S01F0_0(7,1,07) OK      S01F0_0(3,1,11)->FPC01FE1TQ1(02) OK
FPC01FE2TQ2(02)->S01F0_0(7,2,07) OK      S01F0_0(3,2,11)->FPC01FE2TQ2(02) OK
FPC01FE3TQ3(02)->S01F0_0(7,3,07) OK      S01F0_0(3,0,11)->FPC01FE3TQ3(02) OK
FPC02FE0TQ0(02)->S01F0_0(6,4,06) OK      S01F0_0(2,7,10)->FPC02FE0TQ0(02) OK
FPC02FE1TQ1(02)->S01F0_0(6,5,06) OK      S01F0_0(2,5,10)->FPC02FE1TQ1(02) OK
FPC02FE2TQ2(02)->S01F0_0(6,6,06) OK      S01F0_0(2,6,10)->FPC02FE2TQ2(02) OK
FPC02FE3TQ3(02)->S01F0_0(6,7,06) OK      S01F0_0(2,4,10)->FPC02FE3TQ3(02) OK
FPC03FE0TQ0(02)->S01F0_0(6,0,06) Down    S01F0_0(2,3,10)->FPC03FE0TQ0(02) Down
FPC03FE1TQ1(02)->S01F0_0(6,1,06) Down    S01F0_0(2,0,10)->FPC03FE1TQ1(02) Down
FPC03FE2TQ2(02)->S01F0_0(6,2,06) Down    S01F0_0(2,2,10)->FPC03FE2TQ2(02) Down
FPC03FE3TQ3(02)->S01F0_0(6,3,06) Down    S01F0_0(2,1,10)->FPC03FE3TQ3(02) Down
FPC04FE0TQ0(02)->S01F0_0(5,4,05) OK      S01F0_0(1,7,09)->FPC04FE0TQ0(02) OK
FPC04FE1TQ1(02)->S01F0_0(5,5,05) OK      S01F0_0(1,6,09)->FPC04FE1TQ1(02) OK
FPC04FE2TQ2(02)->S01F0_0(5,6,05) OK      S01F0_0(1,4,09)->FPC04FE2TQ2(02) OK
FPC04FE3TQ3(02)->S01F0_0(5,7,05) OK      S01F0_0(1,5,09)->FPC04FE3TQ3(02) OK
FPC05FE0TQ0(02)->S01F0_0(5,0,05) OK      S01F0_0(1,3,09)->FPC05FE0TQ0(02) OK
FPC05FE1TQ1(02)->S01F0_0(5,1,05) OK      S01F0_0(1,0,09)->FPC05FE1TQ1(02) OK
FPC05FE2TQ2(02)->S01F0_0(5,2,05) OK      S01F0_0(1,2,09)->FPC05FE2TQ2(02) OK
FPC05FE3TQ3(02)->S01F0_0(5,3,05) OK      S01F0_0(1,1,09)->FPC05FE3TQ3(02) OK
FPC06FE0TQ0(02)->S01F0_0(4,4,04) Down    S01F0_0(0,7,08)->FPC06FE0TQ0(02) Down
FPC06FE1TQ1(02)->S01F0_0(4,5,04) Down    S01F0_0(0,5,08)->FPC06FE1TQ1(02) Down
FPC06FE2TQ2(02)->S01F0_0(4,6,04) Down    S01F0_0(0,6,08)->FPC06FE2TQ2(02) Down
FPC06FE3TQ3(02)->S01F0_0(4,7,04) Down    S01F0_0(0,4,08)->FPC06FE3TQ3(02) Down
FPC07FE0TQ0(02)->S01F0_0(4,2,04) Down    S01F0_0(0,3,08)->FPC07FE0TQ0(02) Down
FPC07FE1TQ1(02)->S01F0_0(4,0,04) Down    S01F0_0(0,0,08)->FPC07FE1TQ1(02) Down
FPC07FE2TQ2(02)->S01F0_0(4,1,04) Down    S01F0_0(0,1,08)->FPC07FE2TQ2(02) Down
FPC07FE3TQ3(02)->S01F0_0(4,3,04) Down    S01F0_0(0,2,08)->FPC07FE3TQ3(02) Down

SIB 1 FCHIP 0 FCORE 1 :
-----------------------
```

```
            In-links                 State              Out-links                State
--------------------------------------------------------------------------------------
FPC00FE0TQ0(03)->S01F0_1(3,4,11) OK       S01F0_1(7,6,07)->FPC00FE0TQ0(03)  OK
FPC00FE1TQ1(03)->S01F0_1(3,5,11) OK       S01F0_1(7,4,07)->FPC00FE1TQ1(03)  OK
FPC00FE2TQ2(03)->S01F0_1(3,6,11) OK       S01F0_1(7,7,07)->FPC00FE2TQ2(03)  OK
FPC00FE3TQ3(03)->S01F0_1(3,7,11) OK       S01F0_1(7,5,07)->FPC00FE3TQ3(03)  OK
FPC01FE0TQ0(03)->S01F0_1(3,0,11) OK       S01F0_1(7,2,07)->FPC01FE0TQ0(03)  OK
FPC01FE1TQ1(03)->S01F0_1(3,1,11) OK       S01F0_1(7,0,07)->FPC01FE1TQ1(03)  OK
FPC01FE2TQ2(03)->S01F0_1(3,2,11) OK       S01F0_1(7,3,07)->FPC01FE2TQ2(03)  OK
FPC01FE3TQ3(03)->S01F0_1(3,3,11) OK       S01F0_1(7,1,07)->FPC01FE3TQ3(03)  OK
FPC02FE0TQ0(03)->S01F0_1(2,4,10) OK       S01F0_1(6,5,06)->FPC02FE0TQ0(03)  OK
FPC02FE1TQ1(03)->S01F0_1(2,5,10) OK       S01F0_1(6,4,06)->FPC02FE1TQ1(03)  OK
FPC02FE2TQ2(03)->S01F0_1(2,6,10) OK       S01F0_1(6,7,06)->FPC02FE2TQ2(03)  OK
FPC02FE3TQ3(03)->S01F0_1(2,7,10) OK       S01F0_1(6,6,06)->FPC02FE3TQ3(03)  OK
FPC03FE0TQ0(03)->S01F0_1(2,0,10) Down     S01F0_1(6,1,06)->FPC03FE0TQ0(03)  Down
FPC03FE1TQ1(03)->S01F0_1(2,1,10) Down     S01F0_1(6,0,06)->FPC03FE1TQ1(03)  Down
FPC03FE2TQ2(03)->S01F0_1(2,2,10) Down     S01F0_1(6,3,06)->FPC03FE2TQ2(03)  Down
FPC03FE3TQ3(03)->S01F0_1(2,3,10) Down     S01F0_1(6,2,06)->FPC03FE3TQ3(03)  Down
FPC04FE0TQ0(03)->S01F0_1(1,4,09) OK       S01F0_1(5,5,05)->FPC04FE0TQ0(03)  OK
FPC04FE1TQ1(03)->S01F0_1(1,5,09) OK       S01F0_1(5,4,05)->FPC04FE1TQ1(03)  OK
FPC04FE2TQ2(03)->S01F0_1(1,6,09) OK       S01F0_1(5,7,05)->FPC04FE2TQ2(03)  OK
FPC04FE3TQ3(03)->S01F0_1(1,7,09) OK       S01F0_1(5,6,05)->FPC04FE3TQ3(03)  OK
FPC05FE0TQ0(03)->S01F0_1(1,0,09) OK       S01F0_1(5,1,05)->FPC05FE0TQ0(03)  OK
FPC05FE1TQ1(03)->S01F0_1(1,1,09) OK       S01F0_1(5,0,05)->FPC05FE1TQ1(03)  OK
FPC05FE2TQ2(03)->S01F0_1(1,2,09) OK       S01F0_1(5,3,05)->FPC05FE2TQ2(03)  OK
FPC05FE3TQ3(03)->S01F0_1(1,3,09) OK       S01F0_1(5,2,05)->FPC05FE3TQ3(03)  OK
FPC06FE0TQ0(03)->S01F0_1(0,4,08) Down     S01F0_1(4,7,04)->FPC06FE0TQ0(03)  Down
FPC06FE1TQ1(03)->S01F0_1(0,5,08) Down     S01F0_1(4,0,04)->FPC06FE1TQ1(03)  Down
FPC06FE2TQ2(03)->S01F0_1(0,6,08) Down     S01F0_1(4,6,04)->FPC06FE2TQ2(03)  Down
FPC06FE3TQ3(03)->S01F0_1(0,7,08) Down     S01F0_1(4,1,04)->FPC06FE3TQ3(03)  Down
FPC07FE0TQ0(03)->S01F0_1(0,0,08) Down     S01F0_1(4,3,04)->FPC07FE0TQ0(03)  Down
FPC07FE1TQ1(03)->S01F0_1(0,1,08) Down     S01F0_1(4,4,04)->FPC07FE1TQ1(03)  Down
FPC07FE2TQ2(03)->S01F0_1(0,2,08) Down     S01F0_1(4,2,04)->FPC07FE2TQ2(03)  Down
FPC07FE3TQ3(03)->S01F0_1(0,3,08) Down     S01F0_1(4,5,04)->FPC07FE3TQ3(03)  Down
```

show chassis fabric topology (PTX3000 Router)

```
user@host> show chassis fabric topology
 In-link  : FPC# FE# TQ# (TQ-TX sub-chnl #) ->
            SIB# TF#_FCORE# (TF-RX port#, TF-RX sub-chn#, TF-RX inst#)

 Out-link : SIB# TF#_FCORE# (TF-TX port#, TF-TX sub-chn#, TF-TX inst#) ->
            FPC# FE# TQ# (TQ-RX sub-chnl #)
SIB 0 FCHIP 0 FCORE 0 :
-----------------------
            In-links                 State              Out-links                State
--------------------------------------------------------------------------------------
FPC00FE0TQ0(00)->S00F0_0(7,0,07) Down     S00F0_0(3,0,11)->FPC00FE0TQ0(00)  Down
FPC00FE1TQ1(00)->S00F0_0(7,1,07) Down     S00F0_0(3,1,11)->FPC00FE1TQ1(00)  Down
FPC02FE0TQ0(00)->S00F0_0(6,0,06) Down     S00F0_0(2,0,10)->FPC02FE0TQ0(00)  Down
FPC02FE1TQ1(00)->S00F0_0(6,1,06) Down     S00F0_0(2,1,10)->FPC02FE1TQ1(00)  Down
FPC04FE0TQ0(00)->S00F0_0(5,0,05) Down     S00F0_0(1,0,09)->FPC04FE0TQ0(00)  Down
FPC04FE1TQ1(00)->S00F0_0(5,1,05) Down     S00F0_0(1,1,09)->FPC04FE1TQ1(00)  Down
FPC06FE0TQ0(00)->S00F0_0(4,0,04) Down     S00F0_0(0,0,08)->FPC06FE0TQ0(00)  Down
FPC06FE1TQ1(00)->S00F0_0(4,1,04) Down     S00F0_0(0,1,08)->FPC06FE1TQ1(00)  Down
FPC08FE0TQ0(00)->S00F0_0(4,2,04) OK       S00F0_0(0,2,08)->FPC08FE0TQ0(00)  OK
FPC08FE1TQ1(00)->S00F0_0(4,3,04) OK       S00F0_0(0,3,08)->FPC08FE1TQ1(00)  OK
FPC10FE0TQ0(00)->S00F0_0(5,2,05) Down     S00F0_0(1,2,09)->FPC10FE0TQ0(00)  Down
FPC10FE1TQ1(00)->S00F0_0(5,3,05) Down     S00F0_0(1,3,09)->FPC10FE1TQ1(00)  Down
FPC12FE0TQ0(00)->S00F0_0(7,2,07) OK       S00F0_0(3,2,11)->FPC12FE0TQ0(00)  OK
FPC12FE1TQ1(00)->S00F0_0(7,3,07) OK       S00F0_0(3,3,11)->FPC12FE1TQ1(00)  OK
```



```
FPC14FE0TQ0(00)->S00F0_0(7,4,07) Down    S00F0_0(3,4,11)->FPC14FE0TQ0(00) Down
FPC14FE1TQ1(00)->S00F0_0(7,5,07) Down    S00F0_0(3,5,11)->FPC14FE1TQ1(00) Down

SIB 0 FCHIP 0 FCORE 1 :
-----------------------
          In-links              State             Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(01)->S00F0_1(3,0,11) Down    S00F0_1(7,0,07)->FPC00FE0TQ0(01) Down
FPC00FE1TQ1(01)->S00F0_1(3,1,11) Down    S00F0_1(7,1,07)->FPC00FE1TQ1(01) Down
FPC02FE0TQ0(01)->S00F0_1(2,0,10) Down    S00F0_1(6,0,06)->FPC02FE0TQ0(01) Down
FPC02FE1TQ1(01)->S00F0_1(2,1,10) Down    S00F0_1(6,1,06)->FPC02FE1TQ1(01) Down
FPC04FE0TQ0(01)->S00F0_1(1,0,09) Down    S00F0_1(4,0,04)->FPC04FE0TQ0(01) Down
FPC04FE1TQ1(01)->S00F0_1(1,1,09) Down    S00F0_1(4,1,04)->FPC04FE1TQ1(01) Down
FPC06FE0TQ0(01)->S00F0_1(0,0,08) Down    S00F0_1(4,2,04)->FPC06FE0TQ0(01) Down
FPC06FE1TQ1(01)->S00F0_1(0,1,08) Down    S00F0_1(4,3,04)->FPC06FE1TQ1(01) Down
FPC08FE0TQ0(01)->S00F0_1(0,2,08) OK      S00F0_1(4,4,04)->FPC08FE0TQ0(01) OK
FPC08FE1TQ1(01)->S00F0_1(0,3,08) OK      S00F0_1(4,5,04)->FPC08FE1TQ1(01) OK
FPC10FE0TQ0(01)->S00F0_1(1,2,09) Down    S00F0_1(5,0,05)->FPC10FE0TQ0(01) Down
FPC10FE1TQ1(01)->S00F0_1(1,3,09) Down    S00F0_1(5,1,05)->FPC10FE1TQ1(01) Down
FPC12FE0TQ0(01)->S00F0_1(2,2,10) OK      S00F0_1(6,2,06)->FPC12FE0TQ0(01) OK
FPC12FE1TQ1(01)->S00F0_1(2,3,10) OK      S00F0_1(6,3,06)->FPC12FE1TQ1(01) OK
FPC14FE0TQ0(01)->S00F0_1(3,2,11) Down    S00F0_1(7,2,07)->FPC14FE0TQ0(01) Down
FPC14FE1TQ1(01)->S00F0_1(3,3,11) Down    S00F0_1(7,3,07)->FPC14FE1TQ1(01) Down

SIB 1 FCHIP 0 FCORE 0 :
-----------------------
          In-links              State             Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(02)->S01F0_0(7,0,07) Down    S01F0_0(3,0,11)->FPC00FE0TQ0(02) Down
FPC00FE1TQ1(02)->S01F0_0(7,1,07) Down    S01F0_0(3,1,11)->FPC00FE1TQ1(02) Down
FPC02FE0TQ0(02)->S01F0_0(6,0,06) Down    S01F0_0(2,0,10)->FPC02FE0TQ0(02) Down
FPC02FE1TQ1(02)->S01F0_0(6,1,06) Down    S01F0_0(2,1,10)->FPC02FE1TQ1(02) Down
---(more)---[abort]

user@host> show chassis fabric topology | no-more

 In-link  : FPC# FE# TQ# (TQ-TX sub-chnl #) ->
            SIB# TF#_FCORE# (TF-RX port#, TF-RX sub-chn#, TF-RX inst#)

 Out-link : SIB# TF#_FCORE# (TF-TX port#, TF-TX sub-chn#, TF-TX inst#) ->
            FPC# FE# TQ# (TQ-RX sub-chnl #)
SIB 0 FCHIP 0 FCORE 0 :
-----------------------
          In-links              State             Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(00)->S00F0_0(7,0,07) Down    S00F0_0(3,0,11)->FPC00FE0TQ0(00) Down
FPC00FE1TQ1(00)->S00F0_0(7,1,07) Down    S00F0_0(3,1,11)->FPC00FE1TQ1(00) Down
FPC02FE0TQ0(00)->S00F0_0(6,0,06) Down    S00F0_0(2,0,10)->FPC02FE0TQ0(00) Down
FPC02FE1TQ1(00)->S00F0_0(6,1,06) Down    S00F0_0(2,1,10)->FPC02FE1TQ1(00) Down
FPC04FE0TQ0(00)->S00F0_0(5,0,05) Down    S00F0_0(1,0,09)->FPC04FE0TQ0(00) Down
FPC04FE1TQ1(00)->S00F0_0(5,1,05) Down    S00F0_0(1,1,09)->FPC04FE1TQ1(00) Down
FPC06FE0TQ0(00)->S00F0_0(4,0,04) Down    S00F0_0(0,0,08)->FPC06FE0TQ0(00) Down
FPC06FE1TQ1(00)->S00F0_0(4,1,04) Down    S00F0_0(0,1,08)->FPC06FE1TQ1(00) Down
FPC08FE0TQ0(00)->S00F0_0(4,2,04) OK      S00F0_0(0,2,08)->FPC08FE0TQ0(00) OK
FPC08FE1TQ1(00)->S00F0_0(4,3,04) OK      S00F0_0(0,3,08)->FPC08FE1TQ1(00) OK
FPC10FE0TQ0(00)->S00F0_0(5,2,05) Down    S00F0_0(1,2,09)->FPC10FE0TQ0(00) Down
FPC10FE1TQ1(00)->S00F0_0(5,3,05) Down    S00F0_0(1,3,09)->FPC10FE1TQ1(00) Down
FPC12FE0TQ0(00)->S00F0_0(7,2,07) OK      S00F0_0(3,2,11)->FPC12FE0TQ0(00) OK
FPC12FE1TQ1(00)->S00F0_0(7,3,07) OK      S00F0_0(3,3,11)->FPC12FE1TQ1(00) OK
FPC14FE0TQ0(00)->S00F0_0(7,4,07) Down    S00F0_0(3,4,11)->FPC14FE0TQ0(00) Down
FPC14FE1TQ1(00)->S00F0_0(7,5,07) Down    S00F0_0(3,5,11)->FPC14FE1TQ1(00) Down
```

```
SIB 0 FCHIP 0 FCORE 1 :
-----------------------
          In-links              State            Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(01)->S00F0_1(3,0,11) Down    S00F0_1(7,0,07)->FPC00FE0TQ0(01) Down
FPC00FE1TQ1(01)->S00F0_1(3,1,11) Down    S00F0_1(7,1,07)->FPC00FE1TQ1(01) Down
FPC02FE0TQ0(01)->S00F0_1(2,0,10) Down    S00F0_1(6,0,06)->FPC02FE0TQ0(01) Down
FPC02FE1TQ1(01)->S00F0_1(2,1,10) Down    S00F0_1(6,1,06)->FPC02FE1TQ1(01) Down
FPC04FE0TQ0(01)->S00F0_1(1,0,09) Down    S00F0_1(4,0,04)->FPC04FE0TQ0(01) Down
FPC04FE1TQ1(01)->S00F0_1(1,1,09) Down    S00F0_1(4,1,04)->FPC04FE1TQ1(01) Down
FPC06FE0TQ0(01)->S00F0_1(0,0,08) Down    S00F0_1(4,2,04)->FPC06FE0TQ0(01) Down
FPC06FE1TQ1(01)->S00F0_1(0,1,08) Down    S00F0_1(4,3,04)->FPC06FE1TQ1(01) Down
FPC08FE0TQ0(01)->S00F0_1(0,2,08) OK      S00F0_1(4,4,04)->FPC08FE0TQ0(01) OK
FPC08FE1TQ1(01)->S00F0_1(0,3,08) OK      S00F0_1(4,5,04)->FPC08FE1TQ1(01) OK
FPC10FE0TQ0(01)->S00F0_1(1,2,09) Down    S00F0_1(5,0,05)->FPC10FE0TQ0(01) Down
FPC10FE1TQ1(01)->S00F0_1(1,3,09) Down    S00F0_1(5,1,05)->FPC10FE1TQ1(01) Down
FPC12FE0TQ0(01)->S00F0_1(2,2,10) OK      S00F0_1(6,2,06)->FPC12FE0TQ0(01) OK
FPC12FE1TQ1(01)->S00F0_1(2,3,10) OK      S00F0_1(6,3,06)->FPC12FE1TQ1(01) OK
FPC14FE0TQ0(01)->S00F0_1(3,2,11) Down    S00F0_1(7,2,07)->FPC14FE0TQ0(01) Down
FPC14FE1TQ1(01)->S00F0_1(3,3,11) Down    S00F0_1(7,3,07)->FPC14FE1TQ1(01) Down

SIB 1 FCHIP 0 FCORE 0 :
-----------------------
          In-links              State            Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(02)->S01F0_0(7,0,07) Down    S01F0_0(3,0,11)->FPC00FE0TQ0(02) Down
FPC00FE1TQ1(02)->S01F0_0(7,1,07) Down    S01F0_0(3,1,11)->FPC00FE1TQ1(02) Down
FPC02FE0TQ0(02)->S01F0_0(6,0,06) Down    S01F0_0(2,0,10)->FPC02FE0TQ0(02) Down
FPC02FE1TQ1(02)->S01F0_0(6,1,06) Down    S01F0_0(2,1,10)->FPC02FE1TQ1(02) Down
FPC04FE0TQ0(02)->S01F0_0(5,0,05) Down    S01F0_0(1,0,09)->FPC04FE0TQ0(02) Down
FPC04FE1TQ1(02)->S01F0_0(5,1,05) Down    S01F0_0(1,1,09)->FPC04FE1TQ1(02) Down
FPC06FE0TQ0(02)->S01F0_0(4,0,04) Down    S01F0_0(0,0,08)->FPC06FE0TQ0(02) Down
FPC06FE1TQ1(02)->S01F0_0(4,1,04) Down    S01F0_0(0,1,08)->FPC06FE1TQ1(02) Down
FPC08FE0TQ0(02)->S01F0_0(4,2,04) OK      S01F0_0(0,2,08)->FPC08FE0TQ0(02) OK
FPC08FE1TQ1(02)->S01F0_0(4,3,04) OK      S01F0_0(0,3,08)->FPC08FE1TQ1(02) OK
FPC10FE0TQ0(02)->S01F0_0(5,2,05) Down    S01F0_0(1,2,09)->FPC10FE0TQ0(02) Down
FPC10FE1TQ1(02)->S01F0_0(5,3,05) Down    S01F0_0(1,3,09)->FPC10FE1TQ1(02) Down
FPC12FE0TQ0(02)->S01F0_0(7,2,07) OK      S01F0_0(3,2,11)->FPC12FE0TQ0(02) OK
FPC12FE1TQ1(02)->S01F0_0(7,3,07) OK      S01F0_0(3,3,11)->FPC12FE1TQ1(02) OK
FPC14FE0TQ0(02)->S01F0_0(7,4,07) Down    S01F0_0(3,4,11)->FPC14FE0TQ0(02) Down
FPC14FE1TQ1(02)->S01F0_0(7,5,07) Down    S01F0_0(3,5,11)->FPC14FE1TQ1(02) Down

SIB 1 FCHIP 0 FCORE 1 :
-----------------------
          In-links              State            Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(03)->S01F0_1(3,0,11) Down    S01F0_1(7,0,07)->FPC00FE0TQ0(03) Down
FPC00FE1TQ1(03)->S01F0_1(3,1,11) Down    S01F0_1(7,1,07)->FPC00FE1TQ1(03) Down
FPC02FE0TQ0(03)->S01F0_1(2,0,10) Down    S01F0_1(6,0,06)->FPC02FE0TQ0(03) Down
FPC02FE1TQ1(03)->S01F0_1(2,1,10) Down    S01F0_1(6,1,06)->FPC02FE1TQ1(03) Down
FPC04FE0TQ0(03)->S01F0_1(1,0,09) Down    S01F0_1(4,0,04)->FPC04FE0TQ0(03) Down
FPC04FE1TQ1(03)->S01F0_1(1,1,09) Down    S01F0_1(4,1,04)->FPC04FE1TQ1(03) Down
FPC06FE0TQ0(03)->S01F0_1(0,0,08) Down    S01F0_1(4,2,04)->FPC06FE0TQ0(03) Down
FPC06FE1TQ1(03)->S01F0_1(0,1,08) Down    S01F0_1(4,3,04)->FPC06FE1TQ1(03) Down
FPC08FE0TQ0(03)->S01F0_1(0,2,08) OK      S01F0_1(4,4,04)->FPC08FE0TQ0(03) OK
FPC08FE1TQ1(03)->S01F0_1(0,3,08) OK      S01F0_1(4,5,04)->FPC08FE1TQ1(03) OK
FPC10FE0TQ0(03)->S01F0_1(1,2,09) Down    S01F0_1(5,0,05)->FPC10FE0TQ0(03) Down
FPC10FE1TQ1(03)->S01F0_1(1,3,09) Down    S01F0_1(5,1,05)->FPC10FE1TQ1(03) Down
FPC12FE0TQ0(03)->S01F0_1(2,2,10) OK      S01F0_1(6,2,06)->FPC12FE0TQ0(03) OK
FPC12FE1TQ1(03)->S01F0_1(2,3,10) OK      S01F0_1(6,3,06)->FPC12FE1TQ1(03) OK
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FPC14FE0TQ0(03)->S01F0_1(3,2,11) Down    S01F0_1(7,2,07)->FPC14FE0TQ0(03) Down
FPC14FE1TQ1(03)->S01F0_1(3,3,11) Down    S01F0_1(7,3,07)->FPC14FE1TQ1(03) Down

SIB 2 FCHIP 0 FCORE 0 :
-----------------------
          In-links             State            Out-links            State
--------------------------------------------------------------------------------
FPC00FE0TQ0(04)->S02F0_0(7,0,07) Down    S02F0_0(3,0,11)->FPC00FE0TQ0(04) Down
FPC00FE1TQ1(04)->S02F0_0(7,1,07) Down    S02F0_0(3,1,11)->FPC00FE1TQ1(04) Down
FPC02FE0TQ0(04)->S02F0_0(6,0,06) Down    S02F0_0(2,0,10)->FPC02FE0TQ0(04) Down
FPC02FE1TQ1(04)->S02F0_0(6,1,06) Down    S02F0_0(2,1,10)->FPC02FE1TQ1(04) Down
FPC04FE0TQ0(04)->S02F0_0(5,0,05) Down    S02F0_0(1,0,09)->FPC04FE0TQ0(04) Down
FPC04FE1TQ1(04)->S02F0_0(5,1,05) Down    S02F0_0(1,1,09)->FPC04FE1TQ1(04) Down
FPC06FE0TQ0(04)->S02F0_0(4,0,04) Down    S02F0_0(0,0,08)->FPC06FE0TQ0(04) Down
FPC06FE1TQ1(04)->S02F0_0(4,1,04) Down    S02F0_0(0,1,08)->FPC06FE1TQ1(04) Down
FPC08FE0TQ0(04)->S02F0_0(4,2,04) OK      S02F0_0(0,2,08)->FPC08FE0TQ0(04) OK
FPC08FE1TQ1(04)->S02F0_0(4,3,04) OK      S02F0_0(0,3,08)->FPC08FE1TQ1(04) OK
FPC10FE0TQ0(04)->S02F0_0(5,2,05) Down    S02F0_0(1,2,09)->FPC10FE0TQ0(04) Down
FPC10FE1TQ1(04)->S02F0_0(5,3,05) Down    S02F0_0(1,3,09)->FPC10FE1TQ1(04) Down
FPC12FE0TQ0(04)->S02F0_0(7,2,07) OK      S02F0_0(3,2,11)->FPC12FE0TQ0(04) OK
FPC12FE1TQ1(04)->S02F0_0(7,3,07) OK      S02F0_0(3,3,11)->FPC12FE1TQ1(04) OK
FPC14FE0TQ0(04)->S02F0_0(7,4,07) Down    S02F0_0(3,4,11)->FPC14FE0TQ0(04) Down
FPC14FE1TQ1(04)->S02F0_0(7,5,07) Down    S02F0_0(3,5,11)->FPC14FE1TQ1(04) Down

SIB 2 FCHIP 0 FCORE 1 :
-----------------------
          In-links             State            Out-links            State
--------------------------------------------------------------------------------
FPC00FE0TQ0(05)->S02F0_1(3,0,11) Down    S02F0_1(7,0,07)->FPC00FE0TQ0(05) Down
FPC00FE1TQ1(05)->S02F0_1(3,1,11) Down    S02F0_1(7,1,07)->FPC00FE1TQ1(05) Down
FPC02FE0TQ0(05)->S02F0_1(2,0,10) Down    S02F0_1(6,0,06)->FPC02FE0TQ0(05) Down
FPC02FE1TQ1(05)->S02F0_1(2,1,10) Down    S02F0_1(6,1,06)->FPC02FE1TQ1(05) Down
FPC04FE0TQ0(05)->S02F0_1(1,0,09) Down    S02F0_1(4,0,04)->FPC04FE0TQ0(05) Down
FPC04FE1TQ1(05)->S02F0_1(1,1,09) Down    S02F0_1(4,1,04)->FPC04FE1TQ1(05) Down
FPC06FE0TQ0(05)->S02F0_1(0,0,08) Down    S02F0_1(4,2,04)->FPC06FE0TQ0(05) Down
FPC06FE1TQ1(05)->S02F0_1(0,1,08) Down    S02F0_1(4,3,04)->FPC06FE1TQ1(05) Down
FPC08FE0TQ0(05)->S02F0_1(0,2,08) OK      S02F0_1(4,4,04)->FPC08FE0TQ0(05) OK
FPC08FE1TQ1(05)->S02F0_1(0,3,08) OK      S02F0_1(4,5,04)->FPC08FE1TQ1(05) OK
FPC10FE0TQ0(05)->S02F0_1(1,2,09) Down    S02F0_1(5,0,05)->FPC10FE0TQ0(05) Down
FPC10FE1TQ1(05)->S02F0_1(1,3,09) Down    S02F0_1(5,1,05)->FPC10FE1TQ1(05) Down
FPC12FE0TQ0(05)->S02F0_1(2,2,10) OK      S02F0_1(6,2,06)->FPC12FE0TQ0(05) OK
FPC12FE1TQ1(05)->S02F0_1(2,3,10) OK      S02F0_1(6,3,06)->FPC12FE1TQ1(05) OK
FPC14FE0TQ0(05)->S02F0_1(3,2,11) Down    S02F0_1(7,2,07)->FPC14FE0TQ0(05) Down
FPC14FE1TQ1(05)->S02F0_1(3,3,11) Down    S02F0_1(7,3,07)->FPC14FE1TQ1(05) Down

SIB 3 FCHIP 0 FCORE 0 :
-----------------------
          In-links             State            Out-links            State
--------------------------------------------------------------------------------
FPC00FE0TQ0(06)->S03F0_0(7,0,07) Down    S03F0_0(3,0,11)->FPC00FE0TQ0(06) Down
FPC00FE1TQ1(06)->S03F0_0(7,1,07) Down    S03F0_0(3,1,11)->FPC00FE1TQ1(06) Down
FPC02FE0TQ0(06)->S03F0_0(6,0,06) Down    S03F0_0(2,0,10)->FPC02FE0TQ0(06) Down
FPC02FE1TQ1(06)->S03F0_0(6,1,06) Down    S03F0_0(2,1,10)->FPC02FE1TQ1(06) Down
FPC04FE0TQ0(06)->S03F0_0(5,0,05) Down    S03F0_0(1,0,09)->FPC04FE0TQ0(06) Down
FPC04FE1TQ1(06)->S03F0_0(5,1,05) Down    S03F0_0(1,1,09)->FPC04FE1TQ1(06) Down
FPC06FE0TQ0(06)->S03F0_0(4,0,04) Down    S03F0_0(0,0,08)->FPC06FE0TQ0(06) Down
FPC06FE1TQ1(06)->S03F0_0(4,1,04) Down    S03F0_0(0,1,08)->FPC06FE1TQ1(06) Down
FPC08FE0TQ0(06)->S03F0_0(4,2,04) OK      S03F0_0(0,2,08)->FPC08FE0TQ0(06) OK
FPC08FE1TQ1(06)->S03F0_0(4,3,04) OK      S03F0_0(0,3,08)->FPC08FE1TQ1(06) OK
FPC10FE0TQ0(06)->S03F0_0(5,2,05) Down    S03F0_0(1,2,09)->FPC10FE0TQ0(06) Down
FPC10FE1TQ1(06)->S03F0_0(5,3,05) Down    S03F0_0(1,3,09)->FPC10FE1TQ1(06) Down
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FPC12FE0TQ0(06)->S03F0_0(7,2,07) OK      S03F0_0(3,2,11)->FPC12FE0TQ0(06) OK
FPC12FE1TQ1(06)->S03F0_0(7,3,07) OK      S03F0_0(3,3,11)->FPC12FE1TQ1(06) OK
FPC14FE0TQ0(06)->S03F0_0(7,4,07) Down    S03F0_0(3,4,11)->FPC14FE0TQ0(06) Down
FPC14FE1TQ1(06)->S03F0_0(7,5,07) Down    S03F0_0(3,5,11)->FPC14FE1TQ1(06) Down

SIB 3 FCHIP 0 FCORE 1 :
-----------------------
          In-links              State            Out-links              State
--------------------------------------------------------------------------------
FPC00FE0TQ0(07)->S03F0_1(3,0,11) Down    S03F0_1(7,0,07)->FPC00FE0TQ0(07) Down
FPC00FE1TQ1(07)->S03F0_1(3,1,11) Down    S03F0_1(7,1,07)->FPC00FE1TQ1(07) Down
FPC02FE0TQ0(07)->S03F0_1(2,0,10) Down    S03F0_1(6,0,06)->FPC02FE0TQ0(07) Down
FPC02FE1TQ1(07)->S03F0_1(2,1,10) Down    S03F0_1(6,1,06)->FPC02FE1TQ1(07) Down
FPC04FE0TQ0(07)->S03F0_1(1,0,09) Down    S03F0_1(4,0,04)->FPC04FE0TQ0(07) Down
FPC04FE1TQ1(07)->S03F0_1(1,1,09) Down    S03F0_1(4,1,04)->FPC04FE1TQ1(07) Down
FPC06FE0TQ0(07)->S03F0_1(0,0,08) Down    S03F0_1(4,2,04)->FPC06FE0TQ0(07) Down
FPC06FE1TQ1(07)->S03F0_1(0,1,08) Down    S03F0_1(4,3,04)->FPC06FE1TQ1(07) Down
FPC08FE0TQ0(07)->S03F0_1(0,2,08) OK      S03F0_1(4,4,04)->FPC08FE0TQ0(07) OK
FPC08FE1TQ1(07)->S03F0_1(0,3,08) OK      S03F0_1(4,5,04)->FPC08FE1TQ1(07) OK
FPC10FE0TQ0(07)->S03F0_1(1,2,09) Down    S03F0_1(5,0,05)->FPC10FE0TQ0(07) Down
FPC10FE1TQ1(07)->S03F0_1(1,3,09) Down    S03F0_1(5,1,05)->FPC10FE1TQ1(07) Down
FPC12FE0TQ0(07)->S03F0_1(2,2,10) OK      S03F0_1(6,2,06)->FPC12FE0TQ0(07) OK
FPC12FE1TQ1(07)->S03F0_1(2,3,10) OK      S03F0_1(6,3,06)->FPC12FE1TQ1(07) OK
FPC14FE0TQ0(07)->S03F0_1(3,2,11) Down    S03F0_1(7,2,07)->FPC14FE0TQ0(07) Down
FPC14FE1TQ1(07)->S03F0_1(3,3,11) Down    S03F0_1(7,3,07)->FPC14FE1TQ1(07) Down

SIB 4 FCHIP 0 FCORE 0 :
-----------------------
          In-links              State            Out-links              State
--------------------------------------------------------------------------------
FPC00FE0TQ0(08)->S04F0_0(7,0,07) Down    S04F0_0(3,0,11)->FPC00FE0TQ0(08) Down
FPC00FE1TQ1(08)->S04F0_0(7,1,07) Down    S04F0_0(3,1,11)->FPC00FE1TQ1(08) Down
FPC02FE0TQ0(08)->S04F0_0(6,0,06) Down    S04F0_0(2,0,10)->FPC02FE0TQ0(08) Down
FPC02FE1TQ1(08)->S04F0_0(6,1,06) Down    S04F0_0(2,1,10)->FPC02FE1TQ1(08) Down
FPC04FE0TQ0(08)->S04F0_0(5,0,05) Down    S04F0_0(1,0,09)->FPC04FE0TQ0(08) Down
FPC04FE1TQ1(08)->S04F0_0(5,1,05) Down    S04F0_0(1,1,09)->FPC04FE1TQ1(08) Down
FPC06FE0TQ0(08)->S04F0_0(4,0,04) Down    S04F0_0(0,0,08)->FPC06FE0TQ0(08) Down
FPC06FE1TQ1(08)->S04F0_0(4,1,04) Down    S04F0_0(0,1,08)->FPC06FE1TQ1(08) Down
FPC08FE0TQ0(08)->S04F0_0(4,2,04) OK      S04F0_0(0,2,08)->FPC08FE0TQ0(08) OK
FPC08FE1TQ1(08)->S04F0_0(4,3,04) OK      S04F0_0(0,3,08)->FPC08FE1TQ1(08) OK
FPC10FE0TQ0(08)->S04F0_0(5,2,05) Down    S04F0_0(1,2,09)->FPC10FE0TQ0(08) Down
FPC10FE1TQ1(08)->S04F0_0(5,3,05) Down    S04F0_0(1,3,09)->FPC10FE1TQ1(08) Down
FPC12FE0TQ0(08)->S04F0_0(7,2,07) OK      S04F0_0(3,2,11)->FPC12FE0TQ0(08) OK
FPC12FE1TQ1(08)->S04F0_0(7,3,07) OK      S04F0_0(3,3,11)->FPC12FE1TQ1(08) OK
FPC14FE0TQ0(08)->S04F0_0(7,4,07) Down    S04F0_0(3,4,11)->FPC14FE0TQ0(08) Down
FPC14FE1TQ1(08)->S04F0_0(7,5,07) Down    S04F0_0(3,5,11)->FPC14FE1TQ1(08) Down

SIB 4 FCHIP 0 FCORE 1 :
-----------------------
          In-links              State            Out-links              State
--------------------------------------------------------------------------------
FPC00FE0TQ0(09)->S04F0_1(3,0,11) Down    S04F0_1(7,0,07)->FPC00FE0TQ0(09) Down
FPC00FE1TQ1(09)->S04F0_1(3,1,11) Down    S04F0_1(7,1,07)->FPC00FE1TQ1(09) Down
FPC02FE0TQ0(09)->S04F0_1(2,0,10) Down    S04F0_1(6,0,06)->FPC02FE0TQ0(09) Down
FPC02FE1TQ1(09)->S04F0_1(2,1,10) Down    S04F0_1(6,1,06)->FPC02FE1TQ1(09) Down
FPC04FE0TQ0(09)->S04F0_1(1,0,09) Down    S04F0_1(4,0,04)->FPC04FE0TQ0(09) Down
FPC04FE1TQ1(09)->S04F0_1(1,1,09) Down    S04F0_1(4,1,04)->FPC04FE1TQ1(09) Down
FPC06FE0TQ0(09)->S04F0_1(0,0,08) Down    S04F0_1(4,2,04)->FPC06FE0TQ0(09) Down
FPC06FE1TQ1(09)->S04F0_1(0,1,08) Down    S04F0_1(4,3,04)->FPC06FE1TQ1(09) Down
FPC08FE0TQ0(09)->S04F0_1(0,2,08) OK      S04F0_1(4,4,04)->FPC08FE0TQ0(09) OK
FPC08FE1TQ1(09)->S04F0_1(0,3,08) OK      S04F0_1(4,5,04)->FPC08FE1TQ1(09) OK
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FPC10FE0TQ0(09)->S04F0_1(1,2,09) Down    S04F0_1(5,0,05)->FPC10FE0TQ0(09) Down
FPC10FE1TQ1(09)->S04F0_1(1,3,09) Down    S04F0_1(5,1,05)->FPC10FE1TQ1(09) Down
FPC12FE0TQ0(09)->S04F0_1(2,2,10) OK      S04F0_1(6,2,06)->FPC12FE0TQ0(09) OK
FPC12FE1TQ1(09)->S04F0_1(2,3,10) OK      S04F0_1(6,3,06)->FPC12FE1TQ1(09) OK
FPC14FE0TQ0(09)->S04F0_1(3,2,11) Down    S04F0_1(7,2,07)->FPC14FE0TQ0(09) Down
FPC14FE1TQ1(09)->S04F0_1(3,3,11) Down    S04F0_1(7,3,07)->FPC14FE1TQ1(09) Down

SIB 5 FCHIP 0 FCORE 0 :
-----------------------
         In-links              State            Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(10)->S05F0_0(7,0,07) Down    S05F0_0(3,0,11)->FPC00FE0TQ0(10) Down
FPC00FE1TQ1(10)->S05F0_0(7,1,07) Down    S05F0_0(3,1,11)->FPC00FE1TQ1(10) Down
FPC02FE0TQ0(10)->S05F0_0(6,0,06) Down    S05F0_0(2,0,10)->FPC02FE0TQ0(10) Down
FPC02FE1TQ1(10)->S05F0_0(6,1,06) Down    S05F0_0(2,1,10)->FPC02FE1TQ1(10) Down
FPC04FE0TQ0(10)->S05F0_0(5,0,05) Down    S05F0_0(1,0,09)->FPC04FE0TQ0(10) Down
FPC04FE1TQ1(10)->S05F0_0(5,1,05) Down    S05F0_0(1,1,09)->FPC04FE1TQ1(10) Down
FPC06FE0TQ0(10)->S05F0_0(4,0,04) Down    S05F0_0(0,0,08)->FPC06FE0TQ0(10) Down
FPC06FE1TQ1(10)->S05F0_0(4,1,04) Down    S05F0_0(0,1,08)->FPC06FE1TQ1(10) Down
FPC08FE0TQ0(10)->S05F0_0(4,2,04) OK      S05F0_0(0,2,08)->FPC08FE0TQ0(10) OK
FPC08FE1TQ1(10)->S05F0_0(4,3,04) OK      S05F0_0(0,3,08)->FPC08FE1TQ1(10) OK
FPC10FE0TQ0(10)->S05F0_0(5,2,05) Down    S05F0_0(1,2,09)->FPC10FE0TQ0(10) Down
FPC10FE1TQ1(10)->S05F0_0(5,3,05) Down    S05F0_0(1,3,09)->FPC10FE1TQ1(10) Down
FPC12FE0TQ0(10)->S05F0_0(7,2,07) OK      S05F0_0(3,2,11)->FPC12FE0TQ0(10) OK
FPC12FE1TQ1(10)->S05F0_0(7,3,07) OK      S05F0_0(3,3,11)->FPC12FE1TQ1(10) OK
FPC14FE0TQ0(10)->S05F0_0(7,4,07) Down    S05F0_0(3,4,11)->FPC14FE0TQ0(10) Down
FPC14FE1TQ1(10)->S05F0_0(7,5,07) Down    S05F0_0(3,5,11)->FPC14FE1TQ1(10) Down

SIB 5 FCHIP 0 FCORE 1 :
-----------------------
         In-links              State            Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(11)->S05F0_1(3,0,11) Down    S05F0_1(7,0,07)->FPC00FE0TQ0(11) Down
FPC00FE1TQ1(11)->S05F0_1(3,1,11) Down    S05F0_1(7,1,07)->FPC00FE1TQ1(11) Down
FPC02FE0TQ0(11)->S05F0_1(2,0,10) Down    S05F0_1(6,0,06)->FPC02FE0TQ0(11) Down
FPC02FE1TQ1(11)->S05F0_1(2,1,10) Down    S05F0_1(6,1,06)->FPC02FE1TQ1(11) Down
FPC04FE0TQ0(11)->S05F0_1(1,0,09) Down    S05F0_1(4,0,04)->FPC04FE0TQ0(11) Down
FPC04FE1TQ1(11)->S05F0_1(1,1,09) Down    S05F0_1(4,1,04)->FPC04FE1TQ1(11) Down
FPC06FE0TQ0(11)->S05F0_1(0,0,08) Down    S05F0_1(4,2,04)->FPC06FE0TQ0(11) Down
FPC06FE1TQ1(11)->S05F0_1(0,1,08) Down    S05F0_1(4,3,04)->FPC06FE1TQ1(11) Down
FPC08FE0TQ0(11)->S05F0_1(0,2,08) OK      S05F0_1(4,4,04)->FPC08FE0TQ0(11) OK
FPC08FE1TQ1(11)->S05F0_1(0,3,08) OK      S05F0_1(4,5,04)->FPC08FE1TQ1(11) OK
FPC10FE0TQ0(11)->S05F0_1(1,2,09) Down    S05F0_1(5,0,05)->FPC10FE0TQ0(11) Down
FPC10FE1TQ1(11)->S05F0_1(1,3,09) Down    S05F0_1(5,1,05)->FPC10FE1TQ1(11) Down
FPC12FE0TQ0(11)->S05F0_1(2,2,10) OK      S05F0_1(6,2,06)->FPC12FE0TQ0(11) OK
FPC12FE1TQ1(11)->S05F0_1(2,3,10) OK      S05F0_1(6,3,06)->FPC12FE1TQ1(11) OK
FPC14FE0TQ0(11)->S05F0_1(3,2,11) Down    S05F0_1(7,2,07)->FPC14FE0TQ0(11) Down
FPC14FE1TQ1(11)->S05F0_1(3,3,11) Down    S05F0_1(7,3,07)->FPC14FE1TQ1(11) Down

SIB 6 FCHIP 0 FCORE 0 :
-----------------------
         In-links              State            Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(12)->S06F0_0(7,0,07) Down    S06F0_0(3,0,11)->FPC00FE0TQ0(12) Down
FPC00FE1TQ1(12)->S06F0_0(7,1,07) Down    S06F0_0(3,1,11)->FPC00FE1TQ1(12) Down
FPC02FE0TQ0(12)->S06F0_0(6,0,06) Down    S06F0_0(2,0,10)->FPC02FE0TQ0(12) Down
FPC02FE1TQ1(12)->S06F0_0(6,1,06) Down    S06F0_0(2,1,10)->FPC02FE1TQ1(12) Down
FPC04FE0TQ0(12)->S06F0_0(5,0,05) Down    S06F0_0(1,0,09)->FPC04FE0TQ0(12) Down
FPC04FE1TQ1(12)->S06F0_0(5,1,05) Down    S06F0_0(1,1,09)->FPC04FE1TQ1(12) Down
FPC06FE0TQ0(12)->S06F0_0(4,0,04) Down    S06F0_0(0,0,08)->FPC06FE0TQ0(12) Down
FPC06FE1TQ1(12)->S06F0_0(4,1,04) Down    S06F0_0(0,1,08)->FPC06FE1TQ1(12) Down
```

```
FPC08FE0TQ0(12)->S06F0_0(4,2,04) OK      S06F0_0(0,2,08)->FPC08FE0TQ0(12) OK
FPC08FE1TQ1(12)->S06F0_0(4,3,04) OK      S06F0_0(0,3,08)->FPC08FE1TQ1(12) OK
FPC10FE0TQ0(12)->S06F0_0(5,2,05) Down    S06F0_0(1,2,09)->FPC10FE0TQ0(12) Down
FPC10FE1TQ1(12)->S06F0_0(5,3,05) Down    S06F0_0(1,3,09)->FPC10FE1TQ1(12) Down
FPC12FE0TQ0(12)->S06F0_0(7,2,07) OK      S06F0_0(3,2,11)->FPC12FE0TQ0(12) OK
FPC12FE1TQ1(12)->S06F0_0(7,3,07) OK      S06F0_0(3,3,11)->FPC12FE1TQ1(12) OK
FPC14FE0TQ0(12)->S06F0_0(7,4,07) Down    S06F0_0(3,4,11)->FPC14FE0TQ0(12) Down
FPC14FE1TQ1(12)->S06F0_0(7,5,07) Down    S06F0_0(3,5,11)->FPC14FE1TQ1(12) Down

SIB 6 FCHIP 0 FCORE 1 :
-----------------------
          In-links              State            Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(13)->S06F0_1(3,0,11) Down    S06F0_1(7,0,07)->FPC00FE0TQ0(13) Down
FPC00FE1TQ1(13)->S06F0_1(3,1,11) Down    S06F0_1(7,1,07)->FPC00FE1TQ1(13) Down
FPC02FE0TQ0(13)->S06F0_1(2,0,10) Down    S06F0_1(6,0,06)->FPC02FE0TQ0(13) Down
FPC02FE1TQ1(13)->S06F0_1(2,1,10) Down    S06F0_1(6,1,06)->FPC02FE1TQ1(13) Down
FPC04FE0TQ0(13)->S06F0_1(1,0,09) Down    S06F0_1(4,0,04)->FPC04FE0TQ0(13) Down
FPC04FE1TQ1(13)->S06F0_1(1,1,09) Down    S06F0_1(4,1,04)->FPC04FE1TQ1(13) Down
FPC06FE0TQ0(13)->S06F0_1(0,0,08) Down    S06F0_1(4,2,04)->FPC06FE0TQ0(13) Down
FPC06FE1TQ1(13)->S06F0_1(0,1,08) Down    S06F0_1(4,3,04)->FPC06FE1TQ1(13) Down
FPC08FE0TQ0(13)->S06F0_1(0,2,08) OK      S06F0_1(4,4,04)->FPC08FE0TQ0(13) OK
FPC08FE1TQ1(13)->S06F0_1(0,3,08) OK      S06F0_1(4,5,04)->FPC08FE1TQ1(13) OK
FPC10FE0TQ0(13)->S06F0_1(1,2,09) Down    S06F0_1(5,0,05)->FPC10FE0TQ0(13) Down
FPC10FE1TQ1(13)->S06F0_1(1,3,09) Down    S06F0_1(5,1,05)->FPC10FE1TQ1(13) Down
FPC12FE0TQ0(13)->S06F0_1(2,2,10) OK      S06F0_1(6,2,06)->FPC12FE0TQ0(13) OK
FPC12FE1TQ1(13)->S06F0_1(2,3,10) OK      S06F0_1(6,3,06)->FPC12FE1TQ1(13) OK
FPC14FE0TQ0(13)->S06F0_1(3,2,11) Down    S06F0_1(7,2,07)->FPC14FE0TQ0(13) Down
FPC14FE1TQ1(13)->S06F0_1(3,3,11) Down    S06F0_1(7,3,07)->FPC14FE1TQ1(13) Down

SIB 7 FCHIP 0 FCORE 0 :
-----------------------
          In-links              State            Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(14)->S07F0_0(7,0,07) Down    S07F0_0(3,0,11)->FPC00FE0TQ0(14) Down
FPC00FE1TQ1(14)->S07F0_0(7,1,07) Down    S07F0_0(3,1,11)->FPC00FE1TQ1(14) Down
FPC02FE0TQ0(14)->S07F0_0(6,0,06) Down    S07F0_0(2,0,10)->FPC02FE0TQ0(14) Down
FPC02FE1TQ1(14)->S07F0_0(6,1,06) Down    S07F0_0(2,1,10)->FPC02FE1TQ1(14) Down
FPC04FE0TQ0(14)->S07F0_0(5,0,05) Down    S07F0_0(1,0,09)->FPC04FE0TQ0(14) Down
FPC04FE1TQ1(14)->S07F0_0(5,1,05) Down    S07F0_0(1,1,09)->FPC04FE1TQ1(14) Down
FPC06FE0TQ0(14)->S07F0_0(4,0,04) Down    S07F0_0(0,0,08)->FPC06FE0TQ0(14) Down
FPC06FE1TQ1(14)->S07F0_0(4,1,04) Down    S07F0_0(0,1,08)->FPC06FE1TQ1(14) Down
FPC08FE0TQ0(14)->S07F0_0(4,2,04) OK      S07F0_0(0,2,08)->FPC08FE0TQ0(14) OK
FPC08FE1TQ1(14)->S07F0_0(4,3,04) OK      S07F0_0(0,3,08)->FPC08FE1TQ1(14) OK
FPC10FE0TQ0(14)->S07F0_0(5,2,05) Down    S07F0_0(1,2,09)->FPC10FE0TQ0(14) Down
FPC10FE1TQ1(14)->S07F0_0(5,3,05) Down    S07F0_0(1,3,09)->FPC10FE1TQ1(14) Down
FPC12FE0TQ0(14)->S07F0_0(7,2,07) OK      S07F0_0(3,2,11)->FPC12FE0TQ0(14) OK
FPC12FE1TQ1(14)->S07F0_0(7,3,07) OK      S07F0_0(3,3,11)->FPC12FE1TQ1(14) OK
FPC14FE0TQ0(14)->S07F0_0(7,4,07) Down    S07F0_0(3,4,11)->FPC14FE0TQ0(14) Down
FPC14FE1TQ1(14)->S07F0_0(7,5,07) Down    S07F0_0(3,5,11)->FPC14FE1TQ1(14) Down

SIB 7 FCHIP 0 FCORE 1 :
-----------------------
          In-links              State            Out-links             State
--------------------------------------------------------------------------------
FPC00FE0TQ0(15)->S07F0_1(3,0,11) Down    S07F0_1(7,0,07)->FPC00FE0TQ0(15) Down
FPC00FE1TQ1(15)->S07F0_1(3,1,11) Down    S07F0_1(7,1,07)->FPC00FE1TQ1(15) Down
FPC02FE0TQ0(15)->S07F0_1(2,0,10) Down    S07F0_1(6,0,06)->FPC02FE0TQ0(15) Down
FPC02FE1TQ1(15)->S07F0_1(2,1,10) Down    S07F0_1(6,1,06)->FPC02FE1TQ1(15) Down
FPC04FE0TQ0(15)->S07F0_1(1,0,09) Down    S07F0_1(4,0,04)->FPC04FE0TQ0(15) Down
FPC04FE1TQ1(15)->S07F0_1(1,1,09) Down    S07F0_1(4,1,04)->FPC04FE1TQ1(15) Down
```



```
FPC06FE0TQ0(15)->S07F0_1(0,0,08) Down    S07F0_1(4,2,04)->FPC06FE0TQ0(15) Down
FPC06FE1TQ1(15)->S07F0_1(0,1,08) Down    S07F0_1(4,3,04)->FPC06FE1TQ1(15) Down
FPC08FE0TQ0(15)->S07F0_1(0,2,08) OK      S07F0_1(4,4,04)->FPC08FE0TQ0(15) OK
FPC08FE1TQ1(15)->S07F0_1(0,3,08) OK      S07F0_1(4,5,04)->FPC08FE1TQ1(15) OK
FPC10FE0TQ0(15)->S07F0_1(1,2,09) Down    S07F0_1(5,0,05)->FPC10FE0TQ0(15) Down
FPC10FE1TQ1(15)->S07F0_1(1,3,09) Down    S07F0_1(5,1,05)->FPC10FE1TQ1(15) Down
FPC12FE0TQ0(15)->S07F0_1(2,2,10) OK      S07F0_1(6,2,06)->FPC12FE0TQ0(15) OK
FPC12FE1TQ1(15)->S07F0_1(2,3,10) OK      S07F0_1(6,3,06)->FPC12FE1TQ1(15) OK
FPC14FE0TQ0(15)->S07F0_1(3,2,11) Down    S07F0_1(7,2,07)->FPC14FE0TQ0(15) Down
FPC14FE1TQ1(15)->S07F0_1(3,3,11) Down    S07F0_1(7,3,07)->FPC14FE1TQ1(15) Down

SIB 8 FCHIP 0 FCORE 0 :
-----------------------
         In-links             State            Out-links            State
--------------------------------------------------------------------------------
FPC00FE0TQ0(16)->S08F0_0(7,0,07) Down    S08F0_0(3,0,11)->FPC00FE0TQ0(16) Down
FPC00FE1TQ1(16)->S08F0_0(7,1,07) Down    S08F0_0(3,1,11)->FPC00FE1TQ1(16) Down
FPC02FE0TQ0(16)->S08F0_0(6,0,06) Down    S08F0_0(2,0,10)->FPC02FE0TQ0(16) Down
FPC02FE1TQ1(16)->S08F0_0(6,1,06) Down    S08F0_0(2,1,10)->FPC02FE1TQ1(16) Down
FPC04FE0TQ0(16)->S08F0_0(5,0,05) Down    S08F0_0(1,0,09)->FPC04FE0TQ0(16) Down
FPC04FE1TQ1(16)->S08F0_0(5,1,05) Down    S08F0_0(1,1,09)->FPC04FE1TQ1(16) Down
FPC06FE0TQ0(16)->S08F0_0(4,0,04) Down    S08F0_0(0,0,08)->FPC06FE0TQ0(16) Down
FPC06FE1TQ1(16)->S08F0_0(4,1,04) Down    S08F0_0(0,1,08)->FPC06FE1TQ1(16) Down
FPC08FE0TQ0(16)->S08F0_0(4,2,04) OK      S08F0_0(0,2,08)->FPC08FE0TQ0(16) OK
FPC08FE1TQ1(16)->S08F0_0(4,3,04) OK      S08F0_0(0,3,08)->FPC08FE1TQ1(16) OK
FPC10FE0TQ0(16)->S08F0_0(5,2,05) Down    S08F0_0(1,2,09)->FPC10FE0TQ0(16) Down
FPC10FE1TQ1(16)->S08F0_0(5,3,05) Down    S08F0_0(1,3,09)->FPC10FE1TQ1(16) Down
FPC12FE0TQ0(16)->S08F0_0(7,2,07) OK      S08F0_0(3,2,11)->FPC12FE0TQ0(16) OK
FPC12FE1TQ1(16)->S08F0_0(7,3,07) OK      S08F0_0(3,3,11)->FPC12FE1TQ1(16) OK
FPC14FE0TQ0(16)->S08F0_0(7,4,07) Down    S08F0_0(3,4,11)->FPC14FE0TQ0(16) Down
FPC14FE1TQ1(16)->S08F0_0(7,5,07) Down    S08F0_0(3,5,11)->FPC14FE1TQ1(16) Down

SIB 8 FCHIP 0 FCORE 1 :
-----------------------
         In-links             State            Out-links            State
--------------------------------------------------------------------------------
FPC00FE0TQ0(17)->S08F0_1(3,0,11) Down    S08F0_1(7,0,07)->FPC00FE0TQ0(17) Down
FPC00FE1TQ1(17)->S08F0_1(3,1,11) Down    S08F0_1(7,1,07)->FPC00FE1TQ1(17) Down
FPC02FE0TQ0(17)->S08F0_1(2,0,10) Down    S08F0_1(6,0,06)->FPC02FE0TQ0(17) Down
FPC02FE1TQ1(17)->S08F0_1(2,1,10) Down    S08F0_1(6,1,06)->FPC02FE1TQ1(17) Down
FPC04FE0TQ0(17)->S08F0_1(1,0,09) Down    S08F0_1(4,0,04)->FPC04FE0TQ0(17) Down
FPC04FE1TQ1(17)->S08F0_1(1,1,09) Down    S08F0_1(4,1,04)->FPC04FE1TQ1(17) Down
FPC06FE0TQ0(17)->S08F0_1(0,0,08) Down    S08F0_1(4,2,04)->FPC06FE0TQ0(17) Down
FPC06FE1TQ1(17)->S08F0_1(0,1,08) Down    S08F0_1(4,3,04)->FPC06FE1TQ1(17) Down
FPC08FE0TQ0(17)->S08F0_1(0,2,08) OK      S08F0_1(4,4,04)->FPC08FE0TQ0(17) OK
FPC08FE1TQ1(17)->S08F0_1(0,3,08) OK      S08F0_1(4,5,04)->FPC08FE1TQ1(17) OK
FPC10FE0TQ0(17)->S08F0_1(1,2,09) Down    S08F0_1(5,0,05)->FPC10FE0TQ0(17) Down
FPC10FE1TQ1(17)->S08F0_1(1,3,09) Down    S08F0_1(5,1,05)->FPC10FE1TQ1(17) Down
FPC12FE0TQ0(17)->S08F0_1(2,2,10) OK      S08F0_1(6,2,06)->FPC12FE0TQ0(17) OK
FPC12FE1TQ1(17)->S08F0_1(2,3,10) OK      S08F0_1(6,3,06)->FPC12FE1TQ1(17) OK
FPC14FE0TQ0(17)->S08F0_1(3,2,11) Down    S08F0_1(7,2,07)->FPC14FE0TQ0(17) Down
FPC14FE1TQ1(17)->S08F0_1(3,3,11) Down    S08F0_1(7,3,07)->FPC14FE1TQ1(17) Down
```


show chassis fabric degraded-fabric-reachability

Syntax show chassis fabric degraded-fabric-reachability

Release Information Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.

Description Display the current state of reachability between the Packet Forwarding Engines in the system.

Additional Information

Required Privilege Level view

Related Documentation

- show chassis fabric errors on page 1016
- show chassis fabric reachability on page 1125
- degraded on page 479

List of Sample Output show chassis fabric degraded-fabric-reachability on page 1178

Output Fields Table 67 on page 1003 lists the output fields for the **show chassis fabric degraded-fabric-reachability** command. Output fields are listed in the approximate order in which they appear.

Table 81: show chassis fabric degraded-fabric-reachability Output Fields

Field Name	Field Description
FPC	Display fabric reachability for the displayed FPC slot.
PFE	Display fabric reachability for the displayed PFE slot on a per SIB and plane basis.
SIBx_Plane y	Display the SIB (x) and plane (y) where link errors occurred.
Link errors FPC/PFEs	Display the list of FPC and PFE slots that are unreachable for the displayed SIB and plane due to link errors.

Sample Output

show chassis fabric degraded-fabric-reachability

```
user@host> show chassis fabric degraded-fabric-reachability
Degraded Fabric reachability Information:
FPC #0
    PFE #0
      SIB0_Plane 0
           Link errors  FPC/PFEs    2/0 5/0 5/1 5/2 5/3
      SIB0_Plane 1
           Link errors  FPC/PFEs    2/0 5/0
    PFE #1
      SIB0_Plane 0
```

```
     Link errors  FPC/PFEs    2/0 5/0 5/1 5/2 5/3
SIB0_Plane 1
     Link errors  FPC/PFEs    2/0 5/0
```

show chassis fabric unreachable-destinations

Syntax **show chassis fabric unreachable-destinations**

Release Information Command introduced before Junos OS Release 11.4.
Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Switches.
Command introduced in Junos OS Release 13.1R3 for TX Matrix routers.

Description (M320 and T Series routers only) Display the list of destinations that have transitioned from a reachable state to an unreachable state.

Required Privilege Level view

Related Documentation

- show chassis fabric reachability on page 1125

List of Sample Output show chassis fabric unreachable-destinations(T640 and T1600 routers) on page 1180
show chassis fabric unreachable-destinations(TX Matrix routers) on page 1181

Output Fields The table lists the output fields for the **show chassis fabric unreachable-destinations** command. Output fields are listed in the approximate order in which they appear.

Table 82: show chassis fabric unreachable-destinations Output Fields

Field Name	Field Description
Flexible PIC Concentrator (FPC) number	Source FPC number where unreachable destinations are present.
Packet Forwarding Engine number	Source Packet Forwarding Engine number where unreachable destinations are present.
Destination error on Packet Forwarding Engine	List of destination FPCs *FPC number*/Packet Forwarding Engines *Packet Forwarding Engine number* that are not reachable from the source FPCs *FPC number*/Packet Forwarding Engines *Packet Forwarding Engine number* over the fabric.

Sample Output

show chassis fabric unreachable-destinations(T640 and T1600 routers)

```
user@host> show chassis fabric unreachable-destinations
Fabric management unreachable destinations:
FPC 2
  PFE 0
      Destination error on PFEs    2/0 3/0 3/1 7/0
FPC 3
  PFE 0
      Destination error on PFEs    2/0 3/0 3/1 7/0
FPC 3
  PFE 1
      Destination error on PFEs    2/0 3/0 3/1 7/0
FPC 7
```



```
  PFE 0
      Destination error on PFEs    2/0 3/0 3/1 7/0
```

show chassis fabric unreachable-destinations(TX Matrix routers)

```
user@host> show chassis fabric unreachable-destinations
Fabric management unreachable destinations:
FPC 10
  PFE 0
      Destination error on PFEs    10/0 16/0 16/1 17/0 17/1 19/0 20/1 21/1 22/1
24/0
       26/0 27/0 27/1 28/1 29/1 31/1
FPC 12
  PFE 0
      Destination error on PFEs    12/0 16/0 16/1 17/0 17/1 19/0 20/1 21/1 22/1
24/0
       26/0 27/0 27/1 28/1 29/1 31/1
FPC 16
  PFE 0
      Destination error on PFEs    10/0 12/0
FPC 16
  PFE 1
      Destination error on PFEs    10/0 12/0
FPC 17
  PFE 0
      Destination error on PFEs    10/0 12/0
FPC 17
  PFE 1
      Destination error on PFEs    10/0 12/0
FPC 19
  PFE 0
      Destination error on PFEs    10/0 12/0
FPC 20
  PFE 1
      Destination error on PFEs    10/0 12/0
FPC 21
  PFE 1
      Destination error on PFEs    10/0 12/0
FPC 22
  PFE 1
      Destination error on PFEs    10/0 12/0
FPC 24
  PFE 0
      Destination error on PFEs    10/0 12/0
FPC 26
  PFE 0
      Destination error on PFEs    10/0 12/0
FPC 27
  PFE 0
      Destination error on PFEs    10/0 12/0
FPC 27
  PFE 1
      Destination error on PFEs    10/0
FPC 28
  PFE 1
      Destination error on PFEs    10/0 12/0
FPC 29
  PFE 1
      Destination error on PFEs    10/0 12/0
FPC 31
```

```
PFE 1
    Destination error on PFEs    10/0 12/0
```


show chassis fan

List of Syntax

Syntax

```
show chassis fan
```

Syntax (ACX4000 Series Router)

```
show chassis fan
```

Syntax (MX Series Router)

```
show chassis fan
<all-members>
<local>
<member member-id>
```

Syntax (T Series Routers)

```
show chassis fan
```

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router)

```
show chassis fan
```

Syntax (QFX Series)

```
show chassis fan
<interconnect-device name>
```

Syntax (OCX Series)

```
show chassis fan
```

Syntax (TX Matrix Router)

```
show chassis fan
<lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
show chassis fan
<lcc number | sfc number>
```

Release Information

Command introduced in Junos OS Release 10.0 on MX Series 3D Universal Edge Routers, M120 routers, and M320 routers, T320 routers, T640 routers, T1600 routers, TX Matrix Routers, and TX Matrix Plus routers.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 11.4 for EX Series switches.
Command introduced in Junos OS Release 12.3 for PTX5000 Packet Transport Routers.
Command introduced in Junos OS Release 12.1 for T4000 routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for ACX Series Routers.

Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description (T Series routers, TX Matrix routers, TX Matrix Plus routers, M120 routers, M320 routers, MX104 routers, MX2010 routers, MX2020 routers, MX Series 3D Universal Edge Routers, QFX3008-I Interconnect devices, QFX Series, OCX Series, EX Series switches, and PTX Series Packet Transport Routers only) Show information about the fan tray and fans.

Options

all-members—(MX Series routers only) (Optional) Display information about the fan tray and fans for all members of the Virtual Chassis configuration.

local—(MX Series routers only) (Optional) Display information about the fan tray and fans for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display information about the fan tray and fans for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* variable with a value 0 or 1.

interconnect-device *name*—(QFX3000-G QFabric systems only) (Optional) Display information about the fan tray and fans for the specified QFX3008-I Interconnect device.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display information about the fan tray and fans for the specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display information about the fan tray and fans for the specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc —(TX Matrix routers only) (Optional) Display information about the fan tray and fans for the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display information about the fan tray and fans for the TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with **0**.

Required Privilege Level view

List of Sample Output show chassis fan on page 1186

Output Fields

Table 66 on page 992 lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

Table 83: show chassis fan Output Fields

Field Name	Field Description
Item	Fan item identifier.
Status	Status of the fan: • **OK**—Fan is running properly and within the normal range. • **Check**—Fan is in **Check** state because of some fault or alarm condition.
RPM	(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed in revolutions per minute (RPM).
% RPM	(MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Percentage of the fan speed being used.
Measurement	(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed status based on different chassis cooling requirements: • Spinning at high speed • Spinning at intermediate speed • Spinning at normal speed • Spinning at low speed (except EX Series switches) (MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Fan speed in revolutions per minute (RPM) for each fan in the fan tray.

Sample Output

show chassis fan

user@host> **show chassis fan**

```
Item                      Status   RPM     Measurement
Top Tray Fan 1            OK       3790    Spinning at normal speed
Top Tray Fan 2            OK       3769    Spinning at normal speed
Top Tray Fan 3            OK       3769    Spinning at normal speed
Top Tray Fan 4            OK       3790    Spinning at normal speed
Top Tray Fan 5            OK       3790    Spinning at normal speed
Top Tray Fan 6            OK       3769    Spinning at normal speed
Top Tray Fan 7            OK       3790    Spinning at normal speed
Top Tray Fan 8            OK       3769    Spinning at normal speed
Top Tray Fan 9            OK       3769    Spinning at normal speed
Top Tray Fan 10           OK       3790    Spinning at normal speed
Top Tray Fan 11           OK       3790    Spinning at normal speed
Top Tray Fan 12           OK       3769    Spinning at normal speed
Bottom Tray Fan 1         OK       2880    Spinning at normal speed
Bottom Tray Fan 2         OK       2912    Spinning at normal speed
Bottom Tray Fan 3         OK       2928    Spinning at normal speed
Bottom Tray Fan 4         OK       2896    Spinning at normal speed
Bottom Tray Fan 5         OK       2896    Spinning at normal speed
Bottom Tray Fan 6         OK       2928    Spinning at normal speed
```

show chassis fan (QFabric Systems)

user@host> **show chassis fan interconnect-device *interconnect1***

```
Item                      Status   RPM     Measurement
TFT 0 Fan 0               OK       2849    Spinning at normal speed
TFT 0 Fan 1               OK       2821    Spinning at normal speed
TFT 0 Fan 2               OK       2735    Spinning at normal speed
TFT 0 Fan 3               OK       2815    Spinning at normal speed
TFT 0 Fan 4               OK       2828    Spinning at normal speed
TFT 0 Fan 5               OK       2863    Spinning at normal speed
BFT 1 Fan 0               OK       2941    Spinning at normal speed
BFT 1 Fan 1               OK       3008    Spinning at normal speed
BFT 1 Fan 2               OK       3073    Spinning at normal speed
BFT 1 Fan 3               OK       2925    Spinning at normal speed
BFT 1 Fan 4               OK       2863    Spinning at normal speed
BFT 1 Fan 5               OK       2933    Spinning at normal speed
SFT 0 Fan 0 Rotor 0       OK       15472   Spinning at normal speed
SFT 0 Fan 0 Rotor 1       OK       14477   Spinning at normal speed
SFT 0 Fan 1 Rotor 0       OK       15561   Spinning at normal speed
SFT 0 Fan 1 Rotor 1       OK       14210   Spinning at normal speed
SFT 0 Fan 2 Rotor 0       OK       16167   Spinning at normal speed
SFT 0 Fan 2 Rotor 1       OK       14248   Spinning at normal speed
SFT 0 Fan 3 Rotor 0       OK       16463   Spinning at normal speed
SFT 0 Fan 3 Rotor 1       OK       14099   Spinning at normal speed
SFT 1 Fan 0 Rotor 0       OK       15083   Spinning at normal speed
SFT 1 Fan 0 Rotor 1       OK       13533   Spinning at normal speed
SFT 1 Fan 1 Rotor 0       OK       16071   Spinning at normal speed
SFT 1 Fan 1 Rotor 1       OK       14400   Spinning at normal speed
SFT 1 Fan 2 Rotor 0       OK       15517   Spinning at normal speed
SFT 1 Fan 2 Rotor 1       OK       14210   Spinning at normal speed
SFT 1 Fan 3 Rotor 0       OK       16413   Spinning at normal speed
SFT 1 Fan 3 Rotor 1       OK       14400   Spinning at normal speed
SFT 2 Fan 0 Rotor 0       OK       15297   Spinning at normal speed
SFT 2 Fan 0 Rotor 1       OK       14634   Spinning at normal speed
```

```
SFT 2 Fan 1 Rotor 0       OK       15561    Spinning at normal speed
SFT 2 Fan 1 Rotor 1       OK       14285    Spinning at normal speed
SFT 2 Fan 2 Rotor 0       OK       15835    Spinning at normal speed
SFT 2 Fan 2 Rotor 1       OK       14400    Spinning at normal speed
SFT 2 Fan 3 Rotor 0       OK       15789    Spinning at normal speed
SFT 2 Fan 3 Rotor 1       OK       14323    Spinning at normal speed
SFT 3 Fan 0 Rotor 0       OK       16314    Spinning at normal speed
SFT 3 Fan 0 Rotor 1       OK       14876    Spinning at normal speed
SFT 3 Fan 1 Rotor 0       OK       15835    Spinning at normal speed
SFT 3 Fan 1 Rotor 1       OK       14323    Spinning at normal speed
SFT 3 Fan 2 Rotor 0       OK       16265    Spinning at normal speed
SFT 3 Fan 2 Rotor 1       OK       14594    Spinning at normal speed
SFT 3 Fan 3 Rotor 0       OK       16071    Spinning at normal speed
SFT 3 Fan 3 Rotor 1       OK       14323    Spinning at normal speed
SFT 4 Fan 0 Rotor 0       OK       15652    Spinning at normal speed
SFT 4 Fan 0 Rotor 1       OK       14438    Spinning at normal speed
SFT 4 Fan 1 Rotor 0       OK       16167    Spinning at normal speed
SFT 4 Fan 1 Rotor 1       OK       14555    Spinning at normal speed
SFT 4 Fan 2 Rotor 0       OK       16023    Spinning at normal speed
SFT 4 Fan 2 Rotor 1       OK       14361    Spinning at normal speed
SFT 4 Fan 3 Rotor 0       OK       16216    Spinning at normal speed
SFT 4 Fan 3 Rotor 1       OK       14438    Spinning at normal speed
SFT 5 Fan 0 Rotor 0       OK       15297    Spinning at normal speed
SFT 5 Fan 0 Rotor 1       OK       14173    Spinning at normal speed
SFT 5 Fan 1 Rotor 0       OK       15472    Spinning at normal speed
SFT 5 Fan 1 Rotor 1       OK       13846    Spinning at normal speed
SFT 5 Fan 2 Rotor 0       OK       15340    Spinning at normal speed
SFT 5 Fan 2 Rotor 1       OK       13917    Spinning at normal speed
SFT 5 Fan 3 Rotor 0       OK       15835    Spinning at normal speed
SFT 5 Fan 3 Rotor 1       OK       13917    Spinning at normal speed
SFT 6 Fan 0 Rotor 0       OK       15743    Spinning at normal speed
SFT 6 Fan 0 Rotor 1       OK       14594    Spinning at normal speed
SFT 6 Fan 1 Rotor 0       OK       16167    Spinning at normal speed
SFT 6 Fan 1 Rotor 1       OK       14634    Spinning at normal speed
SFT 6 Fan 2 Rotor 0       OK       16167    Spinning at normal speed
SFT 6 Fan 2 Rotor 1       OK       14516    Spinning at normal speed
SFT 6 Fan 3 Rotor 0       OK       16666    Spinning at normal speed
SFT 6 Fan 3 Rotor 1       OK       14438    Spinning at normal speed
SFT 7 Fan 0 Rotor 0       OK       15517    Spinning at normal speed
SFT 7 Fan 0 Rotor 1       OK       14438    Spinning at normal speed
SFT 7 Fan 1 Rotor 0       OK       15517    Spinning at normal speed
SFT 7 Fan 1 Rotor 1       OK       14361    Spinning at normal speed
SFT 7 Fan 2 Rotor 0       OK       16167    Spinning at normal speed
SFT 7 Fan 2 Rotor 1       OK       14555    Spinning at normal speed
SFT 7 Fan 3 Rotor 0       OK       15697    Spinning at normal speed
SFT 7 Fan 3 Rotor 1       OK       14361    Spinning at normal speed
```

show chassis fan (EX Series Switches)

user@host> **show chassis fan**

```
Item                      Status   RPM      Measurement
Fan 1                     OK       3477     Spinning at normal speed
Fan 2                     OK       3477     Spinning at normal speed
Fan 3                     OK       3479     Spinning at normal speed
Fan 4                     OK       3508     Spinning at normal speed
Fan 5                     OK       3517     Spinning at normal speed
Fan 6                     OK       3531     Spinning at normal speed
Fan 7                     OK       3439     Spinning at normal speed
Fan 8                     OK       3424     Spinning at normal speed
Fan 9                     OK       3413     Spinning at normal speed
```

```
Fan 10                   OK       3439     Spinning at normal speed
Fan 11                   OK       3446     Spinning at normal speed
Fan 12                   OK       3432     Spinning at normal speed
```

show chassis fan (T320 Router)

user@host> **show chassis fan**

```
     Item                Status   RPM      Measurement
Top Left Front fan        OK      2850     Spinning at normal speed
Top Left Middle fan       OK      2820     Spinning at normal speed
Top Left Rear fan         OK      2970     Spinning at normal speed
Top Right Front fan       OK      2790     Spinning at normal speed
Top Right Middle fan      OK      2640     Spinning at normal speed
Top Right Rear fan        OK      2790     Spinning at normal speed
Bottom Left Front fan     OK      2520     Spinning at normal speed
Bottom Left Middle fan    OK      2610     Spinning at normal speed
Bottom Left Rear fan      OK      2550     Spinning at normal speed
Bottom Right Front fan    OK      2610     Spinning at normal speed
Bottom Right Middle fan   OK      2880     Spinning at normal speed
Bottom Right Rear fan     OK      2790     Spinning at normal speed
Rear Tray Top fan         OK      2130     Spinning at normal speed
Rear Tray Second fan      OK      2190     Spinning at normal speed
Rear Tray Middle fan      OK      2250     Spinning at normal speed
Rear Tray Fourth fan      OK      2220     Spinning at normal speed
Rear Tray Bottom fan      OK      2280     Spinning at normal speed
```

show chassis fan (T640 Router)

user@host> **show chassis fan**

```
   Item                  Status   RPM      Measurement
Top Left Front fan        OK      3420     Spinning at normal speed
Top Left Middle fan       OK      3420     Spinning at normal speed
Top Left Rear fan         OK      3420     Spinning at normal speed
Top Right Front fan       OK      3420     Spinning at normal speed
Top Right Middle fan      OK      3420     Spinning at normal speed
Top Right Rear fan        OK      3450     Spinning at normal speed
Bottom Left Front fan     OK      3390     Spinning at normal speed
Bottom Left Middle fan    OK      3420     Spinning at normal speed
Bottom Left Rear fan      OK      3390     Spinning at normal speed
Bottom Right Front fan    OK      3390     Spinning at normal speed
Bottom Right Middle fan   OK      3390     Spinning at normal speed
Bottom Right Rear fan     OK      3390     Spinning at normal speed
Rear Tray Top fan         OK      5220     Spinning at normal speed
Rear Tray Second fan      OK      5220     Spinning at normal speed
Rear Tray Third fan       OK      5220     Spinning at normal speed
Rear Tray Fourth fan      OK      5220     Spinning at normal speed
Rear Tray Fifth fan       OK      5220     Spinning at normal speed
Rear Tray Sixth fan       OK      5220     Spinning at normal speed
Rear Tray Seventh fan     OK      5220     Spinning at normal speed
Rear Tray Bottom fan      OK      5220     Spinning at normal speed
```

show chassis fan (T1600 Router)

user@host> **show chassis fan**

```
  Item                   Status   RPM      Measurement
Top Left Front fan        OK      3420     Spinning at normal speed
Top Left Middle fan       OK      3420     Spinning at normal speed
Top Left Rear fan         OK      3450     Spinning at normal speed
Top Right Front fan       OK      3420     Spinning at normal speed
```

```
Top Right Middle fan       OK       3420    Spinning at normal speed
Top Right Rear fan         OK       3390    Spinning at normal speed
Bottom Left Front fan      OK       3420    Spinning at normal speed
Bottom Left Middle fan     OK       3420    Spinning at normal speed
Bottom Left Rear fan       OK       3390    Spinning at normal speed
Bottom Right Front fan     OK       3390    Spinning at normal speed
Bottom Right Middle fan    OK       3420    Spinning at normal speed
Bottom Right Rear fan      OK       3390    Spinning at normal speed
Rear Tray Top fan          OK       5190    Spinning at normal speed
Rear Tray Second fan       OK       5190    Spinning at normal speed
Rear Tray Third fan        OK       5190    Spinning at normal speed
Rear Tray Fourth fan       OK       5190    Spinning at normal speed
Rear Tray Fifth fan        OK       5190    Spinning at normal speed
Rear Tray Sixth fan        OK       5190    Spinning at normal speed
Rear Tray Seventh fan      OK       5190    Spinning at normal speed
Rear Tray Bottom fan       OK       5190    Spinning at normal speed
```

show chassis fan (T4000 Core Router)

```
user@host> show chassis fan

      Item                       Status   RPM     Measurement
      Top Left Front fan         OK       5190    Spinning at high speed
      Top Left Middle fan        OK       5220    Spinning at high speed
      Top Left Rear fan          OK       5190    Spinning at high speed
      Top Right Front fan        OK       5160    Spinning at high speed
      Top Right Middle fan       OK       5190    Spinning at high speed
      Top Right Rear fan         OK       5160    Spinning at high speed
      Bottom Left Front fan      OK       6030    Spinning at high speed
      Bottom Left Middle fan     OK       6090    Spinning at high speed
      Bottom Left Rear fan       OK       6090    Spinning at high speed
      Bottom Right Front fan     OK       6030    Spinning at high speed
      Bottom Right Middle fan    OK       6060    Spinning at high speed
      Bottom Right Rear fan      OK       6060    Spinning at high speed
      Rear Tray Top fan          OK       10000   Spinning at high speed
      Rear Tray Second fan       OK       10000   Spinning at high speed
      Rear Tray Third fan        OK       10000   Spinning at high speed
      Rear Tray Fourth fan       OK       10000   Spinning at high speed
      Rear Tray Fifth fan        OK       10000   Spinning at high speed
      Rear Tray Sixth fan        OK       10000   Spinning at high speed
      Rear Tray Seventh fan      OK       10000   Spinning at high speed
      Rear Tray Bottom fan       OK       10000   Spinning at high speed
```

show chassis fan (TX Matrix Router)

```
user@host> show chassis fan
scc-re0:
--------------------------------------------------------------------------
      Item                       Status   RPM     Measurement
      Top Left Front fan         OK       3420    Spinning at normal speed
      Top Left Middle fan        OK       3390    Spinning at normal speed
      Top Left Rear fan          OK       3420    Spinning at normal speed
      Top Right Front fan        OK       3390    Spinning at normal speed
      Top Right Middle fan       OK       3420    Spinning at normal speed
      Top Right Rear fan         OK       3390    Spinning at normal speed
      Bottom Left Front fan      OK       3420    Spinning at normal speed
      Bottom Left Middle fan     OK       3450    Spinning at normal speed
      Bottom Left Rear fan       OK       3420    Spinning at normal speed
      Bottom Right Front fan     OK       3420    Spinning at normal speed
      Bottom Right Middle fan    OK       3420    Spinning at normal speed
      Bottom Right Rear fan      OK       3420    Spinning at normal speed
```



```
      Rear Tray Top fan          OK       3420     Spinning at normal speed
      Rear Tray Second fan       OK       5190     Spinning at normal speed
      Rear Tray Third fan        OK       5190     Spinning at normal speed
      Rear Tray Fourth fan       OK       5190     Spinning at normal speed
      Rear Tray Fifth fan        OK       3420     Spinning at normal speed
      Rear Tray Sixth fan        OK       3420     Spinning at normal speed
      Rear Tray Seventh fan      OK       3420     Spinning at normal speed
      Rear Tray Bottom fan       OK       3420     Spinning at normal speed

lcc2-re0:
--------------------------------------------------------------------------
      Item                       Status   RPM      Measurement
      Top Left Front fan         OK       3420     Spinning at normal speed
      Top Left Middle fan        OK       3420     Spinning at normal speed
      Top Left Rear fan          OK       3450     Spinning at normal speed
      Top Right Front fan        OK       3420     Spinning at normal speed
      Top Right Middle fan       OK       3450     Spinning at normal speed
      Top Right Rear fan         OK       3360     Spinning at normal speed
      Bottom Left Front fan      OK       3420     Spinning at normal speed
      Bottom Left Middle fan     OK       3480     Spinning at normal speed
      Bottom Left Rear fan       OK       3420     Spinning at normal speed
      Bottom Right Front fan     OK       3420     Spinning at normal speed
      Bottom Right Middle fan    OK       3390     Spinning at normal speed
      Bottom Right Rear fan      OK       3420     Spinning at normal speed
      Rear Tray Top fan          OK       3420     Spinning at normal speed
      Rear Tray Second fan       OK       3420     Spinning at normal speed
      Rear Tray Third fan        OK       3420     Spinning at normal speed
      Rear Tray Fourth fan       OK       3420     Spinning at normal speed
      Rear Tray Fifth fan        OK       3420     Spinning at normal speed
      Rear Tray Sixth fan        OK       3420     Spinning at normal speed
      Rear Tray Seventh fan      OK       3420     Spinning at normal speed
      Rear Tray Bottom fan       OK       3420     Spinning at normal speed
```

show chassis fan (TX Matrix Plus Router)

```
user@host> show chassis fan
  sfc0-re0:
--------------------------------------------------------------------------
      Item                       Status   RPM      Measurement
      Fan Tray 0 Fan 1           OK       4350     Spinning at normal speed
      Fan Tray 0 Fan 2           OK       4380     Spinning at normal speed
      Fan Tray 0 Fan 3           OK       4410     Spinning at normal speed
      Fan Tray 0 Fan 4           OK       4380     Spinning at normal speed
      Fan Tray 0 Fan 5           OK       4350     Spinning at normal speed
      Fan Tray 0 Fan 6           OK       4380     Spinning at normal speed
      Fan Tray 1 Fan 1           OK       4410     Spinning at normal speed
      Fan Tray 1 Fan 2           OK       4380     Spinning at normal speed
      Fan Tray 1 Fan 3           OK       4410     Spinning at normal speed
      Fan Tray 1 Fan 4           OK       4380     Spinning at normal speed
      Fan Tray 1 Fan 5           OK       4410     Spinning at normal speed
      Fan Tray 1 Fan 6           OK       4410     Spinning at normal speed
      Fan Tray 2 Fan 1           OK       4380     Spinning at normal speed
      Fan Tray 2 Fan 2           OK       4380     Spinning at normal speed
      Fan Tray 2 Fan 3           OK       4380     Spinning at normal speed
      Fan Tray 2 Fan 4           OK       4410     Spinning at normal speed
      Fan Tray 2 Fan 5           OK       4380     Spinning at normal speed
      Fan Tray 2 Fan 6           OK       4410     Spinning at normal speed
      Fan Tray 2 Fan 7           OK       4410     Spinning at normal speed
      Fan Tray 2 Fan 8           OK       4380     Spinning at normal speed
      Fan Tray 2 Fan 9           OK       4380     Spinning at normal speed
      Fan Tray 3 Fan 1           OK       4350     Spinning at normal speed
```

```
       Fan Tray 3 Fan 2           OK        4380    Spinning at normal speed
       Fan Tray 3 Fan 3           OK        4410    Spinning at normal speed
       Fan Tray 3 Fan 4           OK        4440    Spinning at normal speed
       Fan Tray 3 Fan 5           OK        4380    Spinning at normal speed
       Fan Tray 3 Fan 6           OK        4410    Spinning at normal speed
       Fan Tray 3 Fan 7           OK        4410    Spinning at normal speed
       Fan Tray 3 Fan 8           OK        4380    Spinning at normal speed
       Fan Tray 3 Fan 9           OK        4410    Spinning at normal speed
       Fan Tray 4 Fan 1           OK        4410    Spinning at normal speed
       Fan Tray 4 Fan 2           OK        4410    Spinning at normal speed
       Fan Tray 4 Fan 3           OK        4380    Spinning at normal speed
       Fan Tray 4 Fan 4           OK        4380    Spinning at normal speed
       Fan Tray 4 Fan 5           OK        4410    Spinning at normal speed
       Fan Tray 4 Fan 6           OK        4410    Spinning at normal speed
       Fan Tray 4 Fan 7           OK        4410    Spinning at normal speed
       Fan Tray 4 Fan 8           OK        4410    Spinning at normal speed
       Fan Tray 4 Fan 9           OK        4410    Spinning at normal speed
       Fan Tray 5 Fan 1           OK        4350    Spinning at normal speed
       Fan Tray 5 Fan 2           OK        4380    Spinning at normal speed
       Fan Tray 5 Fan 3           OK        4380    Spinning at normal speed
       Fan Tray 5 Fan 4           OK        4350    Spinning at normal speed
       Fan Tray 5 Fan 5           OK        4380    Spinning at normal speed
       Fan Tray 5 Fan 6           OK        4410    Spinning at normal speed
       Fan Tray 5 Fan 7           OK        4410    Spinning at normal speed
       Fan Tray 5 Fan 8           OK        4380    Spinning at normal speed
       Fan Tray 5 Fan 9           OK        4410    Spinning at normal speed

lcc0-re0:
--------------------------------------------------------------------------
       Item                       Status    RPM     Measurement
       Top Left Front fan         OK        3420    Spinning at normal speed
       Top Left Middle fan        OK        3420    Spinning at normal speed
       Top Left Rear fan          OK        3420    Spinning at normal speed
       Top Right Front fan        OK        3450    Spinning at normal speed
       Top Right Middle fan       OK        3420    Spinning at normal speed
       Top Right Rear fan         OK        3420    Spinning at normal speed
       Bottom Left Front fan      OK        3420    Spinning at normal speed
       Bottom Left Middle fan     OK        3420    Spinning at normal speed
       Bottom Left Rear fan       OK        3390    Spinning at normal speed
       Bottom Right Front fan     OK        3420    Spinning at normal speed
       Bottom Right Middle fan    OK        3390    Spinning at normal speed
       Bottom Right Rear fan      OK        3390    Spinning at normal speed
       Rear Tray Top fan          OK        7050    Spinning at normal speed
       Rear Tray Second fan       OK        7050    Spinning at normal speed
       Rear Tray Third fan        OK        7050    Spinning at normal speed
       Rear Tray Fourth fan       OK        7050    Spinning at normal speed
       Rear Tray Fifth fan        OK        7050    Spinning at normal speed
       Rear Tray Sixth fan        OK        7050    Spinning at normal speed
       Rear Tray Seventh fan      OK        7050    Spinning at normal speed
       Rear Tray Bottom fan       OK        7050    Spinning at normal speed
```

show chassis fan (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fan
sfc0-re0:
--------------------------------------------------------------------------
       Item                       Status    RPM     Measurement
       Fan Tray 0 Fan 1           OK        4830    Spinning at normal speed
       Fan Tray 0 Fan 2           OK        4860    Spinning at normal speed
       Fan Tray 0 Fan 3           OK        4830    Spinning at normal speed
       Fan Tray 0 Fan 4           OK        4800    Spinning at normal speed
```



```
      Fan Tray 0 Fan 5          OK       4830    Spinning at normal speed
      Fan Tray 0 Fan 6          OK       4770    Spinning at normal speed
      Fan Tray 1 Fan 1          OK       4800    Spinning at normal speed
      Fan Tray 1 Fan 2          OK       4770    Spinning at normal speed
      Fan Tray 1 Fan 3          OK       4800    Spinning at normal speed
      Fan Tray 1 Fan 4          OK       4770    Spinning at normal speed
      Fan Tray 1 Fan 5          OK       4770    Spinning at normal speed
      Fan Tray 1 Fan 6          OK       4800    Spinning at normal speed
      Fan Tray 2 Fan 1          OK       4800    Spinning at normal speed
      Fan Tray 2 Fan 2          OK       4800    Spinning at normal speed
      Fan Tray 2 Fan 3          OK       4830    Spinning at normal speed
      Fan Tray 2 Fan 4          OK       4830    Spinning at normal speed
      Fan Tray 2 Fan 5          OK       4830    Spinning at normal speed
      Fan Tray 2 Fan 6          OK       4830    Spinning at normal speed
      Fan Tray 2 Fan 7          OK       4800    Spinning at normal speed
      Fan Tray 2 Fan 8          OK       4830    Spinning at normal speed
      Fan Tray 2 Fan 9          OK       4800    Spinning at normal speed
      Fan Tray 3 Fan 1          OK       4860    Spinning at normal speed
      Fan Tray 3 Fan 2          OK       4860    Spinning at normal speed
      Fan Tray 3 Fan 3          OK       4800    Spinning at normal speed
      Fan Tray 3 Fan 4          OK       4830    Spinning at normal speed
      Fan Tray 3 Fan 5          OK       4830    Spinning at normal speed
      Fan Tray 3 Fan 6          OK       4830    Spinning at normal speed
      Fan Tray 3 Fan 7          OK       4830    Spinning at normal speed
      Fan Tray 3 Fan 8          OK       4800    Spinning at normal speed
      Fan Tray 3 Fan 9          OK       4800    Spinning at normal speed
      Fan Tray 4 Fan 1          OK       4830    Spinning at normal speed
      Fan Tray 4 Fan 2          OK       4830    Spinning at normal speed
      Fan Tray 4 Fan 3          OK       4830    Spinning at normal speed
      Fan Tray 4 Fan 4          OK       4830    Spinning at normal speed
      Fan Tray 4 Fan 5          OK       4830    Spinning at normal speed
      Fan Tray 4 Fan 6          OK       4860    Spinning at normal speed
      Fan Tray 4 Fan 7          OK       4800    Spinning at normal speed
      Fan Tray 4 Fan 8          OK       4860    Spinning at normal speed
      Fan Tray 4 Fan 9          OK       4770    Spinning at normal speed
      Fan Tray 5 Fan 1          OK       4830    Spinning at normal speed
      Fan Tray 5 Fan 2          OK       4830    Spinning at normal speed
      Fan Tray 5 Fan 3          OK       4830    Spinning at normal speed
      Fan Tray 5 Fan 4          OK       4800    Spinning at normal speed
      Fan Tray 5 Fan 5          OK       4800    Spinning at normal speed
      Fan Tray 5 Fan 6          OK       4800    Spinning at normal speed
      Fan Tray 5 Fan 7          OK       4830    Spinning at normal speed
      Fan Tray 5 Fan 8          OK       4830    Spinning at normal speed
      Fan Tray 5 Fan 9          Check    2010

lcc0-re0:
--------------------------------------------------------------------------
      Item                      Status   RPM     Measurement
      Top Left Front fan        OK       3420    Spinning at normal speed
      Top Left Middle fan       OK       3390    Spinning at normal speed
      Top Left Rear fan         OK       3390    Spinning at normal speed
      Top Right Front fan       OK       3420    Spinning at normal speed
      Top Right Middle fan      OK       3420    Spinning at normal speed
      Top Right Rear fan        OK       3450    Spinning at normal speed
      Bottom Left Front fan     OK       3420    Spinning at normal speed
      Bottom Left Middle fan    OK       3390    Spinning at normal speed
      Bottom Left Rear fan      OK       3420    Spinning at normal speed
      Bottom Right Front fan    OK       3420    Spinning at normal speed
      Bottom Right Middle fan   OK       3390    Spinning at normal speed
      Bottom Right Rear fan     OK       3420    Spinning at normal speed
      Rear Tray fan 1 (Top)     OK       7740    Spinning at normal speed
```

```
        Rear Tray fan 2            OK       7740    Spinning at normal speed
        Rear Tray fan 3            OK       7740    Spinning at normal speed
        Rear Tray fan 4            OK       7740    Spinning at normal speed
        Rear Tray fan 5            OK       7740    Spinning at normal speed
        Rear Tray fan 6            OK       7740    Spinning at normal speed
        Rear Tray fan 7            OK       7740    Spinning at normal speed
        Rear Tray fan 8            OK       7740    Spinning at normal speed
        Rear Tray fan 9            OK       7740    Spinning at normal speed
        Rear Tray fan 10           OK       7740    Spinning at normal speed
        Rear Tray fan 11           OK       7740    Spinning at normal speed
        Rear Tray fan 12           OK       7740    Spinning at normal speed
        Rear Tray fan 13           OK       7740    Spinning at normal speed
        Rear Tray fan 14           OK       7740    Spinning at normal speed
        Rear Tray fan 15           OK       7740    Spinning at normal speed
        Rear Tray fan 16 (Bottom)  OK       7740    Spinning at normal speed

lcc2-re0:
--------------------------------------------------------------------------
        Item                       Status   RPM     Measurement
        Top Left Front fan         OK       3420    Spinning at normal speed
        Top Left Middle fan        OK       3390    Spinning at normal speed
        Top Left Rear fan          OK       3420    Spinning at normal speed
        Top Right Front fan        OK       3420    Spinning at normal speed
        Top Right Middle fan       OK       3420    Spinning at normal speed
        Top Right Rear fan         OK       3450    Spinning at normal speed
        Bottom Left Front fan      OK       3420    Spinning at normal speed
        Bottom Left Middle fan     OK       3390    Spinning at normal speed
        Bottom Left Rear fan       OK       3420    Spinning at normal speed
        Bottom Right Front fan     OK       3420    Spinning at normal speed
        Bottom Right Middle fan    OK       3390    Spinning at normal speed
        Bottom Right Rear fan      OK       3420    Spinning at normal speed
        Rear Tray fan 1 (Top)      OK       7740    Spinning at normal speed
        Rear Tray fan 2            OK       7740    Spinning at normal speed
        Rear Tray fan 3            OK       7740    Spinning at normal speed
        Rear Tray fan 4            OK       7740    Spinning at normal speed
        Rear Tray fan 5            OK       7740    Spinning at normal speed
        Rear Tray fan 6            OK       7740    Spinning at normal speed
        Rear Tray fan 7            OK       7740    Spinning at normal speed
        Rear Tray fan 8            OK       7740    Spinning at normal speed
        Rear Tray fan 9            OK       7740    Spinning at normal speed
        Rear Tray fan 10           OK       7740    Spinning at normal speed
        Rear Tray fan 11           OK       7740    Spinning at normal speed
        Rear Tray fan 12           OK       7740    Spinning at normal speed
        Rear Tray fan 13           OK       7740    Spinning at normal speed
        Rear Tray fan 14           OK       7740    Spinning at normal speed
        Rear Tray fan 15           OK       7740    Spinning at normal speed
        Rear Tray fan 16 (Bottom)  OK       7740    Spinning at normal speed
```

show chassis fan (PTX5000 Packet Transport Router)

```
user@host> show chassis fan
user@host> show chassis fan
        Item                       Status   % RPM     Measurement
        Fan Tray 0 Fan 1           OK       29%       2700 RPM
        Fan Tray 0 Fan 2           OK       29%       2700 RPM
        Fan Tray 0 Fan 3           OK       29%       2742 RPM
        Fan Tray 0 Fan 4           OK       29%       2700 RPM
        Fan Tray 0 Fan 5           OK       30%       2828 RPM
        Fan Tray 0 Fan 6           OK       30%       2828 RPM
        Fan Tray 0 Fan 7           OK       29%       2700 RPM
        Fan Tray 0 Fan 8           OK       30%       2785 RPM
```

```
Fan Tray 0 Fan 9          OK        30%        2828 RPM
Fan Tray 0 Fan 10         OK        30%        2828 RPM
Fan Tray 0 Fan 11         OK        30%        2785 RPM
Fan Tray 0 Fan 12         OK        30%        2828 RPM
Fan Tray 0 Fan 13         OK        31%        2871 RPM
Fan Tray 0 Fan 14         OK        30%        2828 RPM
Fan Tray 1 Fan 1          OK        42%        3033 RPM
Fan Tray 1 Fan 2          OK        42%        3066 RPM
Fan Tray 1 Fan 3          OK        43%        3099 RPM
Fan Tray 1 Fan 4          OK        43%        3166 RPM
Fan Tray 1 Fan 5          OK        45%        3266 RPM
Fan Tray 1 Fan 6          OK        43%        3133 RPM
Fan Tray 2 Fan 1          OK        29%        2099 RPM
Fan Tray 2 Fan 2          OK        30%        2199 RPM
Fan Tray 2 Fan 3          OK        30%        2166 RPM
Fan Tray 2 Fan 4          OK        33%        2399 RPM
Fan Tray 2 Fan 5          OK        29%        2133 RPM
Fan Tray 2 Fan 6          OK        32%        2366 RPM
```

show chassis fan (MX104 Router)

```
user@host > show chassis fan
Item                      Status    RPM     Measurement
      Fan 1                     OK        5640     Spinning at normal speed
      Fan 2                     OK        5640     Spinning at normal speed
      Fan 3                     OK        5760     Spinning at normal speed
      Fan 4                     OK        5640     Spinning at normal speed
      Fan 5                     OK        5640     Spinning at normal speed
```

show chassis fan (MX2010 Router)

```
user@host > show chassis fan
Item                      Status    % RPM     Measurement
      Fan Tray 0 Fan 1          OK        37%        3360 RPM
      Fan Tray 0 Fan 2          OK        38%        3480 RPM
      Fan Tray 0 Fan 3          OK        37%        3360 RPM
      Fan Tray 0 Fan 4          OK        37%        3360 RPM
      Fan Tray 0 Fan 5          OK        38%        3480 RPM
      Fan Tray 0 Fan 6          OK        37%        3360 RPM
      Fan Tray 1 Fan 1          OK        38%        3480 RPM
      Fan Tray 1 Fan 2          OK        40%        3600 RPM
      Fan Tray 1 Fan 3          OK        38%        3480 RPM
      Fan Tray 1 Fan 4          OK        38%        3480 RPM
      Fan Tray 1 Fan 5          OK        38%        3480 RPM
      Fan Tray 1 Fan 6          OK        38%        3480 RPM
      Fan Tray 2 Fan 1          OK        38%        3480 RPM
      Fan Tray 2 Fan 2          OK        41%        3720 RPM
      Fan Tray 2 Fan 3          OK        38%        3480 RPM
      Fan Tray 2 Fan 4          OK        38%        3480 RPM
      Fan Tray 2 Fan 5          OK        38%        3480 RPM
      Fan Tray 2 Fan 6          OK        38%        3480 RPM
      Fan Tray 3 Fan 1          OK        38%        3480 RPM
      Fan Tray 3 Fan 2          OK        40%        3600 RPM
      Fan Tray 3 Fan 3          OK        40%        3600 RPM
      Fan Tray 3 Fan 4          OK        40%        3600 RPM
      Fan Tray 3 Fan 5          OK        40%        3600 RPM
      Fan Tray 3 Fan 6          OK        38%        3480 RPM
```

show chassis fan (MX2020 Router)

```
user@host > show chassis fan
```



```
Item                      Status   % RPM     Measurement
Fan Tray 0 Fan 1          OK       37%       3360 RPM
Fan Tray 0 Fan 2          OK       37%       3360 RPM
Fan Tray 0 Fan 3          OK       36%       3240 RPM
Fan Tray 0 Fan 4          OK       37%       3360 RPM
Fan Tray 0 Fan 5          OK       37%       3360 RPM
Fan Tray 0 Fan 6          OK       37%       3360 RPM
Fan Tray 1 Fan 1          OK       37%       3360 RPM
Fan Tray 1 Fan 2          OK       37%       3360 RPM
Fan Tray 1 Fan 3          OK       37%       3360 RPM
Fan Tray 1 Fan 4          OK       37%       3360 RPM
Fan Tray 1 Fan 5          OK       37%       3360 RPM
Fan Tray 1 Fan 6          OK       36%       3240 RPM
Fan Tray 2 Fan 1          OK       37%       3360 RPM
Fan Tray 2 Fan 2          OK       37%       3360 RPM
Fan Tray 2 Fan 3          OK       37%       3360 RPM
Fan Tray 2 Fan 4          OK       37%       3360 RPM
Fan Tray 2 Fan 5          OK       37%       3360 RPM
Fan Tray 2 Fan 6          OK       38%       3480 RPM
Fan Tray 3 Fan 1          OK       38%       3480 RPM
Fan Tray 3 Fan 2          OK       38%       3480 RPM
Fan Tray 3 Fan 3          OK       38%       3480 RPM
Fan Tray 3 Fan 4          OK       37%       3360 RPM
Fan Tray 3 Fan 5          OK       37%       3360 RPM
Fan Tray 3 Fan 6          OK       37%       3360 RPM
```

show chassis fan (ACX4000 Router)

```
user@host > show chassis fan
      Item                      Status   RPM     Measurement
      Fan 1                     OK       4140    Spinning at normal speed
      Fan 2                     OK       4200    Spinning at normal speed
```

show chassis fan (QFX5100 Switch and OCX Series)

```
user@switch > show chassis fan
Item                      Status   RPM     Measurement
FPC 0 Tray 0 Fan 0        OK       6428    Spinning at normal speed
FPC 0 Tray 0 Fan 1        OK       5515    Spinning at normal speed
FPC 0 Tray 1 Fan 0        OK       6360    Spinning at normal speed
FPC 0 Tray 1 Fan 1        OK       5532    Spinning at normal speed
```


show chassis feb

Syntax show chassis feb

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.

Description (ACX Series routers, and M5, M10, and M120 routers only) Display Forwarding Engine Board (FEB) status information.

Options This command has no options.

Required Privilege Level view

Related Documentation

- request chassis feb on page 629
- show chassis fabric feb on page 1015
- show chassis fpc-feb-connectivity on page 1250
- *feb*
- *Understanding Switching Control Board Redundancy*

List of Sample Output

show chassis feb (M10 Router) on page 1197
show chassis feb (M120 Router) on page 1197
show chassis feb detail (M120 Router) on page 1198
show chassis feb detail (ACX2000 Universal Access Router) on page 1199
show chassis feb detail (ACX1000 Universal Access Router) on page 1199

Output Fields Table 84 on page 1196 lists the output fields for the **show chassis feb** command. Output fields are listed in the approximate order in which they appear.

Table 84: show chassis feb

Field Name	Field Description

State	State of the FEB:
	• **Offline**—FEB is powered down.
	• **Online**—FEB is operational and running.
	• **Check**—FEB is in alarmed state where the Switch Interface Board (SIB) plane is partially operational for the following reasons:
	  ◦ FEB is not inserted properly.
	  ◦ Two or more links between the FEB and Packet Forwarding Engine fail.

Temp (C) or Intake temperature	Temperature of the air passing by the FEB, in degrees Celsius or in both degrees Celsius and degrees Fahrenheit.

Table 84: show chassis feb *(continued)*

Field Name	Field Description
CPU Utilization (%)	Percentage of CPU being used: • **Total**—Total percentage of CPU being used by the FEB processor. • **Interrupt**—Of the total CPU being used by the FEB processor, the percentage being used for interrupts.
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FEB processor.
Utilization (%)	Percentage of memory utilization: • **Heap**—Percentage of heap space (dynamic memory) being used by the FEB processor. If this number exceeds 80 percent, you might experience a software problem (memory leak). • **Buffer**—Percentage of buffer space being used by the FPC processor for buffering internal messages.
Exhaust A temperature	Temperature of the air flowing past Exhaust A.
Exhaust B temperature	Temperature of the air flowing past Exhaust B.
Total DDR DRAM	Amount of double data rate dynamic random access memory (DDR DRAM) available to the FEB CPU.
Total RLDRAM	Amount of reduced latency dynamic random access memory (RLDRAM) available to the FEB CPU.
Start time (Detail output only)	Time when the Routing Engine detected that the FEB was running.
Uptime (Detail output only)	How long the Routing Engine has been connected to the FEB, and therefore, how long the Flexible PIC Concentrator (PIC) has been up and running.

Sample Output

show chassis feb (M10 Router)

```
user@host> show chassis feb
FEB status:
  Temperature                          27 degrees C / 80 degrees F
  CPU utilization                       3 percent
  Interrupt utilization                 0 percent
  Heap utilization                     26 percent
  Buffer utilization                   50 percent
  Total CPU DRAM                       64 MB
  Internet Processor II                   Version 1, Foundry IBM, Part number 9
  Start time:                             2010-05-23 13:59:51 PDT
  Uptime:                                 6 hours, 33 minutes, 11 seconds
```

show chassis feb (M120 Router)

```
user@host> show chassis feb
                    Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State           (C)  Total  Interrupt      DRAM (MB) Heap      Buffer
  0  Online           47      4          0       512          7         60
  1  Online           54      3          0       512          7         59
  2  Online           50      4          0       512          7         59
  3  Online           49      4          0       512          7         59
```

```
  4  Online            46       3          0       512          7          59
  5  Online            35       3          0       512          7          59
```

show chassis feb detail (M120 Router)

```
user@host> show chassis feb detail
Slot 0 information:
  State                                 Online
  Intake temperature                 48 degrees C / 118 degrees F
  Exhaust A temperature              51 degrees C / 123 degrees F
  Exhaust B temperature              52 degrees C / 125 degrees F
  Total DDR DRAM                    512 MB
  Total RLDRAM                       32 MB
  Start time:                           2006-06-28 15:00:40 PDT
  Uptime:                               10 minutes, 21 seconds
Slot 1 information:
  State                                 Online
  Intake temperature                 55 degrees C / 131 degrees F
  Exhaust A temperature              46 degrees C / 114 degrees F
  Exhaust B temperature              45 degrees C / 113 degrees F
  Total DDR DRAM                    512 MB
  Total RLDRAM                       32 MB
  Start time:                           2006-06-28 15:00:33 PDT
  Uptime:                               10 minutes, 28 seconds
Slot 2 information:
  State                                 Online
  Intake temperature                 50 degrees C / 122 degrees F
  Exhaust A temperature              47 degrees C / 116 degrees F
  Exhaust B temperature              47 degrees C / 116 degrees F
  Total DDR DRAM                    512 MB
  Total RLDRAM                       32 MB
  Start time:                           2006-06-28 15:00:35 PDT
  Uptime:                               10 minutes, 26 seconds
Slot 3 information:
  State                                 Online
  Intake temperature                 49 degrees C / 120 degrees F
  Exhaust A temperature              47 degrees C / 116 degrees F
  Exhaust B temperature              49 degrees C / 120 degrees F
  Total DDR DRAM                    512 MB
  Total RLDRAM                       32 MB
  Start time:                           2006-06-28 15:00:43 PDT
  Uptime:                               10 minutes, 18 seconds
Slot 4 information:
  State                                 Online
  Intake temperature                 45 degrees C / 113 degrees F
  Exhaust A temperature              42 degrees C / 107 degrees F
  Exhaust B temperature              42 degrees C / 107 degrees F
  Total DDR DRAM                    512 MB
  Total RLDRAM                       32 MB
  Start time:                           2006-06-28 15:00:29 PDT
  Uptime:                               10 minutes, 32 seconds
Slot 5 information:
  State                                 Online
  Intake temperature                 35 degrees C / 95 degrees F
  Exhaust A temperature              33 degrees C / 91 degrees F
  Exhaust B temperature              40 degrees C / 104 degrees F
  Total DDR DRAM                    512 MB
  Total RLDRAM                       32 MB
  Start time:                           2006-06-28 15:00:27 PDT
  Uptime:                               10 minutes, 34 seconds
```


show chassis feb detail (ACX2000 Universal Access Router)

```
user@host> show chassis feb
FEB status:
Slot 0 information:
  State                                  Online
  Temperature                         72 degrees C / 161 degrees F
  CPU utilization                     17 percent
  Interrupt utilization                7 percent
  Heap utilization                    20 percent
  Buffer utilization                  37 percent
  Total CPU DRAM                     512 MB
  Start time:                            2012-05-09 00:58:51 PDT
  Uptime:                                5 days, 21 hours, 6 minutes, 34 seconds
```

show chassis feb detail (ACX1000 Universal Access Router)

```
user@host> show chassis feb
FEB status:
Slot 0 information:
  State                                  Online
  Temperature                         46 degrees C / 114 degrees F
  CPU utilization                     15 percent
  Interrupt utilization                5 percent
  Heap utilization                    45 percent
  Buffer utilization                  37 percent
  Total CPU DRAM                     256 MB
  Start time:                            2012-06-05 19:51:53 PDT
  Uptime:                                19 minutes, 6 seconds
```


show chassis firmware

List of Syntax

Syntax

show chassis firmware

Syntax (TX Matrix Routers)

show chassis firmware
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis firmware
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis firmware
<all-members>
<local>
<member *member-id*>

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis firmware

Syntax (QFX Series)

show chassis firmware
interconnect-device *name*
node-device *name*

Syntax (OCX Series)

show chassis firmware

Syntax (ACX Series Universal Access Routers)

show chassis firmware

Syntax (EX Series Switches)

show chassis firmware
<detail>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.4 for EX Series switches.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced for EX8200 switches in Junos OS Release 10.2 for EX Series switches.
Command introduced in Junos OS Release 11.1 for QFX Series.
Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for ACX4000 Universal Access Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description 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, QFX Series, OCX 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 routers connected to the TX Matrix Plus router.

all-members—(MX Series routers only) (Optional) Display the version levels of the firmware running for all members of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems) (Optional) Display the version levels of the firmware running on the Interconnect device.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display version levels for the firmware on a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the version levels for the firmware on a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display the version levels of the firmware running for the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Display the version levels of the firmware running for the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device—(QFabric systems only) (Optional) Display the version levels of the firmware running on the Node device.

scc—(TX Matrix router only) (Optional) Display version levels for the firmware on the TX Matrix router (switch-card chassis).

sfc ***number***—(TX Matrix Plus router only) (Optional) Display version levels for the firmware on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with **0**.

detail—(EX3200, EX3300, EX4200, and EX4500 standalone and Virtual Chassis member switches only) (Optional) Display version levels of the firmware running on the switch for its programmable hardware components.

Required Privilege Level

view

Related Documentation

- *Upgrading the HSM Firmware*

List of Sample Output

Output Fields Table 85 on page 1203 lists the output fields for the **show chassis firmware** command. Output fields are listed in the approximate order in which they appear.

Table 85: show chassis firmware Output Fields

Field Name	Field Description
Part	(MX Series, MX2010, and MX2020 routers) Chassis part name.
Type	(MX Series, MX2010, and MX2020 routers) Type of firmware: On routers: **ROM** or **O/S.** On switches: **uboot** or **loader**.
Version	(MX Series, MX2010, and MX2020 routers) Version of firmware running on the chassis part.
FPC	(*detail* option only) Number of FPC. For a standalone switch, the value is 0. For a Virtual Chassis configuration, value in the range of 0-9; refers to the member ID assigned to the switch.
AFEB	(MX104 routers) Version of the compact Forwarding Engine Board.
Boot	(*detail* option only) Version of the SYSPLD.
PoE	(*detail* option only) Version of the PoE firmware.
PFE-<*number*>	(*detail* option only) Version of the PFE used in the switch.
PHY-	(*detail* option only) Version of the physical layer device (PHY) used in the switch.
microcode	(*detail* option only) Microcode of the physical layer devices (PHY) used in the switch.
uboot	(*detail* option only) Version of the u-boot used in the switch.
loader	(*detail* option only) Version of the loader used in the switch.

Sample Output

show chassis firmware (M10 Router)

```
user@host> show chassis firmware
Part                     Type       Version
Forwarding engine board  ROM        Juniper ROM Monitor Version 4.1b2
                         O/S        Version 4.1I1 by tlim on 2000-04-24 11:27
```

show chassis firmware (M20 Router)

```
user@host> show chassis firmware
Part                     Type       Version
System switch board      ROM        Juniper ROM Monitor Version 3.4b26
                         O/S        Version 3.4I16 by smackie on 2000-02-29 2
FPC 1                    ROM        Juniper ROM Monitor Version 3.0b1
```



```
                         O/S        Version 3.4I4 by smackie on 2000-02-25 21
FPC 2                    ROM        Juniper ROM Monitor Version 3.0b1
                         O/S        Version 3.4I4 by smackie on 2000-02-25 21
```

show chassis firmware (M40 Router)

```
user@host> show chassis firmware
Part                     Type       Version
System control board     ROM        Juniper ROM Monitor Version 2.0i126Copyri
                         O/S        Version 2.0i1 by root on Thu Jul 23 00:51
FPC 5                    ROM        Juniper ROM Monitor Version 2.0i49Copyrig
                         O/S        Version 2.0i1 by root on Thu Jul 23 00:59
```

show chassis firmware (M120 Router)

```
user@host> show chassis firmware
FPC 2                    ROM        Juniper ROM Monitor Version 8.0b29
                         O/S        Version 8.2B1 by builder on 2006-10-18 16:2
FPC 3                    ROM        Juniper ROM Monitor Version 8.0b29
                         O/S        Version 8.2B1 by builder on 2006-10-18 16:2
FPC 4                    ROM        Juniper ROM Monitor Version 8.0b29
                         O/S        Version 8.2B1 by builder on 2006-10-18 16:2
FEB 3                    ROM        Juniper ROM Monitor Version 8.0b29
                         O/S        Version 8.2B1 by builder on 2006-10-18 16:1
FEB 4                    ROM        Juniper ROM Monitor Version 8.0b29
                         O/S        Version 8.2B1 by builder on 2006-10-18 16:1
```

show chassis firmware (M160 Router)

```
user@host> show chassis firmware
Part                     Type       Version
SFM 0                    ROM        Juniper ROM Monitor Version 4.0b2
                         O/S        Version 4.0I1 by tlim on 2000-02-29 11:50
SFM 1                    ROM        Juniper ROM Monitor Version 4.0b2
                         O/S        Version 4.0I1 by tlim on 2000-02-29 11:50
FPC 0                    ROM        Juniper ROM Monitor Version 4.0b2
                         O/S        Version 4.0I1 by tlim on 2000-02-29 11:56
FPC 1                    ROM        Juniper ROM Monitor Version 4.0b2
                         O/S        Version 4.0I1 by tlim on 2000-02-29 11:56
FPC 2                    ROM        Juniper ROM Monitor Version 4.0b3
                         O/S        Version 4.0I1 by tlim on 2000-02-29 11:56
```

show chassis firmware (MX104 Router)

```
user@host > show chassis firmware
Part                     Type       Version
FPC 0                    ROM        Juniper ROM Monitor Version 13.1b24
                         O/S        Version 13.2-20130514.1 by builder on 2013-
FPC 1                    ROM        Juniper ROM Monitor Version 13.1b24
                         O/S        Version 13.2-20130514.1 by builder on 2013-
FPC 2                    ROM        Juniper ROM Monitor Version 13.1b24
                         O/S        Version 13.2-20130514.1 by builder on 2013-
AFEB                     ROM        Juniper ROM Monitor Version 13.1b24
                         O/S        Version 13.2-20130514.1 by builder on 2013-
```

show chassis firmware (MX240 Router)

```
user@host> show chassis firmware
Part                     Type       Version
FPC 1                    ROM        Juniper ROM Monitor Version 8.3b1
                         O/S        Version 9.0-20080103.0 by builder on 2008-0
```



```
FPC 2                    ROM        Juniper ROM Monitor Version 8.3b1
                         O/S        Version 9.0-20080103.0 by builder on 2008-0
```

show chassis firmware (MX480 Router)

```
user@host> show chassis firmware
Part                     Type       Version
FPC 1                    ROM        Juniper ROM Monitor Version 8.3b1
                         O/S        Version 9.0-20070916.3 by builder on 2007-0
```

show chassis firmware (MX960 Router)

```
user@host> show chassis firmware
Part                     Type       Version
FPC 4                    ROM        Juniper ROM Monitor Version 8.0b8
                         O/S        Version 8.2I59 by artem on 2006-10-31 19:22
FPC 7                    ROM        Juniper ROM Monitor Version 8.2b1
                         O/S        Version 8.2-20061026.1 by builder on 2006-1
```

show chassis firmware (MX2010 Router)

```
user@host> show chassis firmware
Part                     Type       Version
FPC 0                    ROM        Juniper ROM Monitor Version 12.3b1
                         O/S        Version 12.3-20121220.0 by builder on 2012-
FPC 1                    ROM        Juniper ROM Monitor Version 10.1b3
                         O/S        Version 12.3-20121220.0 by builder on 2012-
FPC 2                    ROM        Juniper ROM Monitor Version 10.1b3
                         O/S        Version 12.3-20121220.0 by builder on 2012-
FPC 3                    ROM        Juniper ROM Monitor Version 10.1b3
                         O/S        Version 12.3-20121220.0 by builder on 2012-
FPC 4                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20121220.0 by builder on 2012-
FPC 5                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20121220.0 by builder on 2012-
FPC 6                    ROM        Juniper ROM Monitor Version 10.4b1
                         O/S        Version 12.3-20121220.0 by builder on 2012-
FPC 7                    ROM        Juniper ROM Monitor Version 10.1b3
                         O/S        Version 12.3-20121220.0 by builder on 2012-
FPC 8                    ROM        Juniper ROM Monitor Version 10.4b1
                         O/S        Version 12.3-20121220.0 by builder on 2012-
FPC 9                    ROM        Juniper ROM Monitor Version 10.4b1
                         O/S        Version 12.3-20121220.0 by builder on 2012-
SPMB 0                   ROM        Juniper ROM Monitor Version 12.1b1
                         O/S        Version 12.3-20121220.0 by builder on 2012-
SPMB 1                   ROM        Juniper ROM Monitor Version 12.1b1
                         O/S        Version 12.3-20121220.0 by builder on 2012-
```

show chassis firmware (MX2020 Router)

```
user@host> show chassis firmware
Part                     Type       Version
FPC 0                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 1                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 2                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 3                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 4                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
```

```
FPC 5                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 6                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 7                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 8                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 9                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 10                   ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 11                   ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 12                   ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 13                   ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 14                   ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 15                   ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 16                   ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 17                   ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 18                   ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
FPC 19                   ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20130415.0 by builder on 2013-
SPMB 0                   ROM        Juniper ROM Monitor Version 12.1b1
                         O/S        Version 12.3-20130415.0 by builder on 2013-
SPMB 1                   ROM        Juniper ROM Monitor Version 12.1b1
                         O/S        Version 12.3-20130415.0 by builder on 2013-
```

show chassis firmware (MX240, MX480, MX960 Router with Application Services Modular Line Card)

user@host> **show chassis firmware**

```
Part                     Type       Version
FPC 1                    ROM        Juniper ROM Monitor Version 12.1b1
                         O/S        Version 12.2I21 by manish on 2012-06-19 17:
```

show chassis firmware (EX4200 Switch)

user@switch> **show chassis firmware**

```
Part                   Type       Version
FPC 0                  uboot      U-Boot 1.1.6 (Feb  6 2008 - 11:27:42)
                       loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.1
FPC 1                  uboot      U-Boot 1.1.6 (Feb  6 2008 - 11:27:42)
                       loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.1
FPC 2                  uboot      U-Boot 1.1.6 (Feb  6 2008 - 11:27:42)
                       loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.1
```

show chassis firmware (EX8200 Switch)

user@switch> **show chassis firmware**

```
Part                     Type       Version
FPC 0                    U-Boot     U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
                         loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.2
```



```
FPC 3                    U-Boot     U-Boot 1.1.6 (Dec  4 2009 - 13:17:34) 3.1.0
                         loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 5                    U-Boot     U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
                         loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 7                    U-Boot     U-Boot 1.1.6 (Feb  6 2009 - 05:31:46) 2.4.0
                         loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.2
Routing Engine 0         U-Boot     U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
                                    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 (EX9200 Switch)

```
user@switch> show chassis firmware
 Part                     Type       Version
 FPC 2                    ROM        Juniper ROM Monitor Version 11.4b2
                          O/S        Version 14.1I20140312_0741_bavig by bavig o
FPC 3                     ROM        Juniper ROM Monitor Version 10.4b1
                          O/S        Version 14.1I20140312_0741_bavig by bavig o
```

show chassis firmware lcc (TX Matrix Router)

```
user@host> show chassis firmware lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Part                     Type       Version
FPC 1                    ROM        Juniper ROM Monitor Version 6.4b18
                         O/S        Version 7.0-20040804.0 by 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 and OCX Series)

```
user@switch> show chassis firmware
Part                      Type       Version
FPC 0
```

```
Routing Engine 0        U-Boot     U-Boot 1.1.6 (Sep 15 2010 - 02:11:11) 1.0.5
                        loader     FreeBSD/MIPS U-Boot bootstrap loader 0.1
```

show chassis firmware interconnect-device (QFabric System)

```
user@switch> show chassis firmware interconnect-device interconnect1
Part                    Type       Version
Routing Engine 0        U-Boot     U-Boot 1.1.6 (May 10 2011 - 04:52:59) 1.1.1
                        loader     FreeBSD/MIPS U-Boot bootstrap loader 0.1
Routing Engine 1        U-Boot     U-Boot 1.1.6 (May 10 2011 - 04:52:59) 1.1.1
                        loader     FreeBSD/MIPS U-Boot bootstrap loader 0.1
```

show chassis firmware (ACX2000 Universal Access Router)

```
user@switch> show chassis firmware
Part                    Type       Version
FPC                     O/S        Version 12.2I13 by jisjoy on 2012-05-29 06:
FEB                     O/S        Version 12.2I13 by jisjoy on 2012-05-29 06:
```

show chassis firmware detail (EX3300 Switch)

```
user@switch> show chassis firmware detail
FPC 0
   Boot SYSPLD              3
   PoE firmware             4.1.6
   PFE-0                    3
   PFE-1                    3
   PHY
      microcode             0x514
   Boot Firmware
      uboot                 U-Boot 1.1.6 (Aug 21 2011 - 01:45:26)   1.0.0
      loader                FreeBSD/arm U-Boot loader 1.0
```

show chassis firmware (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis firmware
Part                    Type       Version
FPC 1                   ROM        Juniper ROM Monitor Version 12.1b1
                        O/S        Version 12.2I21 by manish on 2012-06-19 17:
```

show chassis forwarding

Syntax show chassis forwarding

Release Information Current—Command introduced before Junos OS Release 7.4.
Now—Command introduced in Junos OS Release 7.4. Support for Branch SRX Series added in Junos OS Release 10.1

Description Display status of the forwarding process (fwdd). This command is supported on J Series and Branch SRX Series Services Gateways.

Options This command has no options.

Required Privilege Level view

List of Sample Output show chassis forwarding on page 1211

Output Fields Table 86 on page 1211 lists the output fields for the **show chassis forwarding** command. Output fields are listed in the approximate order in which they appear.

Table 86: show chassis forwarding Output Fields

Field Name	Field Description

FWWD status	Forwarding status:
	• **State**:
	  ◦ **Online**—FWDD is operational and running.
	  ◦ **Offline**—FWDD is not running.
	• **Microkernel CPU utilization**—Percentage of microkernel CPU being used by the forwarding process.
	• **Real-time threads CPU utilization**—Percentage of CPU being used by the forwarding process.
	• **Heap utilization**—Percentage of heap space (dynamic memory) being used by the forwarding process. If this number exceeds 80 percent, there may be a software problem (memory leak).
	• **Buffer utilization**—Percentage of buffer space being used by the forwarding process for buffering internal messages.
	• **Uptime**—How long the forwarding process has been up and running.

Sample Output

show chassis forwarding

```
user@host> show chassis forwarding
FWDD status:
  State                                 Online
  Microkernel CPU utilization        10 percent
  Real-time threads CPU utilization   4 percent
  Heap utilization                   26 percent
  Buffer utilization                  0 percent
  Uptime:                              1 day, 1 hour, 30 minutes, 11 seconds
```

show chassis fpc

List of Syntax

Syntax

show chassis fpc
<detail <*slot*>> | <pic-status <*slot*>>

Syntax (EX Series Switches)

show chassis fpc
<detail <*fpc-slot*>> | <pic-status <*fpc-slot*>>
<*fpc-slot*>

Syntax (T4000 Routers)

show chassis fpc
<detail <*fpc-slot*>>
<pic-status <*fpc-slot*>>

Syntax (TX Matrix and TX Matrix Plus Routers)

show chassis fpc
<detail <*fpc-slot*>> | <pic-status <*fpc-slot*>>
<*slot*>

Syntax (MX Series Routers and EX Series switches)

show chassis fpc
<detail <*slot*>> | <pic-status <*slot*>>
<all-members>
<local>
<member *member-id*>

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis fpc
<*slot*> detail | <detail <*slot*>> | <pic-status <*slot*>>
<*fpc-slot*>

Syntax (QFX Series)

show chassis fpc
<detail>
<interconnect-device *name* <fpc-slot *fpc-slot*>>
<node-device *name*>

Syntax (OCX Series)

show chassis fpc
<detail>

Syntax (PTX Series Packet Transport Routers)

show chassis fpc
<detail <*fpc-slot*>> | <pic-status <*fpc-slot*>>
<*fpc-slot*>

Syntax (ACX Series Universal Access Routers)

show chassis fpc
<detail <*fpc-slot*>> | <pic-status <*fpc-slot*>>
<*fpc-slot*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for QFX Series.
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display status information about the installed Flexible PIC Concentrators (FPCs)and PICs.

Options

none—Display status information for all FPCs. On a TX Matrix router, display status information for all FPCs on the attached T640 routers in the routing matrix. On a TX Matrix Plus router, display status information for all FPCs on the attached routers in the routing matrix.

NOTE: In EX8200 switches, line cards initialize Packet Forwarding Engine during startup. If an error occurs during hardware initialization, the FPCs with bad hardware parts power down after transferring the debug information to the Routing Engine. The Routing Engine marks the FPC offline, logs the error in system log messages (/var/log/messages), and generates an alarm to inform the user.

See the following sample output:

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory
Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap
  Buffer
  0  Empty
  1  Empty
  2  Empty
  3  Empty
  4  Empty
  5  Offline         ---Hard FPC error---
  6  Empty
  7  Online           26      4          0        1024        0
      32
```

The following sample output shows the alarm raised for the failed FPCs.

```
user@host > show chassis alarms
4 alarms currently active
Alarm time               Class  Description
2011-03-24 00:52:51 UTC  Major  FPC 5 Hard errors
2011-03-24 00:52:31 UTC  Major  Fan Tray Failure
2011-03-24 00:52:31 UTC  Major  Fan Tray Failure
2011-03-24 00:51:26 UTC  Minor  Loss of communication with Backup
RE
```


NOTE: On T4000 routers, when you include the **enhanced-mode** statement at the **[edit chassis network-services]** hierarchy level and reboot the system, only the T4000 Type 5 FPCs present on the router become online while the remaining FPCs are offline, and FPC misconfiguration alarms are generated. The **show chassis alarm** command output displays FPC misconfiguration (**FPC *fpc-slot* misconfig**) as the reason for the generation the alarms.

The following sample output shows the FPC status after the **enhanced-mode** statement is configured on the T4000 router. The T4000 Type 5 FPC present in slot 5 becomes online while the remaining FPCs are offline.

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory
Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap
  Buffer
  0  offline         ---FPC misconfiguration---
  1  offline         ---FPC misconfiguration---
  2  offline         ---FPC misconfiguration---
  3  Empty
  4  Empty
  5  Online            66     50          0       2816       29
    27
```

The following sample output shows FPC misconfiguration alarms.

```
user@host > show chassis alarms
3 alarms currently active
Alarm time                Class  Description
2011-03-24 00:52:51 PST  Major  FPC 1 misconfig
2011-03-24 00:52:31 PST  Major  FPC 2 misconfig
2011-03-24 00:52:31 PST  Major  FPC 3 misconfig
```

detail—(Optional) Display detailed status information for all FPCs or for the FPC in the specified slot (see ***fpc-slot*** or ***slot***).

all-members—(MX Series routers and EX Series switches only) (Optional) Display status information for all FPCs on all members of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display status information for all FPCs on the Interconnect device.

fpc-slot—(Optional) FPC slot number:

- (TX Matrix and TX Matrix Plus router only—On a TX Matrix router, if you specify the number of the T640 router (line-card chassis) by using the **lcc *number*** option (the recommended method), replace ***fpc-slot*** with a value from **0** through **7**. Otherwise, replace ***fpc-slot*** with a value from **0** through **31**. Likewise, on a TX Matrix Plus router, if you specify the number of the specified router (line-card chassis) by using the **lcc *number*** option (the recommended method), replace ***fpc-slot*** with a value from **0** through **7**. Otherwise, replace ***fpc-slot*** with a value from **0** through **31**. For example, the following commands have the same result:

user@host> **show chassis fpc detail 1 lcc 1**
user@host> **show chassis fpc detail 9**

- M120 router—Replace ***fpc-slot*** with a value from **0** through **5**.
- MX80 router—Replace ***fpc-slot*** with a value from **0** through **1**.
- MX104 router—Replace ***fpc-slot*** with a value from **0** through **2**.
- MX240 router—Replace ***fpc-slot*** with a value from **0** through **2**.
- MX480 router—Replace ***fpc-slot*** with a value from **0** through **5**.
- MX-960 router—Replace ***fpc-slot*** with a value from **0** through **11**.
- MX2010 router—Replace ***fpc-slot-number*** with a value from **0** through **9**.
- MX2020 router—Replace ***fpc-slot-number*** with a value from **0** through **19**.
- Other routers—Replace ***fpc-slot*** with a value from **0** through **7**.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—Replace ***fpc-slot*** with **0**.
  - EX4200 switches in a Virtual Chassis configuration—Replace ***fpc-slot*** with a value from **0** through **9**.
  - EX6210 switches—Replace ***fpc-slot*** with a value from **0** through **9**.
  - EX8208 switches—Replace ***fpc-slot*** with a value from **0** through **7**.
  - EX8216 switches—Replace ***fpc-slot*** with a value from **0** through **15**.
- QFX Series:
  - QFXSeries and OCX Series switches—Replace ***fpc-slot*** with 0.
  - QFabric systems—Replace ***fpc-slot*** with 0 through 31 on the Interconnect device.
- PTX Series Packet Transport Routers:
  - PTX5000 Packet Transport Router—Replace ***fpc-slot*** with a value from **0** through **7**.
- ACX Series Universal Access Routers:
  - ACX1000 and ACX2000 Universal Access Routers—Replace ***fpc-slot*** with **0**.

local—(MX Series routers and EX Series switches only) (Optional) Display status information for all FPCs on the local Virtual Chassis member.

member *member-id*—(MX Series routers and EX Series switches only) (Optional) Display status information for all FPCs on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device ***name***—(QFabric systems only) (Optional) Display status information for each Node device. Each Node device is equivalent to an FPC.

pic-status—(Optional) Display status information for all PICs or for the PIC in the specified slot (see ***fpc-slot***).

NOTE: On T1600 routers, Type 4 FPCs with ASICs based on the SL2.0 chipset do not support the 10-Gigabit Ethernet LAN/WAN PIC with SFP+ (10x10GE [LAN/WAN] SFPP). If you issue the **show chassis fpc** command with the **pic-status** option, the CLI displays the string “Not Supported” for 10x10GE(LAN/WAN) SFPP PICs installed on such FPCs. The following is a sample output:

```
user@host> show chassis fpc pic-status
Slot 0   Online       E2-FPC Type 1
  PIC 0  Online       1x G/E SFP, 1000 BASE
  PIC 1  Online       Adaptive Services-II
  PIC 2  Online       1x G/E IQ, 1000 BASE
  PIC 3  Online       1x G/E IQ, 1000 BASE
Slot 1   Online       FPC Type 3-ES
  PIC 0  Present      UNUSED- Not Supported
Slot 2   Online       FPC Type 4-ES
  PIC 0  Offline      4x OC-192 SONET XFP
  PIC 1  Present      10x10GE(LAN/WAN) SFPP- Not Supported
<<<<<<
Slot 4   Offline      FPC Type 1-ES
Slot 5   Offline      FPC Type 2-ES
Slot 6   Online       E2-FPC Type 3
  PIC 0  Online       1x OC-192 SONET XFP
  PIC 1  Online       4x OC-48 SONET
  PIC 2  Online       4x OC-48 SONET
  PIC 3  Online       MultiServices 500
Slot 7   Online       FPC Type 4-ES
  PIC 0  Online       4x 10GE (LAN/WAN) XFP
  PIC 1  Online       4x 10GE (LAN/WAN) XFP
```

In addition, an entry is logged in the system log messages (/var/log/messages) that the PIC is not supported. The following is a sample message logged in the system log:

```
Apr  5 08:47:36  router1 chassisd[2770]: CHASSISD_UNSUPPORTED_PIC:
 PIC 1 in FPC 2 (type 763, version 257) is not supported
```

If you see this issue, contact Juniper Networks Technical Assistance Center (JTAC) for a possible fix. For more information about this issue and a possible solution, see PSN-2010-03-696.

NOTE: When there is a double-bit ECC error in a network processor's memory, the Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP or Channelized E1/T1 Circuit Emulation MIC is switched to the offline state.

```
user@host> show chassis fpc pic-status
Slot 1   Online       MPC Type 2 3D Q
PIC 0  Offline      1xCOC12/4xCOC3 CH-CE- ECC error detected
```

lcc ***number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

Required Privilege Level view

Related Documentation

- request chassis fpc on page 631
- show chassis fpc-feb-connectivity on page 1250
- show chassis fabric fpcs on page 1021
- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 289

- *MX960 Flexible PIC Concentrator Description*
- *ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping*

- enhanced-mode on page 485

List of Sample Output

Output Fields Table 87 on page 1220 lists the output fields for the **show chassis fpc** command. Output fields are listed in the approximate order in which they appear.

Table 87: show chassis fpc Output Fields

Field Name	Field Description	Level of Output

Slot or **Slot State**	Slot number and state. The state can be one of the following conditions:
	• **Dead**—Held in reset because of errors.
	• **Diag**—Slot is being ignored while the FPC is running diagnostics.
	• **Dormant**—Held in reset.
	• **Empty**—No FPC is present.
	• **Offline**—(PTX Series Packet Transport Routers only) One of the following two states is displayed:
	  ◦ **FPC offlined due to unreachable destinations**
	  ◦ **FPC Offlined due to degraded FPC action**
	• **Online**—FPC is online and running.
	• **Present**—FPC is detected by the chassis daemon but either is not supported by the current version of Junos OS or is inserted in the wrong slot. The output also states either **Hardware Not Supported** or **Hardware Not In Right Slot**. The FPC is coming up but not yet online.
	• **Probed**—Probe is complete; awaiting restart of the Packet Forwarding Engine.
	• **Probe-wait**—Waiting to be probed.
		all levels

Logical slot	Slot number.	all levels
Temp (C) or **Temperature**	Temperature of the air passing by the FPC, in degrees Celsius or in both Celsius and Fahrenheit.	all levels all levels

Table 87: show chassis fpc Output Fields *(continued)*

Field Name	Field Description	Level of Output
Temperature (PTX Series)	On PTX Series Packet Transport Routers, temperature details are provided in degrees Celsius and Fahrenheit. Output includes: • Temperature (PMB)—Temperature of the air passing by the Processor Mezzanine Board (PMB) at the bottom of the FPC. • Temperature (Intake)—Temperature of the air flowing into the chassis. • Temperature (Exhaust)—Exhaust temperatures for multiple zones (Exhaust A and Exhaust B). • Temperature (TL*n*)-–Temperature of the specified Lookup ASIC (TL) of the packet forwarding engine on the FPC. • Temperature (TQ*n*)-–Temperature of the specified Queuing and Memory Interface ASIC (TQ) of the packet forwarding engine on the FPC.	**detail**
Total CPU Utilization (%)	Total percentage of CPU being used by the FPC's processor.	all levels
Interrupt CPU Utilization (%)	Of the total CPU being used by the FPC's processor, the percentage being used for interrupts.	none specified
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FPC's processor.	none specified
Heap Utilization (%)	Percentage of heap space (dynamic memory) being used by the FPC's processor. If this number exceeds 80 percent, there may be a software problem (memory leak). NOTE: On MX Series routers and EX Series switches in a broadband edge environment, heap utilization levels higher than 70 percent can affect unified ISSU, router stability, or scaling capability.	none specified
Buffer Utilization (%)	Percentage of buffer space being used by the FPC's processor for buffering internal messages.	none specified
Total CPU DRAM	Amount of DRAM available to the FPC's CPU.	**detail**
Total RLDRAM	Amount of reduced latency dynamic random access memory (RLDRAM) available to the FPC CPU.	**detail**
Total DDR DRAM	Amount of double data rate dynamic random access memory (DDR DRAM) available to the FPC CPU.	**detail**
Total SRAM	Amount of static RAM (SRAM) used by the FPC's CPU.	**detail**
Total SDRAM	Total amount of memory used for storing packets and notifications.	**detail**
I/O Manager ASICs information	I/O Manager version number, manufacturer, and part number.	**detail**
Start time	Time when the Routing Engine detected that the FPC was running.	**detail**

Table 87: show chassis fpc Output Fields *(continued)*

Field Name	Field Description	Level of Output
Uptime	How long the Routing Engine has been connected to the FPC and, therefore, how long the FPC has been up and running.	**detail**
PIC type	(**pic-status** output only) Type of PIC.	none specified

Sample Output

show chassis fpc (EX6210 Switch)

```
user@switch> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Empty
  1  Online             7      5          0       1024        0         32
  2  Empty
  3  Empty
  4  Online            25     17          2       2048        0         30
  5  Online            25      3          0       2048        0         24
  6  Online             6      5          0       1024        0         32
  7  Empty
  8  Empty
  9  Online             8      7          0       1024        0         32
```

show chassis fpc (M10 Router)

```
user@host> show chassis fpc
FPC status:
               Temp
Slot State      (C)
  0  Online      27
  1  Online      28
```

show chassis fpc (M20 Router)

```
user@host> show chassis fpc
FPC status:
               Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State      (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Empty        0      0          0         0        0          0
  1  Online      38      0          0         8        0          4
  2  Online      35      0          0         8        0          3
  3  Empty        0      0          0         0        0          0
```

show chassis fpc detail (M Series Routers)

```
user@host> show chassis fpc detail 1
Slot 1 information:
  State                               Online
  Temperature                      48 degrees C
  Total CPU DRAM                   32 MB
  Total SRAM                        4 MB
  Total SDRAM                     256 MB
  I/O Manager ASICs information       Version 2.0, Foundry IBM, Part number 0
  I/O Manager ASICs information       Version 2.0, Foundry IBM, Part number 0
```

```
  Start time                         2000-02-08 02:18:49 UTC
  Uptime                             14 hours, 41 minutes, 41 seconds
```

show chassis fpc detail (MX80 Router)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                              Online
  Temperature                     47 degrees C / 116 degrees F
  Total CPU DRAM                1024 MB
  Total SRAM                     331 MB
  Total SDRAM                   1280 MB
  Start time                         2010-02-08 12:25:33 PST
  Uptime                             2 hours, 13 minutes, 19 seconds
Slot 1 information:
  State                              Online
  Temperature                     47 degrees C / 116 degrees F
  Total CPU DRAM                1024 MB
  Total SRAM                     331 MB
  Total SDRAM                   1280 MB
  Start time                         2010-02-08 12:25:33 PST
  Uptime                             2 hours, 13 minutes, 19 seconds
```

show chassis fpc (MX104 Router)

```
user@host> show chassis fpc
Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap      Buffer
  0  Online            32     15          5       2048       22          13
  1  Online            32     15          5       2048       22          13
  2  Online            32     15          5       2048       22          13
```

show chassis fpc detail (MX104 Router)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                              Online
  Temperature                     32 (C)
  Total CPU DRAM                2048 MB
  Total SRAM                     403 MB
  Total SDRAM                   1316 MB
  Start time                         2013-05-23 14:39:18 IST
  Uptime                             1 hour, 20 minutes, 22 seconds
Slot 1 information:
  State                              Online
  Temperature                     32 (C)
  Total CPU DRAM                2048 MB
  Total SRAM                     403 MB
  Total SDRAM                   1316 MB
  Start time                         2013-05-23 14:39:18 IST
  Uptime                             1 hour, 20 minutes, 22 seconds
Slot 2 information:
  State                              Online
  Temperature                     32 (C)
  Total CPU DRAM                2048 MB
  Total SRAM                     403 MB
  Total SDRAM                   1316 MB
  Start time                         2013-05-23 14:39:18 IST
  Uptime                             1 hour, 20 minutes, 22 seconds
```

show chassis fpc pic-status (MX104 Router)

```
user@host> show chassis fpc pic-status
Slot 0   Online
Slot 1   Online
  PIC 0  Online       10x 1GE(LAN) -E  SFP
  PIC 1  Online       10x 1GE(LAN) -E  SFP
Slot 2   Online
  PIC 0  Online       4x 10GE(LAN) SFP+
```

show chassis fpc (MX240 Router)

```
user@host> show chassis fpc
               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 (EX Series Switch)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap      Buffer
  0  Empty
  1  Online            41     13          0       2048        19          14
  2  Online            42     12          0       2048        19          14
```

show chassis fpc detail (EX9200 Switch)

```
user@switch> show chassis fpc detail
Slot 2 information:
  State                               Online
  Temperature                      37
  Total CPU DRAM                 2048 MB
  Total RLDRAM                    331 MB
  Total DDR DRAM                 1536 MB
  Start time:                         2014-03-12 15:35:28 UTC
  Uptime:                             1 hour, 4 minutes, 29 seconds
  Max Power Consumption           239 Watts
Slot 3 information:
  State                               Online
  Temperature                      39
  Total CPU DRAM                 2048 MB
  Total RLDRAM                   1036 MB
  Total DDR DRAM                 6656 MB
  Start time:                         2014-03-12 15:00:18 UTC
  Uptime:                             1 hour, 39 minutes, 39 seconds
  Max Power Consumption           520 Watts
```

show chassis fpc (MX480 Router)

```
user@host> show chassis fpc
              Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State     (C)  Total  Interrupt      DRAM (MB) Heap      Buffer
  0  Empty
  1  Online     36      9          0       1024        17          57
  2  Empty
  3  Empty
  4  Empty
  5  Empty
```


show chassis fpc (MX480 Router with 100-Gigabit Ethernet CFP)

```
user@host> show chassis fpc
           Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State   (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
 0  Online     33   4      0             2048       10        13
 1  Online     36   7      0             2048       16        13
 2  Online     29   6      0             1024       27        29
 3  Online     33   0      0                0        0         0
 4  Online     36   7      0             2048       19        13
 5  Online     34  31     11             2048       14        13
```

show chassis fpc pic-status (MX480 Router with 100-Gigabit Ethernet CFP)

```
user@host> show chassis fpc pic-status
Slot 1   Online        MPC Type 3
  PIC 2  Online        1X100GE CFP
 Slot 2  Online        DPCE 40x 1GE R EQ
  PIC 0  Online        10x 1GE(LAN) EQ
  PIC 1  Online        10x 1GE(LAN) EQ
  PIC 2  Online        10x 1GE(LAN) EQ
  PIC 3  Online        10x 1GE(LAN) EQ
 Slot 3  Online        MPC Type 3
  PIC 0  Online        1X100GE CFP
  PIC 2  Online        1X100GE CFP
 Slot 4  Online        MPC Type 3
  PIC 0  Online        1X100GE CFP
  PIC 2  Online        1X100GE CFP
 Slot 5  Online        MPC Type 2 3D EQ
  PIC 0  Online        2x 10GE  XFP
  PIC 1  Online        2x 10GE  XFP
  PIC 2  Online        10x 1GE(LAN) SFP
  PIC 3  Online        10x 1GE(LAN) SFP
```

show chassis fpc pic-status (EX Series Switch)

```
user@host> show chassis fpc pic-status
Slot 1   Online        EX9200 32x10G SFP
  PIC 0  Online        8X10GE SFPP
  PIC 1  Online        8X10GE SFPP
  PIC 2  Online        8X10GE SFPP
  PIC 3  Online        8X10GE SFPP
Slot 2   Online        EX9200 32x10G SFP
  PIC 0  Online        8X10GE SFPP
  PIC 1  Online        8X10GE SFPP
  PIC 2  Online        8X10GE SFPP
  PIC 3  Online        8X10GE SFPP
```

show chassis fpc (MX480 Router with MPC4E)

```
user@host> show chassis fpc
          Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap      Buffer
  0  Empty
  1  Empty
  2  Online            38       7          0       2048       19         14
  3  Online            39       8          0       2048       18         14
  4  Online            39       7          0       2048       17         14
  5  Empty
```

show chassis fpc detail (MX480 Router with MPC4E)

```
user@host> show chassis fpc detail
Slot 2 information:
  State                                   Online
  Temperature                          38
  Total CPU DRAM                     2048 MB
  Total RLDRAM                       1036 MB
  Total DDR DRAM                     11264 MB
  Start time:                             2013-02-18 05:06:57 PST
  Uptime:                                 17 hours, 41 minutes, 9 seconds
  Max Power Consumption               610 Watts
Slot 3 information:
  State                                   Online
  Temperature                          38
  Total CPU DRAM                     2048 MB
  Total RLDRAM                       1036 MB
  Total DDR DRAM                     11264 MB
  Start time:                             2013-02-18 05:07:00 PST
  Uptime:                                 17 hours, 41 minutes, 6 seconds
  Max Power Consumption               610 Watts
Slot 4 information:
  State                                   Diagnostics
  Temperature                          37
  Total CPU DRAM                        0 MB
  Total RLDRAM                          0 MB
  Total DDR DRAM                        0 MB
  Max Power Consumption               520 Watts
```

show chassis fpc (MX480 Router with MPC4E)

```
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      38      7          0       2048       19         14
  3  Online      39      8          0       2048       18         14
  4  Online      39      7          0       2048       17         14
  5  Empty
```

show chassis fpc detail (MX480 Router with MPC4E)

```
user@host> show chassis fpc detail
Slot 2 information:
  State                                   Online
  Temperature                          38
  Total CPU DRAM                     2048 MB
  Total RLDRAM                       1036 MB
  Total DDR DRAM                     11264 MB
  Start time:                             2013-02-18 05:06:57 PST
  Uptime:                                 17 hours, 41 minutes, 9 seconds
  Max Power Consumption               610 Watts
Slot 3 information:
  State                                   Online
  Temperature                          38
  Total CPU DRAM                     2048 MB
  Total RLDRAM                       1036 MB
  Total DDR DRAM                     11264 MB
  Start time:                             2013-02-18 05:07:00 PST
  Uptime:                                 17 hours, 41 minutes, 6 seconds
```



```
  Max Power Consumption            610 Watts
Slot 4 information:
  State                                Diagnostics
  Temperature                       37
  Total CPU DRAM                     0 MB
  Total RLDRAM                       0 MB
  Total DDR DRAM                     0 MB
  Max Power Consumption            520 Watts
```

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 (MX960 Router with MPC5EQ)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online            38     16          0       3584        7         13
  1  Online            31     15          0       2048       17         13
  2  Empty
  3  Online            31     14          0       2048       20         13
  4  Online            34     16          0       3584        7         13
  5  Online            34     16          0       3584        7         13
  6  Empty
  7  Online            32      9          0       2048       18         14
  8  Online            36     19          0       3584        7         13
  9  Online            31      9          0       2048       13         13
 10  Online            35     14          0       3584        7         13
 11  Online            33     11          0       2048       18         14
```

show chassis fpc detail (MX960 Router with MPC5EQ)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                                Online
  Temperature                       38
  Total CPU DRAM                  3584 MB
  Total XR2                        291 MB
  Total DDR DRAM                 24960 MB
  Start time:                          2014-04-22 10:01:46 PDT
  Uptime:                              1 hour, 23 minutes, 40 seconds
  Max Power Consumption            607 Watts
Slot 1 information:
  State                                Online
  Temperature                       31
  Total CPU DRAM                  2048 MB
  Total RLDRAM                    1036 MB
```

```
    Total DDR DRAM                6656 MB
    Start time:                        2014-04-22 10:01:50 PDT
    Uptime:                            1 hour, 23 minutes, 36 seconds
    Max Power Consumption          520 Watts
  Slot 3 information:
    State                              Online
    Temperature                     31
    Total CPU DRAM                2048 MB
    Total RLDRAM                  1324 MB
    Total DDR DRAM                5120 MB
    Start time:                        2014-04-22 10:01:50 PDT
    Uptime:                            1 hour, 23 minutes, 36 seconds
    Max Power Consumption          440 Watts
  Slot 4 information:
    State                              Online
    Temperature                     34
    Total CPU DRAM                3584 MB
    Total XR2                      291 MB
    Total DDR DRAM                24960 MB
    Start time:                        2014-04-22 10:01:54 PDT
    Uptime:                            1 hour, 23 minutes, 32 seconds
    Max Power Consumption          607 Watts
  Slot 5 information:
    State                              Online
    Temperature                     34
    Total CPU DRAM                3584 MB
    Total XR2                      291 MB
    Total DDR DRAM                24960 MB
    Start time:                        2014-04-22 10:01:56 PDT
    Uptime:                            1 hour, 23 minutes, 30 seconds
    Max Power Consumption          607 Watts
  Slot 7 information:
    State                              Online
    Temperature                     32
    Total CPU DRAM                2048 MB
    Total RLDRAM                  1036 MB
    Total DDR DRAM                11264 MB
    Start time:                        2014-04-22 10:02:02 PDT
    Uptime:                            1 hour, 23 minutes, 24 seconds
    Max Power Consumption          608 Watts
  Slot 8 information:
    State                              Online
    Temperature                     36
    Total CPU DRAM                3584 MB
    Total XR2                      291 MB
    Total DDR DRAM                24960 MB
    Start time:                        2014-04-22 10:02:07 PDT
    Uptime:                            1 hour, 23 minutes, 19 seconds
    Max Power Consumption          607 Watts
  Slot 9 information:
    State                              Online
    Temperature                     31
    Total CPU DRAM                2048 MB
    Total RLDRAM                   734 MB
    Total DDR DRAM                3108 MB
    Start time:                        2014-04-22 10:02:05 PDT
    Uptime:                            1 hour, 23 minutes, 21 seconds
    Max Power Consumption          368 Watts
  Slot 10 information:
    State                              Online
    Temperature                     35
```



```
  Total CPU DRAM                  3584 MB
  Total XR2                        291 MB
  Total DDR DRAM                 24960 MB
  Start time:                          2014-04-22 10:02:11 PDT
  Uptime:                              1 hour, 23 minutes, 15 seconds
  Max Power Consumption            607 Watts
Slot 11 information:
  State                                Online
  Temperature                       33
  Total CPU DRAM                  2048 MB
  Total RLDRAM                    1036 MB
  Total DDR DRAM                 11264 MB
  Start time:                          2014-04-22 10:02:16 PDT
  Uptime:                              1 hour, 23 minutes, 10 seconds
  Max Power Consumption            608 Watts
```

show chassis fpc pic-status(MX960 Router with MPC5EQ)

```
user@host> show chassis fpc pic-status
Slot 0   Online       MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online       2X10GE SFPP OTN
  PIC 1  Online       1X100GE CFP2 OTN
  PIC 2  Online       2X10GE SFPP OTN
  PIC 3  Online       1X100GE CFP2 OTN
Slot 1   Online       MPCE Type 3 3D
  PIC 0  Online       10X10GE SFPP
  PIC 2  Online       1X100GE CXP
Slot 3   Online       MPC 3D 16x 10GE
  PIC 0  Online       4x 10GE(LAN) SFP+
  PIC 1  Online       4x 10GE(LAN) SFP+
  PIC 2  Online       4x 10GE(LAN) SFP+
  PIC 3  Online       4x 10GE(LAN) SFP+
Slot 4   Online       MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online       2X10GE SFPP OTN
  PIC 1  Online       1X100GE CFP2 OTN
  PIC 2  Online       2X10GE SFPP OTN
  PIC 3  Online       1X100GE CFP2 OTN
Slot 5   Online       MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online       2X10GE SFPP OTN
  PIC 1  Online       1X100GE CFP2 OTN
  PIC 2  Online       2X10GE SFPP OTN
  PIC 3  Online       1X100GE CFP2 OTN
Slot 7   Online       MPC4E 3D 2CGE+8XGE
  PIC 0  Online       4x10GE SFPP
  PIC 1  Online       1X100GE CFP
  PIC 2  Online       4x10GE SFPP
  PIC 3  Online       1X100GE CFP
Slot 8   Online       MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Offline      12X10GE SFPP OTN
  PIC 1  Offline      12X10GE SFPP OTN
  PIC 2  Online       3X40GE QSFPP
  PIC 3  Online       3X40GE QSFPP
Slot 9   Online       MPCE Type 2 3D P
  PIC 0  Online       2x 10GE  XFP
  PIC 1  Online       2x 10GE  XFP
Slot 10  Online       MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Online       12X10GE SFPP
  PIC 1  Online       12X10GE SFPP
  PIC 2  Offline      3X40GE QSFPP
  PIC 3  Offline      3X40GE QSFPP
```

```
Slot 11  Online       MPC4E 3D 2CGE+8XGE
  PIC 0  Online       4x10GE SFPP
  PIC 1  Online       1X100GE CFP
  PIC 2  Online       4x10GE SFPP
  PIC 3  Online       1X100GE CFP
```

show chassis fpc (MX240, MX480, MX960 Routers with Application Services Modular Line Card

```
user@host> show chassis fpc 1
    Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  1  Online            34      5          0       3072         5         13
```

show chassis fpc (MX240, MX480, MX960 with Application Services Modular Line Card

```
user@host> show chassis fpc 1 detail
Slot 1 information:
  State                               Online
  Temperature                      34
  Total CPU DRAM                 3072 MB
  Total RLDRAM                    259 MB
  Total DDR DRAM                 4864 MB
  Start time:                         2012-06-19 10:51:43 PDT
  Uptime:                             16 minutes, 48 seconds
  Max Power Consumption           550 Watts
```

show chassis fpc (MX2010 Routers)

```
user@host> show chassis fpc
     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online            34      9          0       2048        18         13
  1  Online            32      9          0       2048        15         13
  2  Empty
  3  Empty
  4  Empty
  5  Empty
  6  Empty
  7  Empty
  8  Online            31     13          0       2048        11         13
  9  Online            33     10          0       2048        18         13
```

show chassis fpc (MX2020 Routers)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online            10     12          0       2048        18         13
  1  Online             8      9          0       2048        18         13
  2  Online             7      9          0       2048        18         13
  3  Online             8     10          0       2048        18         13
  4  Online             9     10          0       2048        18         13
  5  Online             8      9          0       2048        18         13
  6  Online             8     10          0       2048        18         13
  7  Online             9      9          0       2048        18         13
  8  Online             9     10          0       2048        18         13
  9  Online            10      9          0       2048        18         13
 10  Online            16      8          0       2048        18         13
 11  Online            11     10          0       2048        18         13
 12  Online            10     10          0       2048        18         13
 13  Online            11      9          0       2048        18         13
```

```
 14  Online            12     10          0       2048       18          13
 15  Online            13      9          0       2048       18          13
 16  Online            13      9          0       2048       18          13
 17  Online            12      9          0       2048       18          13
 18  Online            12      8          0       2048       18          13
 19  Online            14     10          0       2048       18          13
```

show chassis fpc (MX2020 Router with MPC4E)

```
user@host> show chassis fpc
     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online            33     12          2       2048       11          13
  1  Empty
  2  Empty
  3  Empty
  4  Empty
  5  Empty
  6  Empty
  7  Empty
  8  Empty
  9  Online            31     10          0       2048       11          13
 10  Online            32      7          0       2048       14          13
 11  Empty
 12  Empty
 13  Empty
 14  Online            28     12          0       2048       15          14
 15  Empty
 16  Empty
 17  Empty
 18  Empty
 19  Online            38      8          0       2048       18          13
```

show chassis fpc detail (MX2020 Router with MPC4E)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                                  Online
  Temperature                         34
  Total CPU DRAM                    2048 MB
  Total RLDRAM                       806 MB
  Total DDR DRAM                    2632 MB
  Start time:                            2013-02-17 08:17:35 PST
  Uptime:                                1 day, 14 hours, 50 minutes, 39 seconds
  Max Power Consumption              368 Watts
Slot 9 information:
  State                                  Online
  Temperature                         32
  Total CPU DRAM                    2048 MB
  Total RLDRAM                       806 MB
  Total DDR DRAM                    2632 MB
  Start time:                            2013-02-17 08:17:43 PST
  Uptime:                                1 day, 14 hours, 50 minutes, 31 seconds
  Max Power Consumption              368 Watts
Slot 10 information:
  State                                  Online
  Temperature                         37
  Total CPU DRAM                    2048 MB
  Total RLDRAM                      1036 MB
  Total DDR DRAM                    6656 MB
  Start time:                            2013-02-17 08:17:54 PST
```



```
  Uptime:                              1 day, 14 hours, 50 minutes, 20 seconds
  Max Power Consumption            520 Watts
Slot 14 information:
  State                                Online
  Temperature                        32
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1036 MB
  Total DDR DRAM                   11264 MB
  Start time:                          2013-02-17 08:18:01 PST
  Uptime:                              1 day, 14 hours, 50 minutes, 13 seconds
  Max Power Consumption            610 Watts
Slot 19 information:
  State                                Online
  Temperature                        38
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1324 MB
  Total DDR DRAM                   5120 MB
  Start time:                          2013-02-17 08:18:08 PST
  Uptime:                              1 day, 14 hours, 50 minutes, 6 seconds
  Max Power Consumption            440 Watts
```

show chassis fpc (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online            31     20          0       3584        7         13
  1  Online            28     19          0       2048       17         13
  2  Online            27     10          0       2048       18         14
  3  Online            26     10          0       2048       13         13
  4  Online            29     19          0       3584        7         13
  5  Online            28     68          0       2048       20         13
  6  Empty
  7  Empty
  8  Empty
  9  Online            36     19          0       3584       10         13
 10  Online            37     26          0       3584       10         13
 11  Empty
 12  Empty
 13  Empty
 14  Empty
 15  Empty
 16  Empty
 17  Online            28     43          0       3584       10         13
 18  Online            29     19          0       3584        7         13
 19  Online            31     19          0       3584        7         13
```

show chassis fpc detail (MX2020 Router with MPCEQ and MPC6E)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                                Online
  Temperature                        31
  Total CPU DRAM                   3584 MB
  Total XR2                         291 MB
  Total DDR DRAM                   24960 MB
  Start time:                          2014-04-22 23:33:19 PDT
  Uptime:                              6 minutes, 24 seconds
  Max Power Consumption            607 Watts
Slot 1 information:
```



```
  State                              Online
  Temperature                     28
  Total CPU DRAM                2048 MB
  Total RLDRAM                  1036 MB
  Total DDR DRAM                6656 MB
  Start time:                        2014-04-22 23:33:24 PDT
  Uptime:                            6 minutes, 19 seconds
  Max Power Consumption          520 Watts
Slot 2 information:
  State                              Online
  Temperature                     27
  Total CPU DRAM                2048 MB
  Total RLDRAM                  1036 MB
  Total DDR DRAM                11264 MB
  Start time:                        2014-04-22 23:33:34 PDT
  Uptime:                            6 minutes, 9 seconds
  Max Power Consumption          608 Watts
Slot 3 information:
  State                              Online
  Temperature                     26
  Total CPU DRAM                2048 MB
  Total RLDRAM                   734 MB
  Total DDR DRAM                3108 MB
  Start time:                        2014-04-22 23:33:39 PDT
  Uptime:                            6 minutes, 4 seconds
  Max Power Consumption          368 Watts
Slot 4 information:
  State                              Online
  Temperature                     29
  Total CPU DRAM                3584 MB
  Total XR2                      291 MB
  Total DDR DRAM                24960 MB
  Start time:                        2014-04-22 23:33:51 PDT
  Uptime:                            5 minutes, 52 seconds
  Max Power Consumption          607 Watts
Slot 5 information:
  State                              Online
  Temperature                     28
  Total CPU DRAM                2048 MB
  Total RLDRAM                  1324 MB
  Total DDR DRAM                5120 MB
  Start time:                        2014-04-22 23:33:57 PDT
  Uptime:                            5 minutes, 46 seconds
  Max Power Consumption          440 Watts
Slot 9 information:
  State                              Online
 Temperature                     25
  Total CPU DRAM                3584 MB
  Total XR2                      518 MB
  Total DDR DRAM                49920 MB
  Start time:                        2014-04-22 23:31:20 PDT
  Uptime:                            8 minutes, 23 seconds
  Max Power Consumption         1130 Watts
Slot 10 information:
  State                              Online
  Temperature                     32
  Total CPU DRAM                3584 MB
  Total XR2                      518 MB
  Total DDR DRAM                49920 MB
  Start time:                        2014-04-22 23:31:25 PDT
  Uptime:                            8 minutes, 18 seconds
```



```
  Max Power Consumption            1130 Watts
Slot 17 information:
  State                                 Online
  Temperature                        25
  Total CPU DRAM                   3584 MB
  Total XR2                         518 MB
  Total DDR DRAM                  49920 MB
  Start time:                           2014-04-22 23:31:29 PDT
  Uptime:                               8 minutes, 14 seconds
  Max Power Consumption            1130 Watts
Slot 18 information:
  State                                 Online
  Temperature                        29
  Total CPU DRAM                   3584 MB
  Total XR2                         291 MB
  Total DDR DRAM                  24960 MB
  Start time:                           2014-04-22 23:34:11 PDT
  Uptime:                               5 minutes, 32 seconds
  Max Power Consumption             607 Watts
Slot 19 information:
  State                                 Online
  Temperature                        32
  Total CPU DRAM                   3584 MB
  Total XR2                         291 MB
  Total DDR DRAM                  24960 MB
  Start time:                           2014-04-22 23:34:20 PDT
  Uptime:                               5 minutes, 23 seconds
  Max Power Consumption             607 Watts
```

show chassis fpc pic-status (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis fpc pic-status
Slot 0   Online       MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Online       12X10GE SFPP OTN
  PIC 1  Online       12X10GE SFPP OTN
  PIC 2  Offline      3X40GE QSFPP
  PIC 3  Offline      3X40GE QSFPP
Slot 1   Online       MPCE Type 3 3D
  PIC 0  Online       10X10GE SFPP
  PIC 2  Online       1X100GE CXP
Slot 2   Online       MPC4E 3D 2CGE+8XGE
  PIC 0  Online       4x10GE SFPP
  PIC 1  Online       1X100GE CFP
  PIC 2  Online       4x10GE SFPP
  PIC 3  Online       1X100GE CFP
Slot 3   Online       MPCE Type 2 3D P
  PIC 0  Online       2x 10GE  XFP
  PIC 1  Online       2x 10GE  XFP
Slot 4   Online       MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online       2X10GE SFPP OTN
  PIC 1  Online       1X100GE CFP2 OTN
  PIC 2  Online       2X10GE SFPP OTN
  PIC 3  Online       1X100GE CFP2 OTN
Slot 5   Online       MPC 3D 16x 10GE
  PIC 0  Online       4x 10GE(LAN) SFP+
  PIC 1  Online       4x 10GE(LAN) SFP+
  PIC 2  Online       4x 10GE(LAN) SFP+
  PIC 3  Online       4x 10GE(LAN) SFP+
Slot 9   Online       MPC6E 3D
  PIC 0  Online       2X100GE CFP2 OTN
  PIC 1  Online       2X100GE CFP2 OTN
```

```
Slot 10   Online       MPC6E 3D
  PIC 0   Online       24X10GE SFPP OTN
  PIC 1   Online       4X100GE CXP
Slot 17   Online       MPC6E 3D
  PIC 0   Online       24X10GE SFPP
  PIC 1   Online       4X100GE CXP
Slot 18   Online       MPC5E 3D Q 24XGE+6XLGE
  PIC 0   Offline      12X10GE SFPP OTN
  PIC 1   Offline      12X10GE SFPP OTN
  PIC 2   Online       3X40GE QSFPP
  PIC 3   Online       3X40GE QSFPP
Slot 19   Online       MPC5E 3D Q 24XGE+6XLGE
  PIC 0   Online       12X10GE SFPP OTN
  PIC 1   Offline      12X10GE SFPP OTN
  PIC 2   Offline      3X40GE QSFPP
  PIC 3   Online       3X40GE QSFPP
```

show chassis fpc detail (MX Series Routers)

```
user@host> show chassis fpc detail 2
Slot 0 information:
  State                              Online
  Temperature                     36 degrees C / 96 degrees F
  Total CPU DRAM                1024 MB
  Total RLDRAM                   256 MB
  Total DDR DRAM                4096 MB
  Start time:                        2009-08-11 21:20:30 PDT
  Uptime:                            2 hours, 8 minutes, 50 seconds
  Max Power Consumption          335 Watts
```

show chassis fpc detail (EX Series Switches)

```
user@host> show chassis fpc detail 2
Slot 1 information:
  State                              Online
  Temperature                     41
  Total CPU DRAM                2048 MB
  Total RLDRAM                  1036 MB
  Total DDR DRAM                11264 MB
  Start time:                        2013-04-02 00:04:52 PDT
  Uptime:                            7 days, 9 hours, 47 minutes, 46 seconds
  Max Power Consumption          610 Watts
Slot 2 information:
  State                              Online
  Temperature                     41
  Total CPU DRAM                2048 MB
  Total RLDRAM                  1036 MB
  Total DDR DRAM                11264 MB
  Start time:                        2013-04-02 00:04:56 PDT
  Uptime:                            7 days, 9 hours, 47 minutes, 42 seconds
  Max Power Consumption          610 Watts
```

show chassis fpc (Hardware Not Supported)

```
user@host> show chassis fpc
show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
 Slot State           (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online          -------------------- CPU less FPC --------------------
  1  Present         ------ Hardware Not In Right Slot ------
  2  Online                  0          0          0         0          0
  3  Present         ------ Hardware Not Supported ------
```

```
  4   Empty
  5   Empty
  6   Online                   0          0         0         0          0
```

show chassis fpc detail (Hardware Not Supported)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                                 Online
  Total CPU DRAM                        ---- CPU less FPC ----
  Start time                            2006-07-07 03:21:00 UTC
  Uptime                                27 minutes, 51 seconds
 Slot 1 information:
  State                                 Present
  Reason                                --- Hardware Not In Right Slot ---
 Slot 2 information:
  State                                 Online
  Total CPU DRAM                     32 MB
  Start time                            2006-07-07 03:20:59 UTC
  Uptime                                27 minutes, 52 seconds
 Slot 3 information:
  State                                 Present
  Reason                                --- Hardware Not Supported ---
  Total CPU DRAM                      0 MB
 Slot 6 information:
  State                                 Online
  Total CPU DRAM                     32 MB
  Start time                            2006-07-07 03:21:01 UTC
  Uptime                                27 minutes, 50 seconds
```

show chassis fpc pic-status

```
user@host> show chassis fpc pic-status
Slot 0 Online
  PIC 1     1x OC-12 ATM, MM
  PIC 2     1x OC-12 ATM, MM
  PIC 3     1x OC-12 ATM, MM
Slot 1 Online
  PIC 0     1x OC-48 SONET, SMIR
Slot 2 Online
  PIC 0     1x OC-192 SONET, SMSR
```

show chassis fpc pic-status (M Series Routers)

```
user@host> show chassis fpc pic-status
Slot 1   Online       FPC Type 1
  PIC 0  Present      2x OC-3 ATM, MM- Hardware Error
  PIC 1  Online       4x OC-3 SONET, SMIR
Slot 2   Online       E-FPC Type 2
  PIC 0  Online       4x G/E, 1000 BASE-SX
  PIC 1  Online       2x G/E SFP, 1000 BASE
  PIC 3  Online       1x Tunnel
Slot 3   Online       E-FPC Type 1
  PIC 0  Online       1x G/E IQ, 1000 BASE
  PIC 2  Online       1x G/E SFP, 1000 BASE
Slot 4   Online       E-FPC Type 2
  PIC 0  Online       4x G/E SFP, 1000 BASE
  PIC 1  Online       4x G/E SFP, 1000 BASE
  PIC 2  Online       4x G/E SFP, 1000 BASE
  PIC 3  Online       4x G/E SFP, 1000 BASE
```



```
Slot 5   Online       FPC Type 2
...
```

show chassis fpc pic-status (M120 Router)

```
user@host> show chassis fpc pic-status
Slot 1   Online       M120 CFPC 10GE
  PIC 0  Online       1x 10GE(LAN/WAN) XFP
Slot 3   Online       M120 FPC Type 2 (proto)
  PIC 0  Online       2x G/E IQ, 1000 BASE
  PIC 1  Online       4x OC-3 SONET, SMIR
  PIC 2  Online       2x G/E IQ, 1000 BASE
  PIC 3  Online       8x 1GE(LAN), IQ2
Slot 4   Online       M120 FPC Type 3 (proto)
  PIC 0  Online       10x 1GE(LAN), 1000 BASE
Slot 5   Online       M120 FPC Type 1 (proto)
  PIC 0  Present      1x G/E, 1000 BASE-LX- Not Supported
  PIC 1  Online       1x CHOC3 IQ SONET, SMLR
  PIC 2  Online       4x CHDS3 IQ
  PIC 3  Online       1x G/E SFP, 1000 BASE
```

show chassis fpc pic-status (MX240, MX480, and MX960 Routers with Application Services Modular Line Card)

In the following output **Slot 1 and Slot 5** are the Application Services Modular Carrier Cards (AS MCC), **PIC 0** is the Application Services Modular Storage Card (AS MSC), and **PIC 2** is the Application Services Modular Processing Card (AS MXC).

```
user@host>show chassis fpc pic-status
Slot 2   Online       MPC Type 1 3D Q
  Slot 1   Online       AS-MCC
  PIC 0  Online       AS-MSC
  PIC 2  Online       AS-MXC
Slot 4   Offline      MPC 3D 16x 10GE
Slot 5   Offline      AS-MCC
```

show chassis fpc lcc (TX Matrix Router)

```
user@host> show chassis fpc lcc 0
lcc0-re0:
--------------------------------------------------------------------------
                     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 <fpc-slot> (EX Series Switch)

user@host> **show chassis fpc 2**

```
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap      Buffer
  2  Online            40     12          0       2048        19         14
```

show chassis fpc slot (T1600 Router)

user@host> **show chassis fpc slot 2**

```
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap      Buffer
  2  Online            49      3          0       2048         3         24
```

show chassis fpc pic-status (T1600 Router)

user@host> **show chassis fpc pic-status**

```
Slot 2   Online       FPC Type 1-ES
  PIC 0  Online       Load Type 1
  PIC 1  Online       4x 1GE(LAN), IQ2E
  PIC 3  Online       1x OC-12-3 SFP
Slot 3   Online       FPC Type 4-ES
  PIC 0  Online       4x 10GE (LAN/WAN) XFP
  PIC 1  Online       4x OC-192 SONET XFP
```

```
Slot 5    Online        FPC Type 2-ES
  PIC 0   Online        Load Type 2
  PIC 1   Online        8x 1GE(LAN), IQ2E
  PIC 2   Online        8x 1GE(LAN), IQ2E
  PIC 3   Online        1x OC-48-12-3 SFP
Slot 7    Online        FPC Type 4
  PIC 0   Online        4x 10GE (LAN/WAN) XFP
```

show chassis fpc (T4000 Router)

```
user@host> show chassis fpc

                    Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State           (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online          48     15          0        2816        21        27
  1  Empty
  2  Empty
  3  Online          51     15          0        2816        21        27
  4  Empty
  5  Online          39      8          0        2048         6        23
  6  Online          49     15          0        2816        21        27
  7  Empty
```

show chassis fpc detail (T4000 Router)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                                 Online
  Temperature                        48 degrees C / 118 degrees F
  Total CPU DRAM                   2816 MB
  Total SRAM                       1554 MB
  Total SDRAM                      10752 MB
  Start time                            2012-02-09 22:56:25 PST
  Uptime                                2 hours, 40 minutes, 52 seconds
Slot 3 information:
  State                                 Online
  Temperature                        51 degrees C / 123 degrees F
  Total CPU DRAM                   2816 MB
  Total SRAM                       1554 MB
  Total SDRAM                      10752 MB
  Start time                            2012-02-09 22:56:22 PST
  Uptime                                2 hours, 40 minutes, 55 seconds
Slot 5 information:
  State                                 Online
  Temperature                        39 degrees C / 102 degrees F
  Total CPU DRAM                   2048 MB
  Total SRAM                        128 MB
  Total SDRAM                      2560 MB
  Start time                            2012-02-09 22:51:27 PST
  Uptime                                2 hours, 45 minutes, 50 seconds
Slot 6 information:
  State                                 Online
  Temperature                        49 degrees C / 120 degrees F
  Total CPU DRAM                   2816 MB
  Total SRAM                       1554 MB
  Total SDRAM                      10752 MB
  Start time                            2012-02-09 22:56:29 PST
  Uptime                                2 hours, 40 minutes, 48 seconds
```

show chassis fpc pic-status (T4000 Router)

```
user@host> show chassis fpc pic-status
Slot 0   Online        FPC Type 5-3D
  PIC 0  Online        12x10GE (LAN/WAN) SFPP
  PIC 1  Online        12x10GE (LAN/WAN) SFPP
Slot 3   Online        FPC Type 5-3D
  PIC 0  Online        1x100GE
  PIC 1  Online        12x10GE (LAN/WAN) SFPP
Slot 5   Online        FPC Type 4-ES
  PIC 0  Online        100GE
  PIC 1  Online        100GE CFP
Slot 6   Online        FPC Type 5-3D
  PIC 0  Online        12x10GE (LAN/WAN) SFPP
  PIC 1  Online        12x10GE (LAN/WAN) SFPP
```

show chassis fpc (QFX Series and OCX Series)

```
user@switch> show chassis fpc
Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
0  Online            26      2          0       2820         0        49
```

show chassis fpc detail (QFX3500 Switches)

```
user@switch> show chassis fpc detail
Slot 0 information:
  State                                Online
  Temperature                       28 degrees C / 82 degrees F
  Total CPU DRAM                  2820 MB
  Total SRAM                         0 MB
  Total SDRAM                        0 MB
  Start time                           2010-09-20 01:34:13 PDT
  Uptime                               3 days, 3 hours, 31 minutes, 48 seconds
```

show chassis fpc pic-status (QFX3500 Switches)

```
user@switch> show chassis fpc pic-status
Slot 0   Online        QFX 48x10G 4x40G Switch
  PIC 0  Online        48x 10G-SFP+
  PIC 1  Online        15x 10G-SFP+
```

show chassis fpc interconnect-device (QFabric System)

```
user@switch> show chassis fpc interconnect-device interconnect1
FPC status:
                     Temp
Slot State            (C)
  0  Online             0
  1  Online             0
  2  Online             0
  3  Online             0
  4  Online             0
  5  Online             0
  6  Online             0
  7  Online             0
  8  Online             0
  9  Online             0
 10  Online             0
 11  Online             0
 12  Online             0
```

```
 13  Online              0
 14  Online              0
 15  Online              0
```

show chassis fpc interconnect-device (QFabric System)

```
user@switch> show chassis fpc interconnect-device interconnect1 3
FPC status:
                     Temp
Slot State            (C)
  3  Online             0
```

show chassis fpc interconnect-device detail (QFabric System)

```
user@switch> show chassis fpc interconnect-device interconnect1 3 detail
Slot 3 information:
  State                              Online
  Temperature                     0 degrees C / 32 degrees F
  Start time                         2011-08-18 10:45:04 PDT
  Uptime                             1 minute, 49 seconds
```

show chassis fpc pic-status interconnect-device (QFabric System)

```
user@switch> show chassis fpc pic-status interconnect-device interconnect1
Slot 0    Online        QFX 16-port QSFP+ Front Card
  PIC 0   Online        16x 40G-QSFP+
  PIC 1   Online        16x 40G-GE
Slot 1    Online        QFX 16-port QSFP+ Front Card
  PIC 0   Online        16x 40G-QSFP+
 PIC 1  Online        16x 40G-GE
Slot 2    Online        QFX 16-port QSFP+ Front Card
  PIC 0   Online        16x 40G-QSFP+
  PIC 1   Online        16x 40G-GE
Slot 3    Online        QFX 16-port QSFP+ Front Card
  PIC 0   Online        16x 40G-QSFP+
  PIC 1   Online        16x 40G-GE
Slot 4    Online        QFX 16-port QSFP+ Front Card
  PIC 0   Online        16x 40G-QSFP+
  PIC 1   Online        16x 40G-GE
Slot 5    Online        QFX 16-port QSFP+ Front Card
  PIC 0   Online        16x 40G-QSFP+
  PIC 1   Online        16x 40G-GE
Slot 6    Online        QFX 16-port QSFP+ Front Card
  PIC 0   Online        16x 40G-QSFP+
  PIC 1   Online        16x 40G-GE
Slot 7    Online        QFX 16-port QSFP+ Front Card
  PIC 0   Online        16x 40G-QSFP+
  PIC 1   Online        16x 40G-GE
Slot 8    Online        QFX Fabric Rear Card
  PIC 0   Online        16x 40G-GE
Slot 9    Online        QFX Fabric Rear Card
  PIC 0   Online        16x 40G-GE
Slot 10   Online        QFX Fabric Rear Card
  PIC 0   Online        16x 40G-GE
Slot 11   Online        QFX Fabric Rear Card
  PIC 0   Online        16x 40G-GE
Slot 12   Online        QFX Fabric Rear Card
  PIC 0   Online        16x 40G-GE
Slot 13   Online        QFX Fabric Rear Card
  PIC 0   Online        16x 40G-GE
Slot 14   Online        QFX Fabric Rear Card
  PIC 0   Online        16x 40G-GE
```



```
Slot 15  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
```

show chassis fpc pic-status node-device (QFabric System)

```
user@switch> show chassis fpc pic-status node-device node1
Slot node1 Online      QFX 48x10G 4x40G Switch
  PIC 0  Online       48x 10G-SFP+
  PIC 1  Online       4x 40G-QSFP+
```

show chassis fpc (PTX5000 Packet Transport Router)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Empty
  1  Empty
  2  Online            50      6          0       2816        5         27
  3  Empty
  4  Empty
  5  Online            48      9          0       2816        5         27
  6  Empty
  7  Online            49      8          0       2816        5         27
```

show chassis fpc detail (PTX5000 Packet Transport Router)

```
user@host> show chassis fpc detail
Slot 2 information:
  State                               Online
  Temperature                      35 degrees C / 95 degrees F (PMB)
  Temperature                      35 degrees C / 95 degrees F (Intake)
  Temperature                      50 degrees C / 122 degrees F (Exhaust A)
  Temperature                      54 degrees C / 129 degrees F (Exhaust B)
  Temperature                      54 degrees C / 129 degrees F (TL0)
  Temperature                      52 degrees C / 125 degrees F (TQ0)
  Temperature                      61 degrees C / 141 degrees F (TL1)
  Temperature                      58 degrees C / 136 degrees F (TQ1)
  Temperature                      57 degrees C / 134 degrees F (TL2)
  Temperature                      58 degrees C / 136 degrees F (TQ2)
  Temperature                      62 degrees C / 143 degrees F (TL3)
  Temperature                      61 degrees C / 141 degrees F (TQ3)
  Total CPU DRAM                 2816 MB
  Total SRAM                        0 MB
  Total SDRAM                       0 MB
  Start time                          2012-01-12 12:05:42 PST
  Uptime                              3 hours, 14 minutes, 7 seconds
Slot 5 information:
  State                               Online
  Temperature                      35 degrees C / 95 degrees F (PMB)
  Temperature                      34 degrees C / 93 degrees F (Intake)
  Temperature                      48 degrees C / 118 degrees F (Exhaust A)
  Temperature                      53 degrees C / 127 degrees F (Exhaust B)
  Temperature                      54 degrees C / 129 degrees F (TL0)
  Temperature                      52 degrees C / 125 degrees F (TQ0)
  Temperature                      69 degrees C / 156 degrees F (TL1)
  Temperature                      56 degrees C / 132 degrees F (TQ1)
  Temperature                      54 degrees C / 129 degrees F (TL2)
  Temperature                      56 degrees C / 132 degrees F (TQ2)
  Temperature                      59 degrees C / 138 degrees F (TL3)
  Temperature                      60 degrees C / 140 degrees F (TQ3)
  Total CPU DRAM                 2816 MB
```



```
  Total SRAM                        0 MB
  Total SDRAM                       0 MB
  Start time                          2012-01-12 12:05:43 PST
  Uptime                              3 hours, 14 minutes, 6 seconds
Slot 7 information:
  State                               Online
  Temperature                      35 degrees C / 95 degrees F (PMB)
  Temperature                      33 degrees C / 91 degrees F (Intake)
  Temperature                      50 degrees C / 122 degrees F (Exhaust A)
  Temperature                      55 degrees C / 131 degrees F (Exhaust B)
  Temperature                      56 degrees C / 132 degrees F (TL0)
  Temperature                      56 degrees C / 132 degrees F (TQ0)
  Temperature                      61 degrees C / 141 degrees F (TL1)
  Temperature                      57 degrees C / 134 degrees F (TQ1)
  Temperature                      55 degrees C / 131 degrees F (TL2)
  Temperature                      59 degrees C / 138 degrees F (TQ2)
  Temperature                      62 degrees C / 143 degrees F (TL3)
  Temperature                      62 degrees C / 143 degrees F (TQ3)
  Total CPU DRAM                 2816 MB
  Total SRAM                        0 MB
  Total SDRAM                       0 MB
  Start time                          2012-01-12 12:05:44 PST
  Uptime                              3 hours, 14 minutes, 5 seconds
```

show chassis fpc pic-status (PTX5000 Packet Transport Router)

```
user@host> show chassis fpc pic-status
Slot 2   Online       FPC
  PIC 0  Online       24x 10GE(LAN) SFP+
  PIC 1  Online       24x 10GE(LAN) SFP+
Slot 5   Online       FPC
  PIC 0  Online       24x 10GE(LAN) SFP+
  PIC 1  Online       2x 40GE CFP
Slot 7   Online       FPC
  PIC 0  Online       24x 10GE(LAN) SFP+
  PIC 1  Online       2x 40GE CFP
```

show chassis fpc (ACX2000 Universal Access Router)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online            61     17          6       512        21         37
```

show chassis fpc 0 (ACX2000 Universal Access Router)

```
user@host> show chassis fpc 0
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online            61     17          6       512        21         37
```

show chassis fpc detail (ACX2000 Universal Access Router)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                               Online
  Temperature                      61 degrees C / 141 degrees F
  Total CPU DRAM                  512 MB
  Start time                          2012-05-29 02:52:06 PDT
  Uptime                              27 minutes, 17 seconds
```

show chassis fpc pic-status (ACX2000 Universal Access Router)

```
user@host> show chassis fpc pic-status
Slot 0   Online
  PIC 0  Online       16x CHE1T1, RJ48
  PIC 1  Online       8x 1GE(LAN) RJ45
  PIC 2  Online       2x 1GE(LAN) SFP
  PIC 3  Online       2x 10GE(LAN) SFP+
```

show chassis FPC 1 (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis fpc 1
                  Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State         (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  1  Online         34      5          0       3072         5        13
```

show chassis FPC 1 detail (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis fpc 1 detail
Slot 1 information:
  State                               Online
  Temperature                      34
  Total CPU DRAM                 3072 MB
  Total RLDRAM                    259 MB
  Total DDR DRAM                 4864 MB
  Start time:                         2012-06-19 10:51:43 PDT
  Uptime:                             16 minutes, 48 seconds
  Max Power Consumption           550 Watts
```


show chassis fpc-feb-connectivity

Syntax show chassis fpc-feb-connectivity

Release Information Command introduced in Junos OS Release 8.0.

Description (M120 router only) Display the Flexible PIC Concentrator (FPC) and Forwarding Engine Board (FEB) mapping and their respective states.

Options This command has no options.

Required Privilege Level view

Related Documentation

- request chassis fpc on page 631
- show chassis fpc on page 1212
- show chassis fabric fpcs on page 1021
- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 289
- *MX960 Flexible PIC Concentrator Description*

List of Sample Output show chassis fpc-feb-connectivity on page 1251

Output Fields Table 88 on page 1250 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 88: show chassis fpc-feb-connectivity Output Fields

Field Name	Field Description
FPC	Slot number of the Flexible PIC Concentrator (FPC).
FPC type	Type of FPC: **Type 1**, **Type 2**, **Type 3**, or **cFPC**.
FPC state	State of the FPC. State can be any of the following: • **Announce offline**—Intermediate state where FPC is going down but is not offline and the Chassis manager acknowledges that the FPC is in the process of going offline. • **Announce online**—Intermediate state where FPC is coming up but is not online and the Chassis manager acknowledges that the FPC is in the process of coming online. • **Empty**—No FPC is present. • **Offline**—FPC is powered down. • **Online**—FPC is online and running. • **Present**—The chassis process has detected the FPC, but the FPC is either not supported by the current version of the Junos OS or FPC is coming up but is not online. • **Ready**—FPC is in transition state.
Connected FEB	Slot number of the Forwarding Engine Board (FEB) connected to the FPC or **None** if the FPC is not connected to a FEB.

Table 88: show chassis fpc-feb-connectivity Output Fields *(continued)*

Field Name	Field Description
FEB state	State of the FEB. State can be any of the following: • **Announce offline**—Intermediate state where FEB is going down but is not offline and the Chassis manager acknowledges that the FEB is in the process of going offline. • **Announce online**—Intermediate state where FEB is coming up but is not online and the Chassis manager acknowledges that the FEB is in the process of coming online. • **Empty**—No FEB is present. • **Offline**—FEB is powered down. • **Online**—FEB is online and running. • **Present**—The chassis process has detected the FEB, but the FEB is either not supported by the current version of the Junos OS or FEB is coming up but is not online. • **Ready**—FEB is in transition state.
Link status	Status of the link connecting the R-FEB and R-FPC: • **Error** • **Misconfiguration**—Configuration between the R-FEB and the F-FPC is incorrect. • **OK**

Sample Output

show chassis fpc-feb-connectivity

```
user@host> show chassis fpc-feb-connectivity

FPC  FPC type  FPC state       Connected FEB  FEB state       Link status
0    cFPC      Online          0              Empty
1    cFPC      Online          1              Online          OK
2    Type 3    Online          3              Online          OK
3    Type 2    Online          None
4    Type 1    Online          4              Online          OK
5    Type 3    Online          None
    FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
  Egress queues: 8 supported, 8 in use
  Queue counters:       Queued packets  Transmitted packets      Dropped packets

    0 best-effort                    0                    0                    0

    1 expedited-fo                   0                    0                    0

    2 assured-forw                   0                    0                    0

    3 network-cont                   0                    0                    0

  Active alarms  : PLL, LOS, LINK
  Active defects : PLL, LOF, LOS, SEF, LOP, BERR-SF, PLM-P, LINK
  PCS statistics                      Seconds
    Bit errors                             0
    Errored blocks                         3
  MAC statistics:                      Receive         Transmit
    Total octets                             0                0
    Total packets                            0                0
```

show chassis hardware

List of Syntax

Syntax on page 1253
Syntax (EX Series) on page 1253
Syntax (T4000 Router) on page 1253
Syntax (TX Matrix Router) on page 1253
Syntax (TX Matrix Plus Router) on page 1253
Syntax (MX Series Routers) on page 1253
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 1253
Syntax (QFX Series) on page 1254
Syntax (OCX Series) on page 1254
Syntax (PTX Series Packet Transport Routers) on page 1254
Syntax (ACX Series Universal Access Routers) on page 1254

Syntax

show chassis hardware
<detail | extensive>
<clei-models>
<models>

Syntax (EX Series)

show chassis hardware
<clei-models>
<detail | extensive>
<models>

Syntax (T4000 Router)

show chassis hardware
<clei-models>
<detail | extensive>
<models>

Syntax (TX Matrix Router)

show chassis hardware
<clei-models>
<detail | extensive>
<models>
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show chassis hardware
<clei-models>
<detail | extensive>
<models>
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis hardware
<detail | extensive>
<clei-models>
<models>
<all-members>
<local>
<member *member-id*>

Syntax (MX104, MX2010, and MX2020

show chassis hardware
<clei-models>
<detail | extensive>

3D Universal Edge Routers)

<models>

Syntax (QFX Series)

```
show chassis hardware
<detail | extensive>
<clei-models>
<interconnect-device name>
<node-device name>
<models>
```

Syntax (OCX Series)

```
show chassis hardware
<detail | extensive>
<clei-models>
<models>
```

Syntax (PTX Series Packet Transport Routers)

```
show chassis hardware
<detail | extensive>
<clei-models>
<models>
```

Syntax (ACX Series Universal Access Routers)

```
show chassis hardware
<detail | extensive>
<clei-models>
<models>
```

Release Information

Command introduced before Junos OS Release 7.4.
models option introduced in Junos OS Release 8.2.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 11.1 for QFX Series.
Command introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display a list of all Flexible PIC Concentrators (FPCs) and PICs installed in the router or switch chassis, including the hardware version level and serial number.

In the EX Series switch command output, FPC refers to the following:

- On EX2200 switches, EX3200 switches, EX4200 standalone switches, and EX4500 switches—Refers to the switch; FPC *number* is always 0.
- On EX4200 switches in a Virtual Chassis configuration—Refers to the member of a Virtual Chassis; FPC *number* equals the member ID, from 0 through 9.
- On EX8208 and EX8216 switches—Refers to a line card; FPC *number* equals the slot number for the line card.

On QFX3500, QFX5100, and OCX Series standalone switches, both the FPC and FPC *number* are always **0**.

On T4000 Type 5 FPCs, there are no **top temperature sensor** or **bottom temperature sensor** parameters. Instead, **fan intake temperature sensor** and **fan exhaust temperature sensors** parameters are displayed.

Starting from Junos OS Release 11.4, the output of the **show chassis hardware models** operational mode command displays the enhanced midplanes FRU model numbers (CHAS-BP3-MX240-S, CHAS-BP3-MX480-S or CHAS-BP3-MX960-S) based on the router. Prior to release 11.4, the FRU model numbers are left blank when the router has enhanced midplanes. Note that the enhanced midplanes are introduced through the Junos OS Release 13.3, but can be supported on all Junos OS releases.

Starting with Junos OS Release 14.1, the output of the **show chassis hardware detail | extensive | clei-models | models** operational mode command displays the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-P1A) and other components in a PTX5000 Packet Transport Router.

Options

none—Display information about hardware. For a TX Matrix router, display information about the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display information about the TX Matrix Plus router and its attached routers.

clei-models—(Optional) Display Common Language Equipment Identifier (CLEI) barcode and model number for orderable field-replaceable units (FRUs).

detail—(Optional) Include RAM and disk information in output.

extensive—(Optional) Display ID EEPROM information.

all-members—(MX Series routers only) (Optional) Display hardware-specific information for all the members of the Virtual Chassis configuration.

interconnect-device ***name***—(QFabric systems only) (Optional) Display hardware-specific information for the Interconnect device.

lcc ***number***—(TX Matrix routers and TX Matrix Plus router only) (Optional) On a TX Matrix router, display hardware information for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display hardware information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display hardware-specific information for the local Virtual Chassis members.

member ***member-id***—(MX Series routers and EX Series switches) (Optional) Display hardware-specific information for the specified member of the Virtual Chassis configuration. Replace *member-id* variable with a value 0 or 1.

models—(Optional) Display model numbers and part numbers for orderable FRUs and, for components that use ID EEPROM format v2, the CLEI code.

node-device ***name***—(QFabric systems only) (Optional) Display hardware-specific information for the Node device.

scc—(TX Matrix router only) (Optional) Display hardware information for the TX Matrix router (switch-card chassis).

sfc ***number***—(TX Matrix Plus router only) (Optional) Display hardware information for the TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with **0**.

Additional Information The **show chassis hardware detail** command now displays DIMM information for the following Routing Engines:

Table 89: Routing Engines Displaying DIMM Information

Routing Engines	Routers
RE-S-1800x2 and RE-S-1800x4	MX240, MX480, and MX960 routers
RE-A-1800x2	M120 and M320 routers

In Junos OS Release 11.4 and later, the output for the **show chassis hardware models** operational mode command for MX Series routers display the enhanced midplanes FRU model numbers—CHAS-BP3-MX240-S, CHAS-BP3-MX480-S, or CHAS-BP3-MX960-S—based on the router. In releases before Junos OS Release 11.4, the FRU model numbers are left blank when the router has enhanced midplanes. Note that the enhanced midplanes are introduced through Junos OS Release 13.3, but can be supported on all Junos OS releases.

Required Privilege Level view

Related Documentation

- show chassis power on page 1464

List of Sample Output

show chassis hardware (EX8216 Switch) on page 1262
show chassis hardware clei-models (EX8216 Switch) on page 1263
show chassis hardware clei-models (T1600 Router) on page 1264
show chassis hardware detail (EX4200 Switch) on page 1265
show chassis hardware (EX4300 Switch) on page 1265
show chassis hardware models (EX4500 Switch) on page 1265
show chassis hardware detail (EX9200 Switch) on page 1265
show chassis hardware (J6350 Router) on page 1266

show chassis hardware models (TX Matrix Plus Router) on page 1398
show chassis hardware (TX Matrix Plus router with 3D SIBs) on page 1401
show chassis hardware clei-models (TX Matrix Plus router with 3D SIBs) on page 1404
show chassis hardware detail (TX Matrix Plus router with 3D SIBs) on page 1408
show chassis hardware lcc (TX Matrix Plus router with 3D SIBs) on page 1411
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show chassis hardware extensive (MX Routers with Media Services Blade [MSB]) on page 1424
show chassis hardware (QFX3500 Switch running Enhanced Layer 2 Software) on page 1426
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Output Fields Table 90 on page 1260 lists the output fields for the **show chassis hardware** command. Output fields are listed in the approximate order in which they appear.

Table 90: show chassis hardware Output Fields

Field Name	Field Description	Level of Output
Item	Chassis component: • (EX Series switches)—Information about the chassis, Routing Engine (SRE and Routing Engine modules in EX8200 switches), power supplies, fan trays, and LCD panel. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs). Information about the backplane, midplane, and SIBs (SF modules) is displayed for EX8200 switches. See *EX Series Switches Hardware and CLI Terminology Mapping*. • (MX Series routers and EX Series switches)—Information about the backplane, Routing Engine, Power Entry Modules (PEMs), and fan trays. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs), Modular Port Concentrators (MPCs) and associated Modular Interface Cards (MICs), or Dense Port Concentrators (DPCs). MX80 routers have a single Routing Engine and a built-in Packet Forwarding Engine that attaches directly to MICs. The Packet Forwarding Engine has two “pseudo” FPCs (FPC 0 and FPC1). MX80 routers also have a Forwarding Engine Board (FEB). MX104 routers have a built-in Packet forwarding Engine and a Forwarding Engine Board (FEB). The Packet Forwarding Engine of the MX104 router has three “pseudo” FPCs (FPC0, FPC1, and FPC2). • (M Series routers, except for the M320 router)—Information about the backplane; power supplies; fan trays; Routing Engine; maxicab (the connection between the Routing Engine and the backplane, for the M40 router only); SCB, SSB, SFM, or FEB; MCS and PCG (for the M160 router only); each FPC and PIC; and each fan, blower, and impeller. • (M120, M320, and T Series routers)—Information about the backplane, power supplies, fan trays, midplane, FPM (craft interface), CIP, PEM, SCG, CB, FPC, PIC, SFP, SPMB, and SIB. • (QFX Series)—Information about the chassis, Pseudo CB, Routing Engine, power supplies, fan trays, Interconnect devices, and Node devices. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs). • (PTX Series)—Information about the chassis, midplane, craft interface (FPM), power distribution units (PDUs) and Power Supply Modules (PSMs), Centralized Clock Generators (CCGs), Routing Engines, Control Boards (CBs) and Switch Processor Mezzanine Boards (SPMBs), Flexible PIC Concentrators (FPCs), PICs, Switch Interface Boards (SIBs), and fan trays (vertical and horizontal). • (MX2010 and MX2020 routers)—Information about the chassis, midplane, craft interface (FPM), power midplane (PMP), Power Supply Modules (PSMs), Power Distribution Modules (PDMs), Routing Engines, Control Boards (CBs) and Switch Processor Mezzanine Boards (SPMBs), Switch Fabric Boards (SFBs), Flexible PIC Concentrators (FPCs), PICs, adapter cards (ADCs) and fan trays.	All levels
Version	Revision level of the chassis component.	All levels
Part number	Part number of the chassis component.	All levels
Serial number	Serial number of the chassis component. The serial number of the backplane is also the serial number of the router chassis. Use this serial number when you need to contact Juniper Networks Customer Support about the router or switch chassis.	All levels

Table 90: show chassis hardware Output Fields *(continued)*

Field Name	Field Description	Level of Output
Assb ID or **Assembly ID**	(**extensive** keyword only) Identification number that describes the FRU hardware.	**extensive**
Assembly Version	(**extensive** keyword only) Version number of the FRU hardware.	**extensive**
Assembly Flags	(**extensive** keyword only) Flags.	**extensive**
FRU model number	(**clei-models**, **extensive**, and **models** keyword only) Model number of the FRU hardware component.	none specified
CLEI code	(**clei-models** and **extensive** keyword only) Common Language Equipment Identifier code. This value is displayed only for hardware components that use ID EEPROM format v2. This value is not displayed for components that use ID EEPROM format v1.	none specified
EEPROM Version	ID EEPROM version used by the hardware component: **0x00** (version 0), **0x01** (version 1), or **0x02** (version 2).	**extensive**
Description	Brief description of the hardware item: • Type of power supply. • Type of PIC. If the PIC type is not supported on the current software release, the output states **Hardware Not Supported**. • Type of FPC: **FPC Type 1**, **FPC Type 2**, **FPC Type 3**, **FPC Type 4** , or **FPC TypeOC192**. On EX Series switches, a brief description of the FPC. On the J Series routers, the FPC type corresponds to the Physical Interface Module (PIM). The following list shows the PIM abbreviation in the output and the corresponding PIM name. • **2x FE**—Either two built-in Fast Ethernet interfaces (fixed PIM) or dual-port Fast Ethernet PIM • **4x FE**—4-port Fast Ethernet ePIM • **1x GE Copper**—Copper Gigabit Ethernet ePIM (one 10-Mbps, 100-Mbps, or 1000-Mbps port) • **1x GE SFP**—SFP Gigabit Ethernet ePIM (one fiber port) • **4x GE Base PIC**—Four built-in Gigabit Ethernet ports on a J4350 or J6350 chassis (fixed PIM) • **2x Serial**—Dual-port serial PIM • **2x T1**—Dual-port T1 PIM • **2x E1**—Dual-port E1 PIM • **2x CT1E1**—Dual-port channelized T1/E1 PIM • **1x T3**—T3 PIM (one port) • **1x E3**—E3 PIM (one port) • **4x BRI S/T**—4-port ISDN BRI S/T PIM • **4x BRI U**—4-port ISDN BRI U PIM • **1x ADSL Annex A**—ADSL 2/2+ Annex A PIM (one port, for POTS) • **1x ADSL Annex B**—ADSL 2/2+ Annex B PIM (one port, for ISDN)	All levels

Table 90: show chassis hardware Output Fields *(continued)*

Field Name	Field Description	Level of Output
	- **2x SHDSL (ATM)**—G SHDSL PIM (2-port two-wire module or 1-port four-wire module) - **1x TGM550**—TGM550 Telephony Gateway Module (Avaya VoIP gateway module with one console port, two analog **LINE** ports, and two analog **TRUNK** ports) - **1x DS1 TIM510**—TIM510 E1/T1 Telephony Interface Module (Avaya VoIP media module with one E1 or T1 trunk termination port and ISDN PRI backup) - **4x FXS, 4xFXO, TIM514**—TIM514 Analog Telephony Interface Module (Avaya VoIP media module with four analog **LINE** ports and four analog **TRUNK** ports) - **4x BRI TIM521**—TIM521 BRI Telephony Interface Module (Avaya VoIP media module with four ISDN BRI ports) - **Crypto Accelerator Module**—For enhanced performance of cryptographic algorithms used in IP Security (IPsec) services • **MPC M 16x 10GE**—16-port 10-Gigabit Module Port Concentrator that supports SFP+ optical transceivers. (Not on EX Series switches.) • For hosts, the Routing Engine type. • For small form-factor pluggable transceiver (SFP) modules, the type of fiber: **LX**, **SX**, **LH**, or **T**. • LCD description for EX Series switches (except EX2200 switches). • **MPC2**—1-port MPC2 that supports two separate slots for MICs. • **MPC3E**—1-port MPC3E that supports two separate slots for MICs (MIC-3D-1X100GE-CFP and MIC-3D-20GE-SFP) on MX960, MX480, and MX240 routers. The MPC3E maps one MIC to one PIC (1 MIC, 1 PIC), which differs from the mapping of legacy MPCs. • 100GBASE-LR4, pluggable CFP optics • Supports the Enhanced MX Switch Control Board with fabric redundancy and existing SCBs without fabric redundancy. • Interoperates with existing MX Series line cards, including Flexible Port Concentrators (FPC), Dense Port Concentrators (DPCs), and Modular Port Concentrators (MPCs). • **MPC4E**—Fixed configuration MPC4E that is available in two flavors: MPC4E-3D-32XGE-SFPP and MPC4E-3D-2CGE-8XGE on MX2020, MX960, MX480, and MX240 routers. • LCD description for MX Series routers	

Sample Output

show chassis hardware (EX8216 Switch)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis          REV 06                CY0109220035      EX8216
Midplane         REV 06   710-016845   BA0909120112      EX8216-MP
CB 0             REV 22   710-020771   AX0109197723      EX8216-RE320
CB 1             REV 22   710-020771   AX0109197726      EX8216-RE320
  Routing Engine 1        BUILTIN      BUILTIN           RE-EX8216
FPC 3            REV 19   710-020683   BC0109083125      EX8200-48F
```



```
  CPU            REV 13   710-020598   BF0109144549     EX8200-CPU
FPC 4            REV 17   710-020683   BC0108500127     EX8200-48F
  CPU            REV 10   710-020598   BF0108460510     EX8200-CPU
  PIC 0                   BUILTIN      BUILTIN          48x 100 Base-QFX/1000
Base-X
    Xcvr 1       REV 01   740-011613   PE70V89          SFP-SX
    Xcvr 11      REV 01   740-011613   PE70YCE          SFP-SX
    Xcvr 12      REV 01   740-011613   PE70VSH          SFP-SX
    Xcvr 13      REV 01   740-011613   E08C02063        SFP-SX
    Xcvr 14      REV 01   740-011613   PE70VKU          SFP-SX
    Xcvr 15      REV 01   740-011613   E08E03372        SFP-SX
    Xcvr 21      REV 01   740-011613   PE70VAD          SFP-SX
    Xcvr 22      REV 01   740-011613   E08E01228        SFP-SX
    Xcvr 23      REV 01   740-011613   PE70VSL          SFP-SX
    Xcvr 24      REV 01   740-011613   E08E03409        SFP-SX
    Xcvr 25      REV 01   740-011613   PE70VL4          SFP-SX
    Xcvr 26      REV 01   740-011613   PDQ4L2Z          SFP-SX
    Xcvr 27      REV 01   740-011613   PE70WFK          SFP-SX
    Xcvr 28      REV 01   740-011782   PBD2B5U          SFP-SX
    Xcvr 29      REV 01   740-011613   PE70UQX          SFP-SX
    Xcvr 30      REV 01   740-011613   PE70VL5          SFP-SX
    Xcvr 31      REV 01   740-011613   PE70V0F          SFP-SX
    Xcvr 32      REV 01   740-011613   E08C02052        SFP-SX
    Xcvr 33      REV 01   740-011613   E08C02197        SFP-SX
    Xcvr 34      REV 01   740-011613   PE70V0L          SFP-SX
    Xcvr 35      REV 01   740-011613   E08E03390        SFP-SX
    Xcvr 36      REV 01   740-011613   PDQ4VL9          SFP-SX
    Xcvr 37      REV 01   740-011613   E08E03370        SFP-SX
    Xcvr 38      REV 01   740-011613   E08E03362        SFP-SX
    Xcvr 39      REV 01   740-011613   E08C02065        SFP-SX
    Xcvr 40      REV 01   740-011613   E08E03405        SFP-SX
    Xcvr 41      REV 01   740-011613   E08E03411        SFP-SX
    Xcvr 43      REV 01   740-011613   E08C02171        SFP-SX
    Xcvr 45      REV 01   740-011613   E08E03410        SFP-SX
FPC 13           REV 16   710-016837   BB0109051344     EX8200-8XS
  CPU
SIB 0            REV 10   710-021613   AY0109166244     EX8216-SF320
SIB 1            REV 10   710-021613   AY0109166357     EX8216-SF320
SIB 2            REV 10   710-021613   AY0109166362     EX8216-SF320
SIB 3            REV 10   710-021613   AY0109166338     EX8216-SF320
SIB 4            REV 10   710-021613   AY0109166350     EX8216-SF320
SIB 5            REV 10   710-021613   AY0109166365     EX8216-SF320
SIB 6            REV 10   710-021613   AY0109166361     EX8216-SF320
SIB 7            REV 10   710-021613   AY0109166399     EX8216-SF320
PSU 0            REV 17   740-021466   BG0709170003     EX8200-AC2K
PSU 1            REV 17   740-021466   BG0709170004     EX8200-AC2K
PSU 2            REV 17   740-021466   BG0709170020     EX8200-AC2K
PSU 3            REV 17   740-021466   BG0709170017     EX8200-AC2K
PSU 4            REV 17   740-021466   BG0709170008     EX8200-AC2K
PSU 5            REV 17   740-021466   BG0709170018     EX8200-AC2K
Top Fan Tray
  FTC 0          REV 4    760-022620   CX1209140212     EX8216-FT
  FTC 1          REV 4    760-022620   CX1209140212     EX8216-FT
Bottom Fan Tray
  FTC 0          REV 4    760-022620   CX1209140211     EX8216-FT
  FTC 1          REV 4    760-022620   CX1209140211     EX8216-FT
LCD 0            REV 04   710-025742   CE0109186919     EX8200 LCD
```

show chassis hardware clei-models (EX8216 Switch)

`user@host>` **show chassis hardware clei-models**

```
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 08   710-016845
PSU 0            REV 05   740-023002   COUPAEAEAA        EX8200-PWR-AC3KR
PSU 1            REV 05   740-023002   COUPAEAEAA        EX8200-PWR-AC3KR
PSU 2            REV 05   740-023002   COUPAEAEAA        EX8200-PWR-AC3KR
PSU 3            REV 05   740-023002   COUPAEAEAA        EX8200-PWR-AC3KR
PSU 4            REV 05   740-023002   COUPAEAEAA        EX8200-PWR-AC3KR
PSU 5            REV 05   740-023002   COUPAEAEAA        EX8200-PWR-AC3KR
Top Fan Tray
Bottom Fan Tray
```

show chassis hardware clei-models (T1600 Router)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 03   710-005608                     CHAS-BP-T640-S
FPM Display      REV 05   710-002897                     CRAFT-T640-S
CIP              REV 06   710-002895                     CIP-L-T640-S
PEM 0            Rev 07   740-017906   IPUPAC7KTA        PWR-T1600-3-80-DC-S
PEM 1            Rev 18   740-002595                     PWR-T-DC-S
SCG 0            REV 15   710-003423                     SCG-T-S
Routing Engine 0 REV 08   740-014082                     RE-A-2000-4096-S
Routing Engine 1 REV 07   740-014082                     RE-A-2000-4096-S
CB 0             REV 05   710-007655                     CB-T-S
CB 1             REV 03   710-017707                     CB-T-S
FPC 0            REV 07   710-013558                     T640-FPC2-E2
  PIC 0          REV 01   750-010618                     PB-4GE-SFP
  PIC 1          REV 06   750-001900                     PB-1OC48-SON-SMSR
  PIC 2          REV 14   750-001901                     PB-4OC12-SON-SMIR
  PIC 3          REV 07   750-001900                     PB-1OC48-SON-SMSR
FPC 1            REV 06   710-013553                     T640-FPC1-E2
  PIC 0          REV 08   750-001072                     P-1GE-SX
  PIC 1          REV 10   750-012266                     PB-4GE-TYPE1-SFP-IQ2
  PIC 2          REV 22   750-005634                     PB-1CHOC12SMIR-QPP
FPC 2
  PIC 0          REV 16   750-007141                     PC-10GE-SFP
  PIC 1          REV 06   750-015217                     PC-8GE-TYPE3-SFP-IQ2
  PIC 2          REV 05   750-004695                     PC-TUNNEL
  PIC 3          REV 17   750-009553                     PC-4OC48-SON-SFP
FPC 3            REV 01   710-010154                     T640-FPC3-E
  PIC 0          REV 07   750-012793                     PC-1XGE-TYPE3-XFP-IQ2
  PIC 1          REV 25   750-007141                     PC-10GE-SFP
  PIC 2          REV 17   750-009553                     PC-4OC48-SON-SFP
  PIC 3          REV 32   750-003700                     PC-1OC192-SON-VSR
FPC 4            REV 16   710-013037                     T1600-FPC4-ES
 PIC 1           REV 06   750-034781                     PD-1CE-CFP
FPC 5            REV 02   710-013037                     T1600-FPC4-ES
  PIC 0          REV 16   750-012518                     PD-4OC192-SON-XFP
  PIC 1          REV 01   750-010850                     PD-1OC768-SON-SR
FPC 6            REV 14   710-013037                     T1600-FPC4-ES
  PIC 0          REV 11   750-017405                     PD-4XGE-XFP
  PIC 1          REV 13   750-017405                     PD-4XGE-XFP
FPC 7            REV 09   710-007529                     T640-FPC3
  PIC 0          REV 10   750-012793                     PC-1XGE-TYPE3-XFP-IQ2
  PIC 1          REV 01   750-015217                     PC-8GE-TYPE3-SFP-IQ2
  PIC 2          REV 01   750-015217                     PC-8GE-TYPE3-SFP-IQ2
  PIC 3          REV 15   750-009450                     PC-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 (EX4300 Switch)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                PD3713160055      EX4300-48P
Routing Engine 0 REV 04   650-044930   PD3713160055      EX4300-48P
FPC 0            REV 04   650-044930   PD3713160055      EX4300-48P
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0          REV 04   BUILTIN      BUILTIN           48x 10/100/1000 Base-T
  PIC 1          REV 04   BUILTIN      BUILTIN           4x 40GE
Power Supply 0   REV 01   740-046871   1EDA3090026       JPSU-1100-AC-AFO-A
Fan Tray 0                                              Fan Module, Airflow Out
 (AFO)
Fan Tray 1                                              Fan Module, Airflow Out
 (AFO)
```

show chassis hardware models (EX4500 Switch)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Routing Engine 0 REV 01   750-035700   GG0210271867      EX4500-40F-FB-C
FPC 0            REV 01   750-035700   GG0210271867      EX4500-40F-FB-C
  PIC 0                   BUILTIN      BUILTIN           EX4500-40F-FB-C
Power Supply 1   REV 01   740-029654   H884FS00JC09      EX4500-PWR1-AC-FB
```

show chassis hardware detail (EX9200 Switch)

```
user@switch> show chassis hardware

Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN111DA44RFB      EX9208
Midplane         REV 05   710-017414   TS2912            EX9208-BP
FPM Board        REV 02   710-017254   XN1804            Front Panel Display
PEM 0            Rev 01   740-022697   QCS0906C033       PS 1.2-1.7kW; 100-240V
AC in
PEM 1            Rev 01   740-022697   QCS0906C095       PS 1.2-1.7kW; 100-240V
```

```
AC in
Routing Engine 0 REV 08   740-031116   9009122883        RE-S-EX9200-1800X4
CB 0             REV 16   750-031391   CAAW4391          EX9200-SCBEF
PC 0             REV 07   750-049612   CABJ9312          EX9200 40x1G Copper
  CPU          REV 04   711-038484   CABH8268          MPCE PMB 2G
  MIC 0          REV 02   750-049607   CABT9623          40x 1GE RJ45
    PIC 0                 BUILTIN      BUILTIN           10x 1GE RJ45
    PIC 1                 BUILTIN      BUILTIN           10x 1GE RJ45
    PIC 2                 BUILTIN      BUILTIN           10x 1GE RJ45
    PIC 3                 BUILTIN      BUILTIN           10x 1GE RJ45
FPC 1            REV 10   710-013699   CAAN3529          EX9200-40x1G-SFP
  CPU            REV 04   711-038484   CAAL7608          MPCE PMB 2G
   MIC 0          REV 26   750-028392   CAAS5151          20x 1GE SFP
    PIC 0                 BUILTIN      BUILTIN           10x 1GE SFP
    PIC 1                 BUILTIN      BUILTIN           10x 1GE SFP
  MIC 1          REV 26   750-028392   CAAC8006          20x 1GE SFP
    PIC 2                 BUILTIN      BUILTIN           10x 1GE SFP
      Xcvr 8     REV 01   740-011613   E08L03674         SFP-SX
      Xcvr 9     REV 01   740-011613   E08M00243         SFP-SX
    PIC 3                 BUILTIN      BUILTIN           10x 1GE SFP
    FPC 3        REV 10   710-013699   CAAR5261          EX9200-40x1G-SFP
  CPU            REV 04   711-038484   CAAS2118          MPCE PMB 2G
   MIC 0          REV 26   750-028392   CAAS5067          20x 1GE SFP
    PIC 0                 BUILTIN      BUILTIN           10x 1GE SFP
      Xcvr 2     REV 01   740-031851   PNA7L8U           SFP-SX
      Xcvr 3     REV 02   740-011613   AM0943SEKGZ       SFP-SX
      Xcvr 4     REV 02   740-011613   AM0943SEJZ9       SFP-SX
    PIC 1                 BUILTIN      BUILTIN           10x 1GE SFP
  MIC 1          REV 26   750-028392   CAAS5132          20x 1GE SFP
    PIC 2                 BUILTIN      BUILTIN           10x 1GE SFP
      Xcvr 4     REV 01   740-011613   E08D02625         SFP-SX
      Xcvr 9     REV 02   740-011613   PJH4RD9           SFP-SX
    PIC 3                 BUILTIN      BUILTIN           10x 1GE SFP
      Xcvr 0     REV 01   740-011613   AM0813S8YME       SFP-SX
      Fan Tray                                           Left Fan Tray
```

show chassis hardware (J6350 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1090E07ADB      JSR6350
Midplane         REV 03   710-014593   NP1265
System IO        REV 01   710-016210   NN9950            JX350 System IO
Crypto Module                                            Crypto Acceleration
Routing Engine   REV 08   710-015273   NM6509            RE-J6350-3400
   ad0      248 MB   256MB CKS           00102006C24A00000039 Compact
Flash
FPC 0                                                    FPC
   PIC 0                                                  4x GE Base PIC
FPC 1            REV 06   750-010355   AI07030023        FPC
   PIC 0                                                  2x T1
FPC 3            REV 06   750-011148   AJ06520151        FPC
   PIC 0                                                  2x E1
FPC 6            REV 06   750-013492   NC4170            FPC
   PIC 0                                                  4x FE
Power Supply 0
```

show chassis hardware (J6300 Router)

```
user@host> show chassis hardware
```



```
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN000164AB        J6300
Midplane         REV 02.04 710-010001  CORE99570
System IO        REV 02.00 710-010003  CORE100848        System IO board
Routing Engine   RevX2.6  750-010006   IWGS40735390      RE-J.3
FPC 0                                                    FPC
  PIC 0                                                  2x FE
FPC 1            RevX2.0  750-011380   N3960005          FPC
  PIC 0                                                  1xADSL pic Annex A
FPC 2            RevX2.0  750-011380   N3960002          FPC
  PIC 0                                                  1xADSL pic Annex B
FPC 3            REV 03   750-010354   N0780028          FPC
  PIC 0                                                  1x T3
```

show chassis hardware (M7i Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                31959             M7i
Midplane         REV 02   710-008761   CA0209            M7i Midplane
Power Supply 0   Rev 04   740-008537   PD10272           AC Power Supply
Routing Engine   REV 01   740-008846   1000396803        RE-5.0
CFEB             REV 02   750-009492   CA0166           Internet Processor IIv1
FPC 0                                                    E-FPC
  PIC 0          REV 04   750-003163   HJ6416            1x G/E, 1000 BASE-SX
  PIC 1          REV 04   750-003163   HJ6423            1x G/E, 1000 BASE-SX
  PIC 2          REV 04   750-003163   HJ6421            1x G/E, 1000 BASE-SX
  PIC 3          REV 02   750-003163   HJ0425            1x G/E, 1000 BASE-SX
FPC 1                                                    E-FPC
  PIC 2          REV 01   750-009487   HM2275            ASP - Integrated
  PIC 3          REV 01   750-009098   CA0142            2x F/E, 100 BASE-TX

Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                B1157             M7i
Midplane         REV 05   710-008761   DM0840            M7i Midplane
Power Supply 0   Rev 08   740-008537   TE53755           AC Power Supply
Routing Engine   REV 07   740-011202   1000736567        RE-850
CFEB             REV 09   750-010463   DK6952            Internet Processor II
FPC 0                                                    E-FPC
  PIC 0          REV 12   750-012838   DL7993            4x 1GE(LAN), IQ2
    Xcvr 0       REV 01   740-011614   PD94TDJ           SFP-LX10
    Xcvr 1       REV 01   740-011615   PAD5EER           UNSUPPORTED
    Xcvr 2       REV 01   740-011614   PD94THU           SFP-LX10
    Xcvr 3                NON-JNPR     PDC2E7A           SFP-LX10
  PIC 1          REV 03   750-023116   JT0203            4x CHSTM1 SDH CE SFP
    Xcvr 0       REV 01   740-012434   AGT063832PS       SFP-SR
    Xcvr 1       REV 01   740-012434   AGT063832LY       SFP-SR
    Xcvr 3       REV 01   740-016064   C06J19018         SFP-LR
  PIC 2          REV 15   750-014895   DM5757            MultiServices 100
  PIC 3          REV 01   750-025390   JW9448            12x T1/E1 CE
FPC 1                                                    E-FPC
  PIC 2                   BUILTIN      BUILTIN           1x Tunnel
  PIC 3          REV 09   750-009099   DM0899            1x G/E, 1000 BASE
    Xcvr 0       REV 01   740-012434   AGT07150HGJ       UNSUPPORTED
Fan Tray                                                 Rear Fan Tray
```

show chassis hardware (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 MB
  SSRAM bank 1   REV 01   710-001385   S00490            2 MB
  SSRAM bank 2   REV 01   710-001385   S001:?            2 MB
  SSRAM bank 3   REV 01   710-001385   S00483            2 MB
SSB slot 1       N/A      N/A          N/A               Backup
FPC 1            REV 01   710-001292   S/N AB7528
  SSRAM          REV 01   710-000077   S/N 304209        1 MB
  SDRAM bank 0   REV 01   710-000099   S/N 000603        64 MB
  SDRAM bank 1   REV 01   710-000099   S/N 000414        64 MB
  PIC 0          REV 03   750-000612   S/N AB8433        2x OC-3 ATM, MM
  PIC 1          REV 01   750-000616   S/N AA1168        1x OC-12 ATM, MM
```



```
  PIC 2          REV 01   750-000613   S/N AA1008         1x OC-12 SONET, SMIR
  PIC 3          REV 01   750-002501   S/N AD5810         4x E3
FPC 2            REV 01   710-001292   S/N AC0119
  SSRAM          REV 01   710-000077   S/N 503241         1 MB
  SDRAM bank 0   REV 01   710-000099   S/N 306835         64 MB
  SDRAM bank 1   REV 01   710-000099   S/N 306832         64 MB
Fan Tray 0                                                Front Upper Fan Tray
Fan Tray 1                                                Front Middle Fan Tray
Fan Tray 2                                                Front Bottom Fan Tray
Fan Tray 3                                                Rear Fan Tray
```

show chassis hardware models (M20 Router)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  CLEI code          FRU model number
Backplane        REV 03   710-002334                      CHAS-MP-M20-S
Power Supply A   REV 06   740-001465                      PWR-M20-AC-S
Display          REV 04   710-001519                      CRAFT-M20-S
Routing Engine 0 REV 06   740-003239                      RE-333-768-S
Routing Engine 1 REV 06   740-003239                      RE-333-768-S
SSB 0            REV 02   710-001951                      SSB-E-M20
SSB 1            N/A      N/A
FPC 0            REV 03   710-003308                      FPC-E
  PIC 0          REV 08   750-002303                      P-4FE-TX
  PIC 1          REV 07   750-004745                      P-2MCDS3
  PIC 2          REV 03   750-002965                      PE-4CHDS3
FPC 1            REV 03   710-003308                      FPC-E
  PIC 0          REV 03   750-002914                      P-2OC3-ATM-MM
Fan Tray 0                                                FANTRAY-F-M20-S
Fan Tray 1                                                FANTRAY-F-M20-S
Fan Tray 2                                                FANTRAY-F-M20-S
Fan Tray 3                                                FANTRAY-R-M20-S
```

show chassis hardware (M40 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number      Description
Backplane        REV 02   710-000073   S/N AA0053
Power supply A   Rev 2    740-000235   S/N 000042         DC
Maxicab          REV X1   710-000229   S/N AA0139
Minicab          REV X1   710-000482   S/N AA0201
Display          REV 06   710-000150   S/N AA0905
Host                                                      cpv5000
SCB              REV X1   710-000075   S/N AA0158         Internet Processor I
  SSRAM bank 0   REV 02   710-000077   S/N AA2267         1 MB
  SSRAM bank 1   REV 02   710-000077   S/N AA2270         1 MB
  SSRAM bank 2   REV 02   710-000077   S/N AA2269         1 MB
  SSRAM bank 3   REV 02   710-000077   S/N AA2268         1 MB
FPC 0            REV 01   710-000175   S/N AA0048
  SSRAM          REV 01   710-000077   S/N AA2333         1 MB
  SDRAM bank 0   REV 01   710-000099   S/N AA2332         64 MB
  SDRAM bank 1   REV X1   710-000099   S/N AA2337         64 MB
  PIC 0          REV 04   750-000613   S/N aa0343         1x OC-12 SONET, SMIR
  PIC 1          REV 04   750-000613   S/N AA0379         1x OC-12 SONET, SMIR
  PIC 2          REV 04   750-000613   S/N AA0377         1x OC-12 SONET, SMIR
  PIC 3          REV 04   750-000613   S/N AA0378         1x Tunnel
FPC 2            REV 01   710-000175   S/N AA0042
  SSRAM          REV 02   710-000077   S/N AA2288         1 MB
  SDRAM bank 0   REV 01   710-000099   S/N AA2331         64 MB
```

```
  SDRAM bank 1   REV 01   710-000099   S/N AA2330       64 MB
  PIC 0          REV X1   750-000603   S/N AA0143       4x OC-3 SONET, SMIR
  PIC 1          REV X1   750-000615   S/N AA0149       4x OC-3 SONET, MM
  PIC 2          REV X1   750-000611   S/N AA0148       4x OC-3 SONET, MM
  PIC 3          REV 04   750-000613   S/N AA0330       1x OC-12 SONET, SMIR
FPC 4            REV 01   710-000175   S/N AA0050
  SSRAM          REV 01   710-000077   S/N AA2327       1 MB
  SDRAM bank 0   REV 01   710-000099   S/N AA2329       64 MB
  SDRAM bank 1   REV 01   710-000099   S/N AA2328       64 MB
  PIC 0          REV 04   750-000613   S/N AA0320       1x OC-12 SONET, SMIR
  PIC 2          REV 05   750-000616   S/N AA1341       1x OC-12 ATM, MM
  PIC 3          REV 08   750-001072   S/N AB2462       1x G/E, 1000 BASE-SX
FPC 5            REV 10   710-000175   S/N AA7663
  SSRAM          REV 01   710-000077   S/N 501590       1 MB
  SDRAM bank 0   REV 01   710-000099   S/N 300949       64 MB
  SDRAM bank 1   REV 01   710-000099   S/N 300868       64 MB
  PIC 1          REV 01   750-001323   S/N AB1670       1x Tunnel
```

show chassis hardware (M40e Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                  m40e
Midplane         REV 01   710-005071   AX3671
FPM CMB          REV 03   710-001642   AR9074
FPM Display      REV 03   710-001647   AR7331
CIP              REV 04   710-002649   BB4449
PEM 0            Rev 01   740-003787   MC12364           Power Entry Module
PEM 1            Rev 01   740-003787   MC12383           Power Entry Module
PCG 0            REV 07   710-001568   AG1332
PCG 1            REV 07   710-001568   AR3789
Host 0                                 3e000007c8176601  Present
MCS 0            REV 11   710-001226   AN5813
SFM 0 SPP        REV 07   710-001228   AG4676
SFM 0 SPR        REV 05   710-002189   AE4735            Internet Processor II
SFM 1 SPP        REV 07   710-001228   AP1347
SFM 1 SPR        REV 05   710-002189   BE0063            Internet Processor II
FPC 0            REV 01   710-011725   BE0669            M40e-EP-FPC Type 1
  CPU            REV 01   710-004600   BD9504
  PIC 0          REV 03   750-003737   AY3991            4x G/E, 1000 BASE-SX
FPC 1            REV 01   710-005197   BD9842            M40e-FPC Type 2
  CPU            REV 01   710-004600   BB4869
  PIC 0          REV 07   750-001900   AR8278            1x OC-48 SONET, SMSR
FPC 2            REV 02   710-005197   BD9824            M40e-FPC Type 2
  CPU            REV 01   710-004600   BD9531
  PIC 0          REV 03   750-003737   AY3986            4x G/E, 1000 BASE-SX
FPC 4            REV 02   710-005078   BE0664            M40e-FPC Type 1
  CPU            REV 01   710-004600   BD9559
  PIC 0          REV 03   750-001894   AG7963            1x G/E, 1000 BASE-SX
  PIC 2          REV 01   750-002575   AF2472            4x OC-3 SONET, SMIR
FPC 6            REV 02   710-005078   BE0652            M40e-FPC Type 1
  CPU            REV 01   710-004600   BD9607
  PIC 0          REV 02   750-002911   AN2286            4x F/E, 100 BASE-TX
  PIC 2          REV 01   750-002577   AP6345            4x OC-3 SONET, MM
```

show chassis hardware (M120 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
```



```
Chassis                                     JN000054AC        M120
Midplane         REV 01   710-013667   RB4170            M120 Midplane
FPM Board        REV 02   710-011407   CJ9186            M120 FPM Board
FPM Display      REV 02   710-011405   CJ9173            M120 FPM Display
FPM CIP          REV 02   710-011410   CJ9221            M120 FPM CIP
PEM 0            Rev 05   740-011936   RM28320           AC Power Entry Module
PEM 1            Rev 05   740-011936   RM28321           AC Power Entry Module
Routing Engine 0 REV 03   740-014080   1000642883        RE-A-1000
CB 0             REV 03   710-011403   CM8346            M120 Control Board
CB 1             REV 06   710-011403   CP6728            M120 Control Board
FPC 1            REV 02   710-015908   CP6925            M120 CFPC 10GE
  PIC 0                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN) XFP
    Xcvr 0       REV 01   740-014279   62E204N00007      XFP-10G-LR
FPC 3            REV 03   710-011393   CJ9234            M120 FPC Type 2
  PIC 0          REV 16   750-008155   NB5229            2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F15JB           SFP-SX
    Xcvr 1       REV 01   740-007326   P4Q0R9G           SFP-SX
  PIC 1          REV 09   750-007745   CG4360            4x OC-3 SONET, SMIR
  PIC 2          REV 16   750-008155   ND7787            2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F12AS           SFP-SX
    Xcvr 1       REV 01   740-011613   P9F1ALU           SFP-SX
  PIC 3          REV 07   750-011800   JW1284            8x 1GE(LAN), IQ2
    Xcvr 0       REV 01   740-011613   P9F1AM6           SFP-SX
    Xcvr 6       REV 01   740-011613   P9F16NN           SFP-SX
    Xcvr 7       REV 01   740-011782   P8C29Y7           SFP-SX
  Board B        REV 02   710-011395   CN3754            M120 FPC Mezz
FPC 4            REV 02   710-011398   CP6741            M120 FPC Type 3
  PIC 0          REV 16   750-007141   NB2855            10x 1GE(LAN), 1000 BASE

    Xcvr 0       REV 01   740-011782   P922A1F           SFP-SX
    Xcvr 1       REV 01   740-011782   P922A16           SFP-SX
    Xcvr 2       REV 01   740-011782   P922A0U           SFP-SX
    Xcvr 3       REV 01   740-011782   P9229UZ           SFP-SX
    Xcvr 4       REV 01   740-009029   P11JXWP           SFP-LX
    Xcvr 6       REV 01   740-011613   P9F1ALW           SFP-SX
FPC 5            REV 01   710-011388   CJ9088            M120 FPC Type 1
  PIC 0          *** Hardware Not Supported ***
  PIC 1          REV 05   750-012052   NB0410            1x CHOC3 IQ SONET, SMLR

  PIC 2          REV 01   750-013167   CM3824            4x CHDS3 IQ
  PIC 3          REV 01   750-010240   CB5366            1x G/E SFP, 1000 BASE
  Board B        REV 01   710-011390   CJ9103            M120 FPC Mezz Board
FEB 3            REV 04   710-011663   CP6673            M120 FEB
FEB 4            REV 04   710-011663   CJ9368            M120 FEB
FEB 5            REV 04   710-011663   CJ9386            M120 FEB
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
Fan Tray 2                                               Rear Top Fan Tray
Fan Tray 3                                               Rear Bottom Fan Tray
```

show chassis hardware detail (M120 Router)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN000054AC        M120
Midplane         REV 01   710-013667   RB4170            M120 Midplane
FPM Board        REV 02   710-011407   CJ9186            M120 FPM Board
FPM Display      REV 02   710-011405   CJ9173            M120 FPM Display
FPM CIP          REV 02   710-011410   CJ9221            M120 FPM CIP
PEM 0            Rev 05   740-011936   RM28320           AC Power Entry Module
```

```
PEM 1             Rev 05   740-011936   RM28321           AC Power Entry Module
Routing Engine 0 REV 03   740-014080   1000642883        RE-A-1000
  ad0      248 MB  SILICONSYSTEMS INC 256M 126CT505S0763SC00110 Compact Flash
  ad2    38154 MB  HTE541040G9SA00     MPBBT0X2HS2E3M    Hard Disk
CB 0              REV 03   710-011403   CM8346            M120 Control Board
CB 1              REV 06   710-011403   CP6728            M120 Control Board
FPC 1             REV 02   710-015908   CP6925            M120 CFPC 10GE
  PIC 0                    BUILTIN      BUILTIN           1x 10GE(LAN/WAN) XFP
    Xcvr 0        REV 01   740-014279   62E204N00007      XFP-10G-LR
FPC 3             REV 03   710-011393   CJ9234            M120 FPC Type 2
  PIC 0           REV 16   750-008155   NB5229            2x G/E IQ, 1000 BASE
    Xcvr 0        REV 01   740-011613   P9F15JB           SFP-SX
    Xcvr 1        REV 01   740-007326   P4Q0R9G           SFP-SX
  PIC 1           REV 09   750-007745   CG4360            4x OC-3 SONET, SMIR
  PIC 2           REV 16   750-008155   ND7787            2x G/E IQ, 1000 BASE
    Xcvr 0        REV 01   740-011613   P9F12AS           SFP-SX
    Xcvr 1        REV 01   740-011613   P9F1ALU           SFP-SX
  PIC 3           REV 07   750-011800   JW1284            8x 1GE(LAN), IQ2
    Xcvr 0        REV 01   740-011613   P9F1AM6           SFP-SX
    Xcvr 6        REV 01   740-011613   P9F16NN           SFP-SX
    Xcvr 7        REV 01   740-011782   P8C29Y7           SFP-SX
  Board B         REV 02   710-011395   CN3754            M120 FPC Mezz
FPC 4             REV 02   710-011398   CP6741            M120 FPC Type 3
  PIC 0           REV 16   750-007141   NB2855            10x 1GE(LAN), 1000 BASE

    Xcvr 0        REV 01   740-011782   P922A1F           SFP-SX
    Xcvr 1        REV 01   740-011782   P922A16           SFP-SX
    Xcvr 2        REV 01   740-011782   P922A0U           SFP-SX
    Xcvr 3        REV 01   740-011782   P9229UZ           SFP-SX
    Xcvr 4        REV 01   740-009029   P11JXWP           SFP-LX
    Xcvr 6        REV 01   740-011613   P9F1ALW           SFP-SX
FPC 5             REV 01   710-011388   CJ9088            M120 FPC Type 1
  PIC 0           *** Hardware Not Supported ***
  PIC 1           REV 05   750-012052   NB0410            1x CHOC3 IQ SONET, SMLR

  PIC 2           REV 01   750-013167   CM3824            4x CHDS3 IQ
  PIC 3           REV 01   750-010240   CB5366            1x G/E SFP, 1000 BASE
  Board B         REV 01   710-011390   CJ9103            M120 FPC Mezz Board
FEB 3             REV 04   710-011663   CP6673            M120 FEB
FEB 4             REV 04   710-011663   CJ9368            M120 FEB
FEB 5             REV 04   710-011663   CJ9386            M120 FEB
Fan Tray 0                                                Front Top Fan Tray
Fan Tray 1                                                Front Bottom Fan Tray
Fan Tray 2                                                Rear Top Fan Tray
Fan Tray 3                                                Rear Bottom Fan Tray
```

show chassis hardware models (M120 Router)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 01   710-013667
FPM CIP          REV 02   710-011410                     CRAFT-M120-S
PEM 0            Rev 05   740-011936                     PWR-M120-AC-S
PEM 1            Rev 05   740-011936                     PWR-M120-AC-S
Routing Engine 0 REV 03   740-014080                     RE-A-1000-2048-S
CB 0             REV 03   710-011403                     CB-M120-S
CB 1             REV 06   710-011403                     CB-M120-S
FPC 1            REV 02   710-015908                     M120-cFPC-1XGE-XFP
FPC 3
  PIC 0          REV 16   750-008155                     PB-2GE-SFP-QPP
```

```
  PIC 1          REV 09   750-007745                    PC-4OC3-SON-SMIR
  PIC 2          REV 16   750-008155                    PB-2GE-SFP-QPP
  PIC 3          REV 07   750-011800                    PB-8GE-TYPE2-SFP-IQ2
FPC 4
  PIC 0          REV 16   750-007141                    PC-10GE-SFP
FPC 5
  PIC 1          REV 05   750-012052                    PB-1CHOC3-SMIR-QPP
  PIC 2          REV 01   750-013167                    PE-4CHDS3-QPP
  PIC 3          REV 01   750-010240                    PB-1GE-SFP
Fan Tray 0                                              FFANTRAY-M120-S
Fan Tray 1                                              FFANTRAY-M120-S
Fan Tray 2                                              RFANTRAY-M120-S
Fan Tray 3                                              RFANTRAY-M120-S
```

show chassis hardware (M160 Router)

```
user@host> show chassis hardware
Item             Version  Part number  Serial number     Description
Chassis                                101               M160
Midplane         REV 02   710-001245   S/N AB4107
FPM CMB          REV 01   710-001642   S/N AA2911
FPM Display      REV 01   710-001647   S/N AA2999
CIP              REV 02   710-001593   S/N AA9563
PEM 0            Rev 01   740-001243   S/N KJ35769       DC
PEM 1            Rev 01   740-001243   S/N KJ35765       DC
PCG 0            REV 01   710-001568   S/N AA9794
PCG 1            REV 01   710-001568   S/N AA9804
Host 1                                 da000004f8d57001  teknor
MCS 1            REV 03   710-001226   S/N AA9777
SFM 0 SPP        REV 04   710-001228   S/N AA2975
SFM 0 SPR        REV 02   710-001224   S/N AA9838        Internet Processor I
SFM 1 SPP        REV 04   710-001228   S/N AA2860
SFM 1 SPR        REV 01   710-001224   S/N AB0139        Internet Processor I
FPC 0            REV 03   710-001255   S/N AA9806        FPC Type 1
  CPU            REV 02   710-001217   S/N AA9590
  PIC 1          REV 05   750-000616   S/N AA1527        1x OC-12 ATM, MM
  PIC 2          REV 05   750-000616   S/N AA1535        1x OC-12 ATM, MM
  PIC 3          REV 01   750-000616   S/N AA1519        1x OC-12 ATM, MM
FPC 1            REV 02   710-001611   S/N AA9523        FPC Type 2
  CPU            REV 02   710-001217   S/N AA9571
  PIC 0          REV 03   750-001900   S/N AA9626        1x STM-16 SDH, SMIR
  PIC 1          REV 01   710-002381   S/N AD3633        2x G/E, 1000 BASE-SX
FPC 2                                                    FPC Type OC192
  CPU            REV 03   710-001217   S/N AB3329
  PIC 0          REV 01                                  1x OC-192 SM SR-2
Fan Tray 0                                               Rear Bottom Blower
Fan Tray 1                                               Rear Top Blower
Fan Tray 2                                               Front Top Blower
Fan Tray 3                                               Front Fan Tray
```

show chassis hardware models (M160 Router)

```
user@host> show chassis hardware models
 Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 03   710-009120                     CHAS-BP-M320-S
FPM Display      REV 02   710-009351                     CRAFT-M320-S
CIP              REV 03   710-005926                     CIP-M320-S
PEM 2            Rev X4   740-009148                     PWR-M-DC-S
PEM 3            Rev X4   740-009148                     PWR-M-DC-S
Routing Engine 0 REV 02   740-008883                     RE-1600-2048-S
```

```
Routing Engine 1 REV 02    740-008883                            RE-1600-2048-S
FPC 0            REV 02    710-010419                            M320-FPC1
  PIC 0          REV 01    750-001323                            P-TUNNEL
  PIC 1          REV 02    750-002987                            PE-1OC12-SON-SMIR
  PIC 2          REV 04    750-001894                            PB-1GE-SX
  PIC 3          REV 04    750-001896                            PB-1OC12-SON-SMIR
FPC 1            REV 02    710-010419                            M320-FPC1
  PIC 0          REV 04    750-001894                            PB-1GE-SX
  PIC 1          REV 04    750-001894                            PB-1GE-SX
  PIC 3          REV 03    750-001894                            PB-1GE-SX
FPC 2            REV 02    710-010419                            M320-FPC1
  PIC 0          REV 10    750-005634                            PB-1CHOC12SMIR-QPP
  PIC 1          REV 10    750-005634                            PB-1CHOC12SMIR-QPP
  PIC 2          REV 07    750-005634                            PB-1CHOC12SMIR-QPP
  PIC 3          REV 07    750-005634                            PB-1CHOC12SMIR-QPP
  PIC 1          REV 10    750-005634                            PB-1CHOC12SMIR-QPP
  PIC 2          REV 07    750-005634                            PB-1CHOC12SMIR-QPP
  PIC 3          REV 07    750-005634                            PB-1CHOC12SMIR-QPP
FPC 3
  PIC 0          REV 03    750-001895                            PB-1OC12-SON-MM
  PIC 1          REV 04    750-001894                            PB-1GE-SX
  PIC 3          REV 04    750-003141                            PB-1GE-SX-B
FPC 4            REV 02    710-010419                            M320-FPC1
FPC 5            REV 02    710-010419                            M320-FPC1
FPC 6            REV 02    710-010419                            M320-FPC1
FPC 7
  PIC 0          REV 15    750-001901                            PB-4OC12-SON-SMIR
  PIC 1          REV 06    750-001900                            PB-1OC48-SON-SMSR
  PIC 2          REV 07    750-001900                            PB-1OC48-SON-SMSR
  PIC 3          REV 05    750-003737                            PB-4GE-SX
SIB 0            REV 03    710-009184                            SIB-M-S
SIB 1            REV 03    710-009184                            SIB-M-S
SIB 2            REV 03    710-009184                            SIB-M-S
SIB 3            REV 03    710-009184                            SIB-M-S
Fan Tray 0                                                       FFANTRAY-M320-S
Fan Tray 1                                                       FFANTRAY-M320-S
Fan Tray 2                                                       RFANTRAY-M320-S
```

show chassis hardware detail (M160 Router)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version   Part number   Serial number     Description
Chassis                                  101               M160
Midplane         REV 02    710-001245    S/N AB4107
FPM CMB          REV 01    710-001642    S/N AA2911
FPM Display      REV 01    710-001647    S/N AA2999
CIP              REV 02    710-001593    S/N AA9563
PEM 0            Rev 01    740-001243    S/N KJ35769       DC
PEM 1            Rev 01    740-001243    S/N KJ35765       DC
PCG 0            REV 01    710-001568    S/N AA9794
PCG 1            REV 01    710-001568    S/N AA9804
Host 1                                   da000004f8d57001  teknor
MCS 1            REV 03    710-001226    S/N AA9777
SFM 0 SPP        REV 04    710-001228    S/N AA2975
SFM 0 SPR        REV 02    710-001224    S/N AA9838        Internet Processor I
  SSRAM bank 0   REV 01    710-000077    S/N 306456        1 MB
  SSRAM bank 1   REV 01    710-000077    S/N 306474        1 MB
  SSRAM bank 2   REV 01    710-000077    S/N 306388        1 MB
  SSRAM bank 3   REV 01    710-000077    S/N 306392        1 MB
SFM 1 SPP        REV 04    710-001228    S/N AA2860
```



```
SFM 1 SPR        REV 01   710-001224   S/N AB0139        Internet Processor I
  SSRAM bank 0   REV 01   710-000077   S/N 302917        1 MB
  SSRAM bank 1   REV 01   710-000077   S/N 302662        1 MB
  SSRAM bank 2   REV 01   710-000077   S/N 302593        1 MB
  SSRAM bank 3   REV 01   710-000077   S/N 100160        1 MB
FPC 0            REV 03   710-001255   S/N AA9806        FPC Type 1
  CPU            REV 02   710-001217   S/N AA9590
  SSRAM          REV 01   710-000077   S/N 302836        1 MB
  SDRAM 0        REV 01   710-001196   S00141            32 MB
  SDRAM 1        REV 01   710-001196   S0010;            32 MB
  SSRAM          REV 01   710-000077   S/N 302633        1 MB
  SDRAM 0        REV 01   710-001196   S00143            32 MB
  SDRAM 1        REV 01   710-001196   S00115            32 MB
  SSRAM          REV 01   710-000077   S/N 302952        1 MB
  SDRAM 0        REV 01   710-001196   S00135            32 MB
  SDRAM 1        REV 01   710-001196   S001=3            32 MB
  SSRAM          REV 01   710-000077   S/N 302892        1 MB
  SDRAM 0        REV 01   710-001196   S000?6            32 MB
  SDRAM 1        REV 01   710-001196   S001=5            32 MB
  PIC 1          REV 05   750-000616   S/N AA1527        1x OC-12 ATM, MM
  PIC 2          REV 05   750-000616   S/N AA1535        1x OC-12 ATM, MM
  PIC 3          REV 01   750-000616   S/N AA1519        1x OC-12 ATM, MM
FPC 1            REV 02   710-001611   S/N AA9523        FPC Type 2
  CPU            REV 02   710-001217   S/N AA9571
  SSRAM          REV 01   710-000077   S/N 306340        1 MB
  SDRAM 0        REV 01   710-001196   S00012            32 MB
  SDRAM 1        REV 01   710-001196   S0001?            32 MB
  SSRAM          REV 01   710-000077   S/N 306454        1 MB
  SDRAM 0        REV 01   710-001196   S00028            32 MB
  SDRAM 1        REV 01   710-001196   S0002?            32 MB
  SSRAM          REV 01   710-000077   S/N 306492        1 MB
  SDRAM 0        REV 01   710-001196   S00015            32 MB
  SDRAM 1        REV 01   710-001196   S00031            32 MB
  SSRAM          REV 01   710-000077   S/N 306363        1 MB
  SDRAM 0        REV 01   710-001196   S00013            32 MB
  SDRAM 1        REV 01   710-001196   S00032            32 MB
  PIC 0          REV 03   750-001900   S/N AA9626        1x STM-16 SDH, SMIR
  PIC 1          REV 01   710-002381   S/N AD3633        2x G/E, 1000 BASE-SX
FPC 2                                                    FPC Type OC192
... SSRAM          REV 01   710-000077   S/N 306466        1 MB
```

show chassis hardware (M320 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                67245             M320
Midplane         REV 05   710-009120   RB1202            M320 Midplane
FPM GBUS         REV 04   710-005928   HZ5697            M320 Board
FPM Display      REV 05   710-009351   HR1464            M320 FPM Display
CIP              REV 04   710-005926   HT8672            M320 CIP
PEM 0            Rev 05   740-009148   QK34208           DC Power Entry Module
PEM 1            Rev 05   740-009148   QK34262           DC Power Entry Module
PEM 2            Rev 05   740-009148   QF10449           DC Power Entry Module
PEM 3            Rev 05   740-009148   QJ18257           DC Power Entry Module
Routing Engine 0 REV 06   740-008883   P11123901185      RE-4.0
CB 0             REV 07   710-009115   JB2382            M320 Control Board
FPC 0            REV 02   710-005017   CD9926            M320 FPC Type 2
  CPU            REV 01   710-011659   CJ6940            M320 PCA SCPU
  PIC 0          REV 07   750-001900   AT1594            1x OC-48 SONET, SMSR
  PIC 1          REV 03   750-001850   HS2746            1x Tunnel
```

```
  PIC 2           REV 05   750-010618   JE7117           4x G/E SFP, 1000 BASE
  PIC 3           REV 06   750-001900   HE6083           1x OC-48 SONET, SMSR
FPC 2             REV 02   710-005017   CH0319           M320 FPC Type 1
  CPU             REV 01   710-011659   CJ6942           M320 PCA SCPU
  PIC 0           REV 05   750-003034   BD8705           4x OC-3 SONET, SMIR
FPC 5             REV 02   710-005017   CD9938           M320 FPC Type 2
  CPU
FPC 7             REV 02   710-005017   CD9934           M320 FPC Type 2
  CPU
SIB 0             REV 09   710-009184   JA6540           M320 SIB
SIB 1             REV 09   710-009184   HV9511           M320 SIB
SIB 2             REV 09   710-009184   HW2057           M320 SIB
SIB 3             REV 09   710-009184   JA6687           M320 SIB
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
Fan Tray 2                                               Rear Fan Tray
```

show chassis hardware models (M320 Router)

```
user@host> show chassis hardware models
Hardware inventory:
Item              Version  Part number  CLEI code        FRU model number
Midplane          REV 03   710-009120                    CHAS-BP-M320-S
FPM Display       REV 02   710-009351                    CRAFT-M320-S
CIP               REV 03   710-005926                    CIP-M320-S
PEM 2             Rev X4   740-009148                    PWR-M-DC-S
PEM 3             Rev X4   740-009148                    PWR-M-DC-S
Routing Engine 0  REV 02   740-008883                    RE-1600-2048-S
Routing Engine 1  REV 02   740-008883                    RE-1600-2048-S
FPC 0             REV 02   710-010419                    M320-FPC1
  PIC 0           REV 01   750-001323                    P-TUNNEL
  PIC 1           REV 02   750-002987                    PE-1OC12-SON-SMIR
  PIC 2           REV 04   750-001894                    PB-1GE-SX
  PIC 3           REV 04   750-001896                    PB-1OC12-SON-SMIR
FPC 1             REV 02   710-010419                    M320-FPC1
  PIC 0           REV 04   750-001894                    PB-1GE-SX
  PIC 1           REV 04   750-001894                    PB-1GE-SX
  PIC 3           REV 03   750-001894                    PB-1GE-SX
FPC 2             REV 02   710-010419                    M320-FPC1
  PIC 0           REV 10   750-005634                    PB-1CHOC12SMIR-QPP
  PIC 1           REV 10   750-005634                    PB-1CHOC12SMIR-QPP
  PIC 2           REV 07   750-005634                    PB-1CHOC12SMIR-QPP
  PIC 3           REV 07   750-005634                    PB-1CHOC12SMIR-QPP
  PIC 1           REV 10   750-005634                    PB-1CHOC12SMIR-QPP
  PIC 2           REV 07   750-005634                    PB-1CHOC12SMIR-QPP
  PIC 3           REV 07   750-005634                    PB-1CHOC12SMIR-QPP
FPC 3
  PIC 0           REV 03   750-001895                    PB-1OC12-SON-MM
  PIC 1           REV 04   750-001894                    PB-1GE-SX
  PIC 3           REV 04   750-003141                    PB-1GE-SX-B
FPC 4             REV 02   710-010419                    M320-FPC1
FPC 5             REV 02   710-010419                    M320-FPC1
FPC 6             REV 02   710-010419                    M320-FPC1
FPC 7
  PIC 0           REV 15   750-001901                    PB-4OC12-SON-SMIR
  PIC 1           REV 06   750-001900                    PB-1OC48-SON-SMSR
  PIC 2           REV 07   750-001900                    PB-1OC48-SON-SMSR
  PIC 3           REV 05   750-003737                    PB-4GE-SX
SIB 0             REV 03   710-009184                    SIB-M-S
SIB 1             REV 03   710-009184                    SIB-M-S
SIB 2             REV 03   710-009184                    SIB-M-S
```



```
SIB 3           REV 03   710-009184                      SIB-M-S
Fan Tray 0                                               FFANTRAY-M320-S
Fan Tray 1                                               FFANTRAY-M320-S
Fan Tray 2                                               RFANTRAY-M320-S
```

show chassis hardware (MX5 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                E1368             MX5-T
Midplane         REV 01   711-038215   YF5288            MX5-T
PEM 0            Rev 04   740-028288   VA01215           AC Power Entry Module
PEM 1            Rev 04   740-028288   VA01218           AC Power Entry Module
Routing Engine            BUILTIN      BUILTIN           Routing Engine
TFEB 0                    BUILTIN      BUILTIN           Forwarding Engine
Processor
  QXM 0          REV 05   711-028408   ZA9136            MPC QXM
FPC 0                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0                   BUILTIN      BUILTIN           4x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN           4x 10GE XFP
FPC 1                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0          REV 24   750-028392   YX9820            3D 20x 1GE(LAN) SFP
    PIC 0                 BUILTIN      BUILTIN           10x 1GE(LAN) SFP
      Xcvr 0     REV 01   740-031851   AM1045SUAQ3       SFP-SX
      Xcvr 1     REV 01   740-031851   AM1045SUAPA       SFP-SX
      Xcvr 2     REV 01   740-031851   AM1045SUAN7       SFP-SX
      Xcvr 3     REV 01   740-031851   AM1045SU91Q       SFP-SX
      Xcvr 4     REV 01   740-031851   AM1045SUDDR       SFP-SX
      Xcvr 9     REV 01   740-011613   AM0848SB6A1       SFP-SX
    PIC 1                 BUILTIN      BUILTIN           10x 1GE(LAN) SFP
      Xcvr 0     REV 01   740-031851   AM1045SUAN0       SFP-SX
      Xcvr 1     REV 01   740-011613   AS0812S0719       SFP-SX
      Xcvr 2     REV 01   740-011613   AM0821SA121       SFP-SX
      Xcvr 3     REV 01   740-011613   PF21K21           SFP-SX
      Xcvr 4     REV 01   740-011613   AM0848SB69Z       SFP-SX
      Xcvr 5     REV 01   740-011782   P9P0XV3           SFP-SX
      Xcvr 6     REV 01   740-011613   AM0812S8WJN       SFP-SX
      Xcvr 7     REV 01   740-011613   PAM3G9Q           SFP-SX
      Xcvr 8     REV 01   740-011613   AM0848SB4A6       SFP-SX
      Xcvr 9     REV 01   740-011782   P9M0U37           SFP-SX
  MIC 1          REV 20   750-028380   ZG2657            3D 2x 10GE XFP
    PIC 2                 BUILTIN      BUILTIN           1x 10GE XFP
    PIC 3                 BUILTIN      BUILTIN           1x 10GE XFP
Fan Tray                                                 Fan Tray
```

show chassis hardware (MX10 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                E1372             MX10-T
Midplane         REV 01   711-038211   YF5285            MX10-T
PEM 0            Rev 04   740-028288   VB01678           AC Power Entry Module
Routing Engine            BUILTIN      BUILTIN           Routing Engine
TFEB 0                    BUILTIN      BUILTIN           Forwarding Engine
Processor
  QXM 0          REV 05   711-028408   ZA9053            MPC QXM
FPC 0                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0                   BUILTIN      BUILTIN           4x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN           4x 10GE XFP
```

```
FPC 1                        BUILTIN      BUILTIN          MPC BUILTIN
  MIC 0           REV 24     750-028392   YX9436           3D 20x 1GE(LAN) SFP
    PIC 0                    BUILTIN      BUILTIN          10x 1GE(LAN) SFP
      Xcvr 0      REV 01     740-031851   AM1107SUFQW      SFP-SX
    PIC 1                    BUILTIN      BUILTIN          10x 1GE(LAN) SFP
Fan Tray                                                   Fan Tray
```

show chassis hardware (MX40 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version    Part number  Serial number    Description
Chassis                                   E1367            MX40-T
Midplane          REV 01     711-038211   YF5284           MX40-T
PEM 0             Rev 04     740-028288   VB01680          AC Power Entry Module
PEM 1             Rev 04     740-028288   VB01700          AC Power Entry Module
Routing Engine               BUILTIN      BUILTIN          Routing Engine
TFEB 0                       BUILTIN      BUILTIN          Forwarding Engine
Processor
  QXM 0           REV 05     711-028408   ZA9048           MPC QXM
FPC 0                        BUILTIN      BUILTIN          MPC BUILTIN
  MIC 0                      BUILTIN      BUILTIN          4x 10GE XFP
    PIC 0                    BUILTIN      BUILTIN          4x 10GE XFP
      Xcvr 0      REV 01     740-014279   M7067UPP         XFP-10G-LR
      Xcvr 1                 NON-JNPR     K9J02UN          XFP-10G-LR
FPC 1                        BUILTIN      BUILTIN          MPC BUILTIN
  MIC 0           REV 24     750-028392   YX3504           3D 20x 1GE(LAN) SFP
    PIC 0                    BUILTIN      BUILTIN          10x 1GE(LAN) SFP
      Xcvr 0      REV 01     740-011613   AM0812S8WTE      SFP-SX
      Xcvr 1      REV 01     740-011613   PFA6KV2          SFP-SX
      Xcvr 2      REV 01     740-031851   AM1045SUDDM      SFP-SX
      Xcvr 3      REV 01     740-011613   PD63C7M          SFP-SX
      Xcvr 4      REV 01     740-011613   PD63DJY          SFP-SX
      Xcvr 5      REV 02     740-011613   AA0950STLL9      SFP-SX
      Xcvr 6      REV 01     740-011782   PAR1YHC          SFP-SX
      Xcvr 7      REV 01     740-011782   P9P0XXL          SFP-SX
      Xcvr 8      REV 01     740-011613   PD63D95          SFP-SX
      Xcvr 9      REV 01     740-031851   AM1045SU9B8      SFP-SX
    PIC 1                    BUILTIN      BUILTIN          10x 1GE(LAN) SFP
      Xcvr 0      REV 01     740-011613   PF21L3Z          SFP-SX
      Xcvr 1      REV 01     740-031851   AM1045SU7M9      SFP-SX
      Xcvr 2      REV 01     740-031851   AM1045SUAPT      SFP-SX
      Xcvr 3      REV 01     740-011613   PFF2BZH          SFP-SX
      Xcvr 4      REV 01     740-031851   AM1045SUDDN      SFP-SX
      Xcvr 5      REV 01     740-031851   AM1039S00ZR      SFP-SX
      Xcvr 6      REV 01     740-031851   AM1045SUD6Y      SFP-SX
      Xcvr 8      REV 01     740-011613   PFM1QBS          SFP-SX
      Xcvr 9      REV 01     740-011613   PFF2E25          SFP-SX
  MIC 1           REV 01     750-021130   KG4391           3D 2x 10GE XFP
    PIC 2                    BUILTIN      BUILTIN          1x 10GE XFP
      Xcvr 0      REV 01     740-011571   C645XJ04G        XFP-10G-SR
    PIC 3                    BUILTIN      BUILTIN          1x 10GE XFP
      Xcvr 0                 NON-JNPR     CA49BK0AE        XFP-10G-SR
Fan Tray                                                   Fan Tray
```

show chassis hardware (Fixed MX80 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version    Part number  Serial number    Description
Chassis                                                    MX80-48T
```



```
Midplane         REV 01   711-031603   KF9250           MX80-48T
Routing Engine            BUILTIN      BUILTIN          Routing Engine
FEB 0                     BUILTIN      BUILTIN          Forwarding Engine Board
FPC 0                     BUILTIN      BUILTIN          MPC BUILTIN
  MIC 0                   BUILTIN      BUILTIN          4x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN          4x 10GE XFP
      Xcvr 0              NON-JNPR     M6439D41         XFP-10G-LR
      Xcvr 1     REV 01   740-014279   6XE931N00202     XFP-10G-LR
      Xcvr 2     REV 01   740-014289   C715XU05F        XFP-10G-SR
      Xcvr 3     REV 01   740-014289   C650XU0EP        XFP-10G-SR
FPC 1                     BUILTIN      BUILTIN          MPC BUILTIN
  MIC 0          REV 01   711-029399   JR6981           12x 1GE(LAN) RJ45
    PIC 0                 BUILTIN      BUILTIN          12x 1GE(LAN) RJ45
    PIC 1                 BUILTIN      BUILTIN          12x 1GE(LAN) RJ45
  MIC 1          REV 01   BUILTIN      BUILTIN          12x 1GE(LAN) RJ45
    PIC 2                 BUILTIN      BUILTIN          12x 1GE(LAN) RJ45
    PIC 3                 BUILTIN      BUILTIN          12x 1GE(LAN) RJ45
Fan Tray                                                Fan Tray
```

show chassis hardware (Modular MX80 Router)

```
user@host> show chassis hardware

Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                                 MX80
Midplane         REV 02   711-031594   JR7084           MX80
PEM 0            Rev 01   740-028288   000018           AC Power Entry Module
Routing Engine            BUILTIN      BUILTIN          Routing Engine
FEB 0                     BUILTIN      BUILTIN          Forwarding Engine Board

  QXM 0          REV 05   711-028408   JR7041           MPC QXM
FPC 0                     BUILTIN      BUILTIN          MPC BUILTIN
  MIC 0                   BUILTIN      BUILTIN          4x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN          4x 10GE XFP
FPC 1                     BUILTIN      BUILTIN          MPC BUILTIN
  MIC 0          REV 02   750-028380   JR6598           3D 2x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN          1x 10GE XFP
      Xcvr 0     REV 01   740-014289   T07M86365        XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN          1x 10GE XFP
      Xcvr 0     REV 01   740-014289   T07M71094        XFP-10G-SR
  MIC 1          REV 02   750-028380   JG8548           3D 2x 10GE XFP
    PIC 2                 BUILTIN      BUILTIN          1x 10GE XFP
      Xcvr 0     REV 02   740-014289   T08L86302        XFP-10G-SR
    PIC 3                 BUILTIN      BUILTIN          1x 10GE XFP
      Xcvr 0     REV 02   740-014289   C810XU0BA        XFP-10G-SR
Fan Tray                                                Fan Tray
```

show chassis hardware (MX104 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                G3503            MX104
Midplane         REV 28   750-044219   CAAX5741         MX104
PEM 0            REV 03   740-045933   1H072500016      AC Power Entry Module
PEM 1            REV 03   740-045932   1H073050017      DC Power Entry Module
Routing Engine 0 REV 20   750-044228   CAAY7935         RE-MX-104
Routing Engine 1 REV 13   750-044228   CAAM6380         RE-MX-104
AFEB 0                    BUILTIN      BUILTIN          Forwarding Engine
Processor
```

```
FPC 0                        BUILTIN      BUILTIN           MPC BUILTIN
FPC 1                        BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0           REV 15     750-036132   CAAF7948          2xOC12/8xOC3 CC-CE
    PIC 0                    BUILTIN      BUILTIN           2xOC12/8xOC3 CC-CE
      Xcvr 0      REV 01     740-011615   PCQ0U2J           SFP-IR
      Xcvr 1      REV 01     740-016068   PJL7A6G           SFP-SR
      Xcvr 2      REV 01     740-016068   PJL7A5J           SFP-SR
      Xcvr 3      REV 01     740-016065   PJN5HPZ           SFP-SR
      Xcvr 4      REV 01     740-029122   PKB38TL           SFP-LR
      Xcvr 5      REV 01     740-011787   P6A107G           SFP-LR
      Xcvr 6      REV 01     740-029122   PKB38TR           SFP-LR
      Xcvr 7      REV 01     740-011787   PBK0NK3           SFP-LR
  MIC 1
FPC 2                        BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0                      BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    PIC 0                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01     740-031980   B10F00465         SFP+-10G-SR
      Xcvr 1      REV 01     740-031980   B10F00461         SFP+-10G-SR
      Xcvr 2      REV 01     740-031980   B10G01545         SFP+-10G-SR
      Xcvr 3      REV 01     740-031980   B10G01385         SFP+-10G-SR
Fan Tray 0        REV 02     711-049570   CAAX6538          Fan Tray
```

show chassis hardware detail (MX104 Router)

```
user@host> show chassis hardware detail
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 G3503             MX104
Midplane          REV 28   750-044219   CAAX5741          MX104
PEM 0             REV 03   740-045933   1H072500016       AC Power Entry Module
PEM 1             REV 03   740-045932   1H073050017       DC Power Entry Module
Routing Engine 0 REV 20    750-044228   CAAY7935          RE-MX-104
  da0     7836 MB  ATP IG eUSB SSD                        Nand Flash 0
  usb0 (addr 1)  EHCI root hub 0        Freescale         uhub0
  usb0 (addr 2)  USB2513Bi  9491        SMSC              uhub1
  usb0 (addr 3)  ATP IG eUSB SSD 44801 ATP Electronics    umass0
Routing Engine 1 REV 13    750-044228   CAAM6380          RE-MX-104
  da0     7836 MB  ATP IG eUSB SSD                        Nand Flash 0
AFEB 0                     BUILTIN      BUILTIN           Forwarding Engine
Processor
FPC 0                      BUILTIN      BUILTIN           MPC BUILTIN
FPC 1                      BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0           REV 15   750-036132   CAAF7948          2xOC12/8xOC3 CC-CE
    PIC 0                  BUILTIN      BUILTIN           2xOC12/8xOC3 CC-CE
      Xcvr 0      REV 01   740-011615   PCQ0U2J           SFP-IR
      Xcvr 1      REV 01   740-016068   PJL7A6G           SFP-SR
      Xcvr 2      REV 01   740-016068   PJL7A5J           SFP-SR
      Xcvr 3      REV 01   740-016065   PJN5HPZ           SFP-SR
      Xcvr 4      REV 01   740-029122   PKB38TL           SFP-LR
      Xcvr 5      REV 01   740-011787   P6A107G           SFP-LR
      Xcvr 6      REV 01   740-029122   PKB38TR           SFP-LR
      Xcvr 7      REV 01   740-011787   PBK0NK3           SFP-LR
  MIC 1
FPC 2                      BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    PIC 0                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   B10F00465         SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   B10F00461         SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   B10G01545         SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   B10G01385         SFP+-10G-SR
Fan Tray 0        REV 02   711-049570   CAAX6538          Fan Tray
```


show chassis hardware extensive (MX104 Router)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                G3503             MX104
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
                                 S/N:               G3503
 Assembly ID:  0x0560            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: MX104
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 60 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 47 33 35 30 33 00 00 00 00 00 00 00 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 28   750-044219   CAAX5741          MX104
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-044219        S/N:               CAAX5741
 Assembly ID:  0x0560            Assembly Version:  01.28
 Date:         03-27-2013        Assembly Flags:    0x00
 Version:      REV 28            CLEI Code:         PROTOXCLEI
 ID: MX104                       FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ad 01 08 00 b0 a8 6e a7 f8 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 60 01 1c 52 45 56 20 32 38 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 31 39 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 58 35 37 34 31 00 1b 03 07
  Address 0x30: dd ff ff ff ad 01 08 00 b0 a8 6e a7 f8 00 ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 47 33 35 30 33 00 00 00 00 00 00 00
PEM 0            REV 03   740-045933   1H072500016       AC Power Entry Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-045933        S/N:               1H072500016
 Assembly ID:  0x0475            Assembly Version:  00.03
 Date:         12-14-2012        Assembly Flags:    0x00
 Version:      REV 03            CLEI Code:         IPUPAJ9KAA
 ID: AC Power Entry Module       FRU Model Number:  PWR-AMX1100-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 02 02 00 ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 75 00 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 39 33 33 00 00
  Address 0x20: 31 48 30 37 32 35 30 30 30 31 36 00 00 0e 0c 07
  Address 0x30: dc 30 43 ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 02 02 00 ff 01 49 50 55 50 41 4a 39 4b 41 41 50
  Address 0x50: 57 52 2d 41 4d 58 31 31 30 30 2d 41 43 2d 53 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 70 ff ff ff ff ff ff ff ff ff ff ff ff
PEM 1            REV 03   740-045932   1H073050017       DC Power Entry Module
Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-045932        S/N:               1H073050017
```

```
 Assembly ID:  0x0476           Assembly Version:  00.03
 Date:         01-30-2013       Assembly Flags:    0x00
 Version:      REV 03           CLEI Code:         IPUPAJ8KAA
 ID: DC Power Entry Module      FRU Model Number:  PWR-AMX1100-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 02 02 00 ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 76 00 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 39 33 32 00 00
  Address 0x20: 31 48 30 37 33 30 35 30 30 31 37 00 00 1e 01 07
  Address 0x30: dd 30 44 ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 02 02 00 ff 01 49 50 55 50 41 4a 38 4b 41 41 50
  Address 0x50: 57 52 2d 41 4d 58 31 31 30 30 2d 44 43 2d 53 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 72 ff ff ff ff ff ff ff ff ff ff ff ff
Routing Engine 0 REV 20   750-044228   CAAY7935         RE-MX-104
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          750-044228       S/N:               CAAY7935
 Assembly ID:  0x0b81           Assembly Version:  01.20
 Date:         03-18-2013       Assembly Flags:    0x00
 Version:      REV 20           CLEI Code:         PROTOXCLEI
 ID: RE-MX-104                  FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ad 01 00 08 b0 a8 6e a6 fc 10 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0b 81 01 14 52 45 56 20 32 30 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 32 38 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 59 37 39 33 35 00 12 03 07
  Address 0x30: dd ff ff ff ad 01 00 08 b0 a8 6e a6 fc 10 ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
  da0    7836 MB  ATP IG eUSB SSD                        Nand Flash 0
  usb0 (addr 1)  EHCI root hub 0       Freescale         uhub0
  usb0 (addr 2)  USB2513Bi  9491       SMSC              uhub1
  usb0 (addr 3)  ATP IG eUSB SSD 44801 ATP Electronics   umass0
Routing Engine 1 REV 13   750-044228   CAAM6380         RE-MX-104
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          750-044228       S/N:               CAAM6380
 Assembly ID:  0x0b81           Assembly Version:  01.13
 Date:         09-17-2012       Assembly Flags:    0x00
 Version:      REV 13           CLEI Code:         PROTOXCLEI
 ID: RE-MX-104                  FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ad 01 00 08 64 87 88 27 08 18 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0b 81 01 0d 52 45 56 20 31 33 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 32 38 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 4d 36 33 38 30 00 11 09 07
  Address 0x30: dc ff ff ff ad 01 00 08 64 87 88 27 08 18 ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
  da0    7836 MB  ATP IG eUSB SSD                        Nand Flash 0
AFEB 0                    BUILTIN      BUILTIN           Forwarding Engine
Processor
FPC 0                     BUILTIN      BUILTIN           MPC BUILTIN
FPC 1                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0          REV 15   750-036132   CAAF7948          2xOC12/8xOC3 CC-CE
```

```
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          750-036132       S/N:               CAAF7948
 Assembly ID:  0x0a1a           Assembly Version:  01.15
 Date:         07-03-2012       Assembly Flags:    0x00
 Version:      REV 15           CLEI Code:         IP9IAM2DAA
 ID: 2xOC12/8xOC3 CC-CE         FRU Model Number:  MIC-3D-8OC3-2OC12-ATM
 Board Information Record:
  Address 0x00: 12 01 05 03 05 ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0a 1a 01 0f 52 45 56 20 31 35 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 36 31 33 32 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 46 37 39 34 38 00 03 07 07
  Address 0x30: dc ff ff ff 12 01 05 03 05 ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 39 49 41 4d 32 44 41 41 4d
  Address 0x50: 49 43 2d 33 44 2d 38 4f 43 33 2d 32 4f 43 31 32
  Address 0x60: 2d 41 54 4d 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff e3 c0 02 a3 9c 00 00 00 00 0a 60 00 00
    PIC 0                 BUILTIN      BUILTIN           2xOC12/8xOC3 CC-CE
      Xcvr 0     REV 01   740-011615   PCQ0U2J           SFP-IR
      Xcvr 1     REV 01   740-016068   PJL7A6G           SFP-SR
      Xcvr 2     REV 01   740-016068   PJL7A5J           SFP-SR
      Xcvr 3     REV 01   740-016065   PJN5HPZ           SFP-SR
      Xcvr 4     REV 01   740-029122   PKB38TL           SFP-LR
      Xcvr 5     REV 01   740-011787   P6A107G           SFP-LR
      Xcvr 6     REV 01   740-029122   PKB38TR           SFP-LR
      Xcvr 7     REV 01   740-011787   PBK0NK3           SFP-LR
  MIC 1
FPC 2                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
 Jedec Code:   0x0000           EEPROM Version:    0x00
 P/N:          BUILTIN          S/N:               BUILTIN
 Assembly ID:  0x0a60           Assembly Version:  00.00
 Date:         00-00-0000       Assembly Flags:    0x00
 ID: 4x 10GE(LAN) SFP+
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 0a 60 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 4d 58 43 00
  Address 0x20: 42 55 49 4c 54 49 4e 00 4d 58 43 00 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 c0 02 a5 04 7f b0 02 ff 0a 1a 01 0f
    PIC 0                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0     REV 01   740-031980   B10F00465         SFP+-10G-SR
      Xcvr 1     REV 01   740-031980   B10F00461         SFP+-10G-SR
      Xcvr 2     REV 01   740-031980   B10G01545         SFP+-10G-SR
      Xcvr 3     REV 01   740-031980   B10G01385         SFP+-10G-SR
Fan Tray 0       REV 02   711-049570   CAAX6538          Fan Tray
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          711-049570       S/N:               CAAX6538
 Assembly ID:  0x0b82           Assembly Version:  01.02
 Date:         03-01-2013       Assembly Flags:    0x00
 Version:      REV 02           CLEI Code:         PROTOXCLEI
 ID: Fan Tray                   FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 82 01 02 52 45 56 20 30 32 00 00
```

```
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 39 35 37 30 00 00
Address 0x20: 53 2f 4e 20 43 41 41 58 36 35 33 38 00 01 03 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
```

show chassis hardware models (MX104 Router)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 20   750-044219   CAAS5849          PROTO-ASSEMBLY
PEM 0            REV 01   740-045932   1H072400065
Routing Engine 0 REV 16   750-044228   CAAR5915          PROTO-ASSEMBLY
AFEB 0                    BUILTIN      BUILTIN
FPC 0                     BUILTIN      BUILTIN
FPC 1                     BUILTIN      BUILTIN
  MIC 0          REV 01   750-046905   CAAK7103          MIC-3D-20GE-SFP-EH
FPC 2                     BUILTIN      BUILTIN
Fan Tray         REV 02   711-049570   CAAX6538          PROTO-ASSEMBLY
```

show chassis hardware clei-models (MX104 Router)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 20   750-044219   PROTOXCLEI        PROTO-ASSEMBLY
PEM 0            REV 01   740-045932
Routing Engine 0 REV 16   750-044228   PROTOXCLEI        PROTO-ASSEMBLY
AFEB 0                    BUILTIN
FPC 0                     BUILTIN
FPC 1                     BUILTIN
  MIC 0          REV 01   750-046905   PROTOXCLEI        MIC-3D-20GE-SFP-EH
FPC 2                     BUILTIN
Fan Tray        REV 02   711-049570   CAAX6538          PROTO-ASSEMBLY
```

show chassis hardware (MX240 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN10C7F7EAFC      MX240
Midplane         REV 01   710-021041   TR1502            MX240 Backplane
FPM Board        REV 01   710-017254   KD4017            Front Panel Display
PEM 0            Rev 02   740-017330   000332            PS 1.2-1.7kW; 100-240V
AC in
PEM 1            Rev 02   740-017330   000226            PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 06   740-013063   1000703522        RE-S-2000
Routing Engine 1 REV 06   740-015113   1000687625        RE-S-1300
CB 0             REV 07   710-013385   KC9057            MX SCB
CB 1             REV 05   710-013385   JY4760            MX SCB
FPC 1            REV 01   750-021679   KC7340            DPCE 40x 1GE R
  CPU            REV 06   710-013713   KD4078            DPC PMB
  PIC 0                   BUILTIN      BUILTIN           10x 1GE(LAN)
    Xcvr 0       REV 01   740-011613   P9F18ME           SFP-SX
  PIC 1                   BUILTIN      BUILTIN           10x 1GE(LAN)
  PIC 2                   BUILTIN      BUILTIN           10x 1GE(LAN)
  PIC 3                   BUILTIN      BUILTIN           10x 1GE(LAN)
FPC 2            REV 04   710-016669   JS4529            DPCE 40x 1GE R EQ
```



```
  CPU           REV 06   710-013713   KB3969           DPC PMB
  PIC 0                  BUILTIN      BUILTIN          10x 1GE(LAN) EQ
    Xcvr 0      REV 01   740-011613   PBG3Y79          SFP-SX
    Xcvr 1      REV 01   740-011613   PBG3XU8          SFP-SX
    Xcvr 2      REV 01   740-011613   PBG3YG6          SFP-SX
    Xcvr 3      REV 01   740-011613   PBG3XUG          SFP-SX
    Xcvr 4      REV 01   740-011613   PBG3XTJ          SFP-SX
  PIC 1                  BUILTIN      BUILTIN          10x 1GE(LAN) EQ
    Xcvr 0      REV 01   740-011613   PBG3ZUM          SFP-SX
    Xcvr 1      REV 01   740-011613   PBG3Y5H          SFP-SX
    Xcvr 2      REV 01   740-011613   PBG3UZT          SFP-SX
    Xcvr 3      REV 01   740-011613   PBG3US1          SFP-SX
  PIC 2                  BUILTIN      BUILTIN          10x 1GE(LAN) EQ
    Xcvr 0      REV 01   740-011613   PBG3YG7          SFP-SX
    Xcvr 1      REV 01   740-011613   PBG3XZ9          SFP-SX
    Xcvr 2      REV 01   740-011613   PBG3XTY          SFP-SX
    Xcvr 3      REV 01   740-011613   PBG3UZG          SFP-SX
  PIC 3                  BUILTIN      BUILTIN          10x 1GE(LAN) EQ
    Xcvr 0      REV 01   740-011613   PBG3Y8W          SFP-SX
    Xcvr 1      REV 01   740-011613   PBG3YVX          SFP-SX
    Xcvr 2      REV 01   740-011613   PBG3YB3          SFP-SX
    Xcvr 3      REV 01   740-011613   PBG43VQ          SFP-SX
Fan Tray 0      REV 01   710-021113   JS4642           MX240 Fan Tray
```

show chassis hardware detail (MX 240 Router with Routing Engine Displaying DIMM information)

user@host> **show chassis hardware detail**

```
Item            Version  Part number  Serial number    Description
Chassis                               JN11279B4AFC     MX240 Backplane
Midplane        REV 07   760-021404   TS2474           MX240 Backplane
FPM Board       REV 03   760-021392   XC2643           Front Panel Display
PEM 0           Rev 03   740-017343   QCS0908A068      DC Power Entry Module
Routing Engine 0 REV 01  740-031117   AARCH00          RE-S-1800x4
  ad0    3764 MB  STEC M2+ CF 9.0.2    STIM2Q3209239145303 Removable Compact Flash

  ad1   28626 MB  WDC SSD-F0030S-5000  C933Z036237215548S00 Compact Flash
  usb0 (addr 1)  EHCI root hub 0       Intel            uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087    uhub1
  DIMM 0         VL31B5263E-F8S DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 1         VL31B5263E-F8S DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 2         VL31B5263E-F8S DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 3         SL31B5263E-F8S DIE REV-0 PCB REV-0     MFR ID-ce80
CB 0            REV 03   710-021523   XD7225           MX SCB
Fan Tray 0      REV 01   710-021113   WZ4986           MX240 Fan Tray
```

show chassis hardware (MX240 Router with Enhanced MX SCB)

user@host> **show chassis hardware**

```
Hardware inventory:
Item            Version  Part number  Serial number    Description
Chassis                               JN10C7F7EAFC     MX240
Midplane        REV 01   710-021041   TR1502           MX240 Backplane
FPM Board       REV 01   710-017254   KD4017           Front Panel Display
PEM 0           Rev 02   740-017330   000332           PS 1.2-1.7kW; 100-240V
AC in
PEM 1           Rev 02   740-017330   000226           PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 06  740-013063   1000703522       RE-S-2000
Routing Engine 1 REV 06  740-015113   1000687625       RE-S-1300
CB 0            REV 02   710-031391   YE8494           Enhanced MX SCB
```

```
CB 1             REV 05   710-031391   YOP5764          Enhanced MX SCB
FPC 1            REV 01   750-021679   KC7340           DPCE 40x 1GE R
  CPU            REV 06   710-013713   KD4078           DPC PMB
  PIC 0                   BUILTIN      BUILTIN          10x 1GE(LAN)
    Xcvr 0       REV 01   740-011613   P9F18ME          SFP-SX
  PIC 1                   BUILTIN      BUILTIN          10x 1GE(LAN)
  PIC 2                   BUILTIN      BUILTIN          10x 1GE(LAN)
  PIC 3                   BUILTIN      BUILTIN          10x 1GE(LAN)
FPC 2            REV 04   710-016669   JS4529           DPCE 40x 1GE R EQ
  CPU            REV 06   710-013713   KB3969           DPC PMB
  PIC 0                   BUILTIN      BUILTIN          10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3Y79          SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3XU8          SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3YG6          SFP-SX
    Xcvr 3       REV 01   740-011613   PBG3XUG          SFP-SX
    Xcvr 4       REV 01   740-011613   PBG3XTJ          SFP-SX
  PIC 1                   BUILTIN      BUILTIN          10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3ZUM          SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3Y5H          SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3UZT          SFP-SX
    Xcvr 3       REV 01   740-011613   PBG3US1          SFP-SX
  PIC 2                   BUILTIN      BUILTIN          10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3YG7          SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3XZ9          SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3XTY          SFP-SX
    Xcvr 3       REV 01   740-011613   PBG3UZG          SFP-SX
  PIC 3                   BUILTIN      BUILTIN          10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3Y8W          SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3YVX          SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3YB3          SFP-SX
    Xcvr 3       REV 01   740-011613   PBG43VQ          SFP-SX
Fan Tray 0       REV 01   710-021113   JS4642           MX240 Fan Tray
```

show chassis hardware (MX480 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN10C7F7FAFB     MX480
Midplane         REV 04   710-017414   TR2071           MX480 Midplane
FPM Board        REV 02   710-017254   KB8459           Front Panel Display
PEM 0            Rev 02   740-017330  QCS07519029      PS 1.2-1.7kW; 100-240V
AC in
PEM 1            Rev 02   740-017330  QCS07519041      PS 1.2-1.7kW; 100-240V
AC in
PEM 2            Rev 02   740-017330  QCS07519097      PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 07   740-013063   1000733381       RE-S-2000
Routing Engine 1 REV 07   740-013063   1000733540       RE-S-2000
CB 0             REV 07   710-013385   KA8022           MX SCB
CB 1             REV 07   710-013385   KA8303           MX SCB
FPC 0            REV 09   750-020452   KA8660           DPCE 40x 1GE X EQ
  CPU            REV 06   710-013713   KA8185           DPC PMB
  PIC 0                   BUILTIN      BUILTIN          10x 1GE(LAN) EQ
  PIC 1                   BUILTIN      BUILTIN          10x 1GE(LAN) EQ
  PIC 2                   BUILTIN      BUILTIN          10x 1GE(LAN) EQ
  PIC 3                   BUILTIN      BUILTIN          10x 1GE(LAN) EQ
Fan Tray                                                Left Fan Tray
```


show chassis hardware (MX480 Router with Enhanced MX SCB)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN10C7F7FAFB      MX480
Midplane         REV 04   710-017414   TR2071            MX480 Midplane
FPM Board        REV 02   710-017254   KB8459            Front Panel Display
PEM 0            Rev 02   740-017330   QCS07519029       PS 1.2-1.7kW; 100-240V
AC in
PEM 1            Rev 02   740-017330   QCS07519041       PS 1.2-1.7kW; 100-240V
AC in
PEM 2            Rev 02   740-017330   QCS07519097       PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 07   740-013063   1000733381        RE-S-2000
Routing Engine 1 REV 07   740-013063   1000733540        RE-S-2000
CB 0             REV 07   710-013385   KA8022            Enhanced MX SCB
CB 1             REV 07   710-013385   KA8303            Enhanced MX SCB
FPC 0            REV 09   750-020452   KA8660            DPCE 40x 1GE X EQ
  CPU            REV 06   710-013713   KA8185            DPC PMB
  PIC 0                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 1                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 2                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 3                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
Fan Tray                                                 Left Fan Tray
```

show chassis hardware (MX480 Routers with MPC5E and built-in OTN PIC)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11C0338AFB      MX480
Midplane         REV 05   710-017414   ABAB8430          MX480 Midplane
FPM Board        REV 02   710-017254   ZS8005            Front Panel Display
PEM 0            Rev 05   740-029970   QCS1024U089       PS 1.4-2.52kW; 90-264V
AC in
PEM 1            Rev 10   740-029970   QCS1314U0FJ       PS 1.4-2.52kW; 90-264V
AC in
PEM 2            Rev 07   740-029970   QCS1121U076       PS 1.4-2.52kW; 90-264V
AC in
Routing Engine 0 REV 05   740-031116   9009092471        RE-S-1800x4
Routing Engine 1 REV 05   740-031116   9009097958        RE-S-1800x4
CB 0             REV 16   750-031391   CAAX0789          Enhanced MX SCB
CB 1             REV 16   750-031391   CAAX0856          Enhanced MX SCB
FPC 0            REV 32   750-028467   ABBP1782          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBP5410          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   983152A00038      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11F00211         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AQ72LPB           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AHN0WR5           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11J03627         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11F00300         SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ42WSS           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ43HGC           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   ANA0ND0           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   ANA0NGF           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   ANA0NG9           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   ANA0MP9           SFP+-10G-SR
```



```
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQA06CG          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   19T511100493     SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   APR040J          SFP+-10G-SR
FPC 1            REV 26   750-046005   CACN1894         MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACN8698         RMPC PMB
  PIC 0                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   163363A03046     SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ40JS8          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
  PIC 2                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   153363A00593     SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ40JUJ          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     UQC0B53          CFP2-100G-LR4-D
FPC 2            REV 26   750-046005   CACN1891         MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACN8694         RMPC PMB
  PIC 0                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0                NON-JNPR     URA012A          SFP+-10G-LR
  PIC 1                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     J13F47042        CFP2-100G-LR4-D
  PIC 2                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   AJC0BM3          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   11T511100917     SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     UQK07SU          CFP2-100G-LR4-D
FPC 3            REV 03   750-045372   CAAD9425         MPCE Type 3 3D
CPU            REV 08   711-035209   CAAD9094         HMPC PMB 2G
  MIC 0          REV 14   750-033196   CAAW9204         1X100GE CXP
    PIC 0                 BUILTIN      BUILTIN          1X100GE CXP
      Xcvr 0     REV 01   740-046563   XD16FC034        CFP2-100G-SR10
  MIC 1          REV 19   750-033199   CAAJ1814         1X100GE CFP
    PIC 2                 BUILTIN      BUILTIN          1X100GE CFP
FPC 4            REV 21.0.11 750-045715 CAAY3568        MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 07   711-045719   CAAW7430         RMPC PMB
  PIC 0                   BUILTIN      BUILTIN          12X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   AP406NG          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AR41NLP          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11D05630        SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          12X10GE SFPP OTN
  PIC 2                   BUILTIN      BUILTIN          3X40GE QSFPP
  PIC 3                   BUILTIN      BUILTIN          3X40GE QSFPP
  WAN MEZZ       REV 12   750-049136   CACM6678         MPC5E 24XGE OTN Mezz
FPC 5            REV 11   750-045372   CABK7539         MPCE Type 3 3D
  CPU            REV 08   711-035209   CABJ2466         HMPC PMB 2G
  MIC 0          REV 19   750-033199   CAAJ9719         1X100GE CFP
    PIC 0                 BUILTIN      BUILTIN          1X100GE CFP
      Xcvr 0     REV 01   740-035329   UP1020P          CFP-100G-SR10
  MIC 1          REV 07   750-033196   YZ0797           1X100GE CXP
    PIC 2                 BUILTIN      BUILTIN          1X100GE CXP
      Xcvr 0     REV 01   740-046563   XC42FC022        CFP2-100G-SR10
Fan Tray                                                Enhanced Left Fan Tray
```

show chassis hardware detail (MX480 Routers with MPC5E and built-in OTN PIC)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN11C0338AFB     MX480
Midplane         REV 05   710-017414   ABAB8430         MX480 Midplane
FPM Board        REV 02   710-017254   ZS8005           Front Panel Display
```

```
PEM 0            Rev 05   740-029970   QCS1024U089       PS 1.4-2.52kW; 90-264V
AC in
PEM 1            Rev 10   740-029970   QCS1314U0FJ       PS 1.4-2.52kW; 90-264V
AC in
PEM 2            Rev 07   740-029970   QCS1121U076       PS 1.4-2.52kW; 90-264V
AC in
Routing Engine 0 REV 05   740-031116   9009092471        RE-S-1800x4
  ad0    3896 MB  VRFCF14096DIHK1      VM4096MB 6862     Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-478612-001127 Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 05   740-031116   9009097958        RE-S-1800x4
  ad0    3896 MB  VRFCF14096DIHK1      VM4096MB 6145     Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000273 Disk 1
CB 0             REV 16   750-031391   CAAX0789          Enhanced MX SCB
CB 1             REV 16   750-031391   CAAX0856          Enhanced MX SCB
FPC 0            REV 32   750-028467   ABBP1782          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBP5410          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   983152A00038      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11F00211         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AQ72LPB           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AHN0WR5           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11J03627         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11F00300         SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ42WSS           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ43HGC           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   ANA0ND0           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   ANA0NGF           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   ANA0NG9           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   ANA0MP9           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQA06CG           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   19T511100493      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   APR040J           SFP+-10G-SR
FPC 1            REV 26   750-046005   CACN1894          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACN8698          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   163363A03046      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ40JS8           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   153363A00593      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ40JUJ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     UQC0B53           CFP2-100G-LR4-D
FPC 2            REV 26   750-046005   CACN1891          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACN8694          RMPC PMB
PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0                NON-JNPR     URA012A           SFP+-10G-LR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     J13F47042         CFP2-100G-LR4-D
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   AJC0BM3           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   11T511100917      SFP+-10G-SR
```



```
  PIC 3                      BUILTIN      BUILTIN            1X100GE CFP2 OTN
    Xcvr 0                   NON-JNPR     UQK07SU            CFP2-100G-LR4-D
FPC 3            REV 03      750-045372   CAAD9425           MPCE Type 3 3D
  CPU            REV 08      711-035209   CAAD9094           HMPC PMB 2G
  MIC 0          REV 14      750-033196   CAAW9204           1X100GE CXP
    PIC 0                    BUILTIN      BUILTIN            1X100GE CXP
      Xcvr 0     REV 01      740-046563   XD16FC034          CFP2-100G-SR10
  MIC 1          REV 19      750-033199   CAAJ1814           1X100GE CFP
    PIC 2                    BUILTIN      BUILTIN            1X100GE CFP
FPC 4            REV 21.0.11 750-045715 CAAY3568             MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 07      711-045719   CAAW7430           RMPC PMB
  PIC 0                      BUILTIN      BUILTIN            12X10GE SFPP OTN
    Xcvr 0       REV 01      740-031980   AP406NG            SFP+-10G-SR
    Xcvr 1       REV 01      740-021308   AR41NLP            SFP+-10G-SR
    Xcvr 2       REV 01      740-031980   B11D05630          SFP+-10G-SR
  PIC 1                      BUILTIN      BUILTIN            12X10GE SFPP OTN
  PIC 2                      BUILTIN      BUILTIN            3X40GE QSFPP
  PIC 3                      BUILTIN      BUILTIN            3X40GE QSFPP
  WAN MEZZ       REV 12      750-049136   CACM6678           MPC5E 24XGE OTN Mezz
FPC 5            REV 11      750-045372   CABK7539           MPCE Type 3 3D
  CPU            REV 08      711-035209   CABJ2466           HMPC PMB 2G
  MIC 0          REV 19      750-033199   CAAJ9719           1X100GE CFP
    PIC 0                    BUILTIN      BUILTIN            1X100GE CFP
      Xcvr 0     REV 01      740-035329   UP1020P            CFP-100G-SR10
  MIC 1          REV 07      750-033196   YZ0797             1X100GE CXP
    PIC 2                    BUILTIN      BUILTIN            1X100GE CXP
      Xcvr 0     REV 01      740-046563   XC42FC022          CFP2-100G-SR10
Fan Tray                                                     Enhanced Left Fan Tray
```

show chassis hardware extensive (MX480 Routers with MPC5E and built-in OTN PIC)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11C0338AFB      MX480
 Jedec Code:    0x7fb0            EEPROM Version:    0x02
                                  S/N:               JN11C0338AFB
 Assembly ID:   0x01fe            Assembly Version:  00.00
 Date:          00-00-0000        Assembly Flags:    0x02
 ID: MX480
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 01 fe 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 43 30 33 33 38 41 46 42 02 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 05   710-017414   ABAB8430          MX480 Midplane
 Jedec Code:    0x7fb0            EEPROM Version:    0x01
 P/N:           710-017414        S/N:               ABAB8430
 Assembly ID:   0x01fe            Assembly Version:  01.05
 Date:          12-13-2011        Assembly Flags:    0x00
 Version:       REV 05
 ID: MX480 Midplane               FRU Model Number:  CHAS-BP-MX480-S
 Board Information Record:
  Address 0x00: ad 01 08 00 00 23 9c fc 98 00 ff ff ff ff ff ff
```



```
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 01 fe 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 31 37 34 31 34 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 38 34 33 30 00 0d 0c 07
  Address 0x30: db ff ff ff ad 01 08 00 00 23 9c fc 98 00 ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
  Address 0x50: 48 41 53 2d 42 50 2d 4d 58 34 38 30 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 02   710-017254   ZS8005            Front Panel Display
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          710-017254        S/N:               ZS8005
 Assembly ID:  0x01ff            Assembly Version:  01.02
 Date:         11-21-2011        Assembly Flags:    0x00
 Version:      REV 02
 ID: Front Panel Display         FRU Model Number:  CRAFT-MX480-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 01 ff 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 31 37 32 35 34 00 00
  Address 0x20: 53 2f 4e 20 5a 53 38 30 30 35 00 00 00 15 0b 07
  Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
  Address 0x50: 52 41 46 54 2d 4d 58 34 38 30 2d 53 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PEM 0            Rev 05   740-029970   QCS1024U089       PS 1.4-2.52kW; 90-264V
AC in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-029970        S/N:               QCS1024U089
 Assembly ID:  0x0432            Assembly Version:  01.05
 Date:         06-17-2010        Assembly Flags:    0x00
 Version:      Rev 05
 ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number:  PWR-MX480-2520-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 32 01 05 52 65 76 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
  Address 0x20: 51 43 53 31 30 32 34 55 30 38 39 00 00 11 06 07
  Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 1            Rev 10   740-029970   QCS1314U0FJ       PS 1.4-2.52kW; 90-264V
AC in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-029970        S/N:               QCS1314U0FJ
 Assembly ID:  0x0432            Assembly Version:  01.10
 Date:         04-04-2013        Assembly Flags:    0x00
 Version:      Rev 10
 ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number:  PWR-MX480-2520-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 32 01 0a 52 65 76 20 31 30 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
  Address 0x20: 51 43 53 31 33 31 34 55 30 46 4a 00 00 04 04 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

```
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 2            Rev 07   740-029970   QCS1121U076       PS 1.4-2.52kW; 90-264V
AC in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-029970        S/N:               QCS1121U076
 Assembly ID:  0x0432            Assembly Version:  01.07
 Date:         05-23-2011        Assembly Flags:    0x00
 Version:      Rev 07
 ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number:  PWR-MX480-2520-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 32 01 07 52 65 76 20 30 37 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
  Address 0x20: 51 43 53 31 31 32 31 55 30 37 36 00 00 17 05 07
  Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 05   740-031116   9009092471        RE-S-1800x4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-031116        S/N:               9009092471
 Assembly ID:  0x09c0            Assembly Version:  01.05
 Date:         11-01-2011        Assembly Flags:    0x00
 Version:      REV 05            CLEI Code:         COUCALDBAA
 ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
  Address 0x00: 54 32 30 32 37 43 41 2d 34 32 46 42 23 23 23 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
  Address 0x20: 39 30 30 39 30 39 32 34 37 31 00 00 00 01 0b 07
  Address 0x30: db ff ff ff 54 32 30 32 37 43 41 2d 34 32 46 42
  Address 0x40: 23 23 23 00 01 43 4f 55 43 41 4c 44 42 41 41 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4b ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3896 MB  VRFCF14096DIHK1      VM4096MB 6862     Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-478612-001127 Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 05   740-031116   9009097958        RE-S-1800x4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-031116        S/N:               9009097958
 Assembly ID:  0x09c0            Assembly Version:  01.05
 Date:         02-06-2012        Assembly Flags:    0x00
 Version:      REV 05            CLEI Code:         COUCALDBAA
 ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
  Address 0x00: 54 32 30 32 37 43 41 2d 34 32 46 42 23 23 23 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
```



```
  Address 0x20: 39 30 30 39 30 39 37 39 35 38 00 00 00 06 02 07
  Address 0x30: dc ff ff ff 54 32 30 32 37 43 41 2d 34 32 46 42
  Address 0x40: 23 23 23 00 01 43 4f 55 43 41 4c 44 42 41 41 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4b ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3896 MB  VRFCF14096DIHK1      VM4096MB 6145     Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000273 Disk 1

...
```

show chassis hardware (MX960 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                  MX960
Midplane         REV 01   710-013698   AA6082            MX960 Midplane
PIM              Rev 01   740-013110   000008            Power Inlet Module
PEM 2
PEM 3            Rev 01   740-013682   000038            PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 00   740-015113   1000617944        RE-S-1300
CB 0             REV 05   710-013725   JK6947            MX960 Test SCB
FPC 4            REV 01   710-013305   JM7617            MX960 Test DPC
  CPU
  PIC 0                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN)
  PIC 1                   BUILTIN      BUILTIN           10x 1GE
FPC 7            REV 01   710-013305   JL9634            MX960 Test DPC
  CPU
  PIC 0                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN)
    Xcvr 0                NON-JNPR     MYBG65I82C        XFP-10G-SR
  PIC 1                   BUILTIN      BUILTIN           10x 1GE
    Xcvr 1       REV 01   740-011782   P7N0368           SFP-SX
    Xcvr 4       REV 01   740-011782   P8J1W27           SFP-SX
    Xcvr 6       REV 01   740-011782   P8J1VSD           SFP-SX
    Xcvr 9       REV 01   740-011782   P8J1W25           SFP-SX
Fan Tray 0
Fan Tray 1
```

show chassis hardware (MX960 Router with Bidirectional Optics)

```
user@host> 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   PDSOMPZ           SFP-SR
FPC 10            REV 04   710-013699   JY4654            DPCE 40x 1GE R
  CPU             REV 05   710-013713   JS9717            DPC PMB
  PIC 0                    BUILTIN      BUILTIN           10x 1GE(LAN)
    Xcvr 5        REV 01   740-011782   PAR1L72           SFP-SX
    Xcvr 6        REV 01   740-011782   P8N1YQ4           SFP-SX
  PIC 1                    BUILTIN      BUILTIN           10x 1GE(LAN)
  PIC 2                    BUILTIN      BUILTIN           10x 1GE(LAN)
    Xcvr 0        REV 01   740-011782   P8Q2AVL           SFP-SX
    Xcvr 5        REV 01   740-011782   PAR1L7B           SFP-SX
    Xcvr 6        REV 01   740-011782   PAR1L2J           SFP-SX
    Xcvr 8        REV 01   740-011782   P8N1YMY           SFP-SX
  PIC 3                    BUILTIN      BUILTIN           10x 1GE(LAN)
Fan Tray 0        REV 03   740-014971   TP0567            Fan Tray
Fan Tray 1        REV 03   740-014971   TP0702            Fan Tray
```

show chassis hardware models (MX960 Router with Enhanced MX SCB)

```
user@host> show chassis hardware models
Hardware inventory:
Item              Version  Part number  Serial number     FRU model number
Midplane          REV 03   710-013698   TR0183            CHAS-BP-MX960-S
Fan Extender      REV 02   710-018051   JY5227            ECM-MX960
FPM Board         REV 03   710-014974   JZ6876            CRAFT-MX960-S
Routing Engine 0 REV 06    740-013063   1000687969        RE-S-2000-4096-S
Routing Engine 1 REV 06    740-013063   1000687955        RE-S-2000-4096-S
CB 0              REV 11   750-031391   YZ6072            SCBE-MX-S
CB 1              REV 11   750-031391   YZ6068            SCBE-MX-S
CB 2              REV 11   750-031391   YZ6081            SCBE-MX-S
FPC 0             REV 01   750-018122   KA5576            DPCE-R-40GE-SFP
FPC 1             REV 16   750-031089   YL0719            MX-MPC2-3D
  MIC 0           REV 07   750-028387   JR6500            MIC-3D-4XGE-XFP
  MIC 1           REV 24   750-028387   YJ3950            MIC-3D-4XGE-XFP
FPC 2             REV 08   710-014219   JY9654            DPC-R-4XGE-XFP
FPC 3             REV 10   750-024199   XJ6692            MX-FPC3
  PIC 0           REV 17   750-009553   RJ2945            PC-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 (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN1214852AFA      MX960
Midplane          REV 01   710-030012   ACAX3674          MX960 Backplane
FPM Board         REV 03   710-014974   CAAZ9326          Front Panel Display
PDM              Rev 03   740-013110   QCS17025017       Power Distribution Module
PEM 0             Rev 10   740-027760   QCS1702N062       PS 4.1kW; 200-240V AC
in
PEM 1             Rev 04   740-027760   QCS1422N02C       PS 4.1kW; 200-240V AC
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in
PEM 2            Rev 09   740-027760   QCS1614N01X       PS 4.1kW; 200-240V AC
in
Routing Engine 0 REV 08   740-031116   9009131803        RE-S-1800x4
Routing Engine 1 REV 08   740-031116   9009124913        RE-S-1800x4
CB 0             REV 18   750-031391   CABF0579          Enhanced MX SCB
CB 1             REV 16   750-031391   CAAZ2471          Enhanced MX SCB
CB 2             REV 16   750-031391   CAAW9595          Enhanced MX SCB
FPC 0            REV 18   750-046005   CACE6574          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8908          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQA0DYT           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MS7           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-046563   XD16FC03Z         CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   ANA0NAJ           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MRQ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-049775   J13K72993         CFP2-100G-LR4
FPC 1            REV 11   750-045372   CABK8154          MPCE Type 3 3D
  CPU            REV 08   711-035209   CABE7370          HMPC PMB 2G
  MIC 0          REV 07   750-033307   CABD5255          10X10GE SFPP
    PIC 0                 BUILTIN      BUILTIN           10X10GE SFPP
      Xcvr 0     REV 01   740-021308   AQ50319           SFP+-10G-SR
      Xcvr 1     REV 01   740-021308   AQ5035V           SFP+-10G-SR
      Xcvr 2     REV 01   740-021308   AQ502XJ           SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQ43HHR           SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   AQ502YA           SFP+-10G-SR
      Xcvr 5     REV 01   740-021308   AQ502EU           SFP+-10G-SR
      Xcvr 6     REV 01   740-021308   AQ502HR           SFP+-10G-SR
      Xcvr 7     REV 01   740-021308   AQ502A6           SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AQ43H8M           SFP+-10G-SR
  MIC 1          REV 14   750-033196   CAAP1398          1X100GE CXP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CXP
      Xcvr 0     REV 01   740-046563   XD16FC064         CFP-100G-SR10
FPC 3            REV 35   750-028467   CAAT9156          MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAV4645          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43HZ1           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ43HZC           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ43HD2           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502HN           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43HGF           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ501RZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ5029V           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ501X9           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ502ZN           SFP+-10G-SR
 Xcvr 1       REV 01   740-021308   AQ43H86           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ502ZY           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502PZ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ503E6           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ502XN           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11F00213         SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ50336           SFP+-10G-SR
FPC 4            REV 18   750-046005   CACE6568          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8900          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
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    Xcvr 0       REV 01   740-021308   AQA095A          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0M1E          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     FE13F000F        CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0LYC          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LYB          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-048813   XD32FE00Z        CFP2-100G-SR10
FPC 5            REV 18   750-046005   CACE6577         MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8902         RMPC PMB
  PIC 0                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0MXE          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LVY          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-046563   XD16FC03T        CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0LW1          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LW3          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     FE13F000J        CFP2-100G-SR10
FPC 7            REV 09   750-037355   CAAF0937         MPC4E 3D 2CGE+8XGE
  CPU            REV 08   711-035209   CAAD8004         HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN          4x10GE SFPP
    Xcvr 0       REV 01   740-021308   ANA0MM3          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          1X100GE CFP
    Xcvr 0       REV 01   740-035329   X000C163         CFP-100G-SR10
  PIC 2                   BUILTIN      BUILTIN          4x10GE SFPP
    Xcvr 0       REV 01   740-021308   AQG0MS6          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MRX          SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQG0M6Y          SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQG0LZM          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          1X100GE CFP
    Xcvr 0       REV 01   740-035329   X12J00499        CFP-100G-SR10
FPC 8            REV 39   750-045715   CACD1903         MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 09   711-045719   CACD1815         RMPC PMB
  PIC 0                   BUILTIN      BUILTIN          12X10GE SFPP OTN
  PIC 1                   BUILTIN      BUILTIN          12X10GE SFPP OTN
  PIC 2                   BUILTIN      BUILTIN          3X40GE QSFPP
    Xcvr 0       REV 01   740-046565   QC480289         QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QC480274         QSFP+-40G-SR4
    Xcvr 2       REV 01   740-046565   QD130190         QSFP+-40G-SR4
  PIC 3                   BUILTIN      BUILTIN          3X40GE QSFPP
    Xcvr 0       REV 01   740-046565   QD130197         QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QD130180         QSFP+-40G-SR4
 Xcvr 2       REV 01   740-046565   QD130199         QSFP+-40G-SR4
  WAN MEZZ       REV 09   750-049136   CABN0415         MPC5E 24XGE OTN Mezz
FPC 9            REV 05   750-044444   CAAY9801         MPCE Type 2 3D P
  CPU            REV 04   711-038484   CAAW3673         MPCE PMB 2G
  MIC 0          REV 28   750-028387   CAAX1071         3D 4x 10GE  XFP
    PIC 0                 BUILTIN      BUILTIN          2x 10GE  XFP
      Xcvr 0              NON-JNPR     T12L92342        XFP-10G-SR
      Xcvr 1              NON-JNPR     T12L92303        XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN          2x 10GE  XFP
      Xcvr 0              NON-JNPR     CC07BK02X        XFP-10G-SR
  QXM 0          REV 06   711-028408   CAAW4883         MPC QXM
  QXM 1          REV 06   711-028408   CAAW4603         MPC QXM
FPC 10           REV 21.0.11 750-045715 CAAY3541        MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 07   711-045719   CAAW7426         RMPC PMB
  PIC 0                   BUILTIN      BUILTIN          12X10GE SFPP
    Xcvr 0       REV 01   740-031980   AHK01AP          SFP+-10G-SR
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    Xcvr 1        REV 01   740-021308   AQ502ZU           SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AP41BLS           SFP+-10G-SR
    Xcvr 3        REV 01   740-021308   AQA08YA           SFP+-10G-SR
    Xcvr 4        REV 01   740-021308   AQA0K26           SFP+-10G-SR
    Xcvr 6        REV 01   740-021308   AQA06S3           SFP+-10G-SR
    Xcvr 7        REV 01   740-021308   AQA06AS           SFP+-10G-SR
    Xcvr 8        REV 01   740-021308   AQA053N           SFP+-10G-SR
    Xcvr 9        REV 01   740-021308   AQA0E97           SFP+-10G-SR
    Xcvr 10       REV 01   740-021308   AQA0GS4           SFP+-10G-SR
    Xcvr 11       REV 01   740-021308   AQA0JVA           SFP+-10G-SR
  PIC 1                    BUILTIN      BUILTIN           12X10GE SFPP
    Xcvr 0        REV 01   740-021308   AQA057A           SFP+-10G-SR
    Xcvr 1        REV 01   740-021308   ANA0MLS           SFP+-10G-SR
    Xcvr 2        REV 01   740-021308   AQA093A           SFP+-10G-SR
    Xcvr 3        REV 01   740-021309   943153A00075      SFP+-10G-LR
    Xcvr 4        REV 01   740-021308   AQA077B           SFP+-10G-SR
    Xcvr 5        REV 01   740-021308   AQA0JSC           SFP+-10G-SR
    Xcvr 6        REV 01   740-021308   AQA0735           SFP+-10G-SR
    Xcvr 7        REV 01   740-021308   AQ5028N           SFP+-10G-SR
    Xcvr 8        REV 01   740-031980   AP40VN5           SFP+-10G-SR
    Xcvr 9        REV 01   740-021308   AQA0K0J           SFP+-10G-SR
    Xcvr 10       REV 01   740-021308   AQA07AP           SFP+-10G-SR
    Xcvr 11       REV 01   740-021308   AQA08YB           SFP+-10G-SR
  PIC 2                    BUILTIN      BUILTIN           3X40GE QSFPP
  PIC 3                    BUILTIN      BUILTIN           3X40GE QSFPP
  WAN MEZZ        REV 07   750-045717   CAAX3123          MPC5E 24XGE Mezz
FPC 11            REV 17   750-037355   CAAT3986          MPC4E 3D 2CGE+8XGE
  CPU             REV 08   711-035209   CAAR3972          HMPC PMB 2G
  PIC 0                    BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0        REV 01   740-021308   AQA0DSE           SFP+-10G-SR
    Xcvr 1        REV 01   740-021308   AQ501Y3           SFP+-10G-SR
    Xcvr 2        REV 01   740-021308   AQ501XU           SFP+-10G-SR
    Xcvr 3        REV 01   740-021308   AQ5036Y           SFP+-10G-SR
  PIC 1                    BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0                 NON-JNPR     X12J00247         CFP-100G-SR10
  PIC 2                    BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0        REV 01   740-031980   ALQ1DKF           SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   AJ403YA           SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AP40TY0           SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   ALQ14G0           SFP+-10G-SR
  PIC 3                    BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0        REV 01   740-035329   X12J00095         CFP-100G-SR10
Fan Tray 0        REV 08   740-031521   ACAF4219          Enhanced Fan Tray
Fan Tray 1        REV 08   740-031521   ACAF4225          Enhanced Fan Tray
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show chassis hardware detail (MX960 Router)

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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
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  PIC 0                  BUILTIN      BUILTIN          1x 10GE(LAN/WAN)
  PIC 1                  BUILTIN      BUILTIN          10x 1GE
FPC 7           REV 01   710-013305   JL9634           MX960 Test DPC
  CPU
  PIC 0                  BUILTIN      BUILTIN          1x 10GE(LAN/WAN)
    Xcvr 0               NON-JNPR     MYBG65I82C       XFP-10G-SR
  PIC 1                  BUILTIN      BUILTIN          10x 1GE
    Xcvr 1      REV 01   740-011782   P7N0368          SFP-SX
    Xcvr 4      REV 01   740-011782   P8J1W27          SFP-SX
    Xcvr 6      REV 01   740-011782   P8J1VSD          SFP-SX
    Xcvr 9      REV 01   740-011782   P8J1W25          SFP-SX
Fan Tray 0
Fan Tray 1
```

show chassis hardware detail (MX960 Router with MPC5EQ)

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user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1214852AFA      MX960
Midplane         REV 01   710-030012   ACAX3674          MX960 Backplane
FPM Board        REV 03   710-014974   CAAZ9326          Front Panel Display
PDM             Rev 03   740-013110   QCS17025017       Power Distribution Module
PEM 0            Rev 10   740-027760   QCS1702N062       PS 4.1kW; 200-240V AC
in
PEM 1            Rev 04   740-027760   QCS1422N02C       PS 4.1kW; 200-240V AC
in
PEM 2            Rev 09   740-027760   QCS1614N01X       PS 4.1kW; 200-240V AC
in
Routing Engine 0 REV 08   740-031116   9009131803        RE-S-1800x4
  ad0     3831 MB  UGB30SFA4000T1      SFA4000T1 000016CD Compact Flash
  ad1    30533 MB  UGB94BPH32H0S1-KCI  11000061346       Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 1         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 2         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 3         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
Routing Engine 1 REV 08   740-031116   9009124913        RE-S-1800x4
  ad0     3831 MB  UGB30SFA4000T1      SFA4000T1 0000106D Compact Flash
  ad1    30533 MB  UGB94BPH32H0S1-KCI  11000052402       Disk 1
CB 0             REV 18   750-031391   CABF0579          Enhanced MX SCB
CB 1             REV 16   750-031391   CAAZ2471          Enhanced MX SCB
CB 2             REV 16   750-031391   CAAW9595          Enhanced MX SCB
FPC 0            REV 18   750-046005   CACE6574          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8908          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQA0DYT           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MS7           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-046563   XD16FC03Z         CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   ANA0NAJ           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MRQ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-049775   J13K72993         CFP2-100G-LR4
FPC 1            REV 11   750-045372   CABK8154          MPCE Type 3 3D
  CPU            REV 08   711-035209   CABE7370          HMPC PMB 2G
  MIC 0          REV 07   750-033307   CABD5255          10X10GE SFPP
    PIC 0                 BUILTIN      BUILTIN           10X10GE SFPP
      Xcvr 0     REV 01   740-021308   AQ50319           SFP+-10G-SR
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      Xcvr 1     REV 01   740-021308   AQ5035V          SFP+-10G-SR
      Xcvr 2     REV 01   740-021308   AQ502XJ          SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQ43HHR          SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   AQ502YA          SFP+-10G-SR
      Xcvr 5     REV 01   740-021308   AQ502EU          SFP+-10G-SR
      Xcvr 6     REV 01   740-021308   AQ502HR          SFP+-10G-SR
      Xcvr 7     REV 01   740-021308   AQ502A6          SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AQ43H8M          SFP+-10G-SR
  MIC 1          REV 14   750-033196   CAAP1398         1X100GE CXP
    PIC 2                 BUILTIN      BUILTIN          1X100GE CXP
      Xcvr 0     REV 01   740-046563   XD16FC064        CFP2-100G-SR10
FPC 3            REV 35   750-028467   CAAT9156         MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAV4645         AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43HZ1          SFP+-10G-SR
Xcvr 1       REV 01   740-021308   AQ43HZC          SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ43HD2          SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502HN          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43HGF          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ501RZ          SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ5029V          SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ501X9          SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ502ZN          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ43H86          SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ502ZY          SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502PZ          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ503E6          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ502XN          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11F00213        SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ50336          SFP+-10G-SR
FPC 4            REV 18   750-046005   CACE6568         MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8900         RMPC PMB
  PIC 0                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQA095A          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0M1E          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     FE13F000F        CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0LYC          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LYB          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-048813   XD32FE00Z        CFP2-100G-SR10
FPC 5            REV 18   750-046005   CACE6577         MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8902         RMPC PMB
  PIC 0                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0MXE          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LVY          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-046563   XD16FC03T        CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN          2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0LW1          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LW3          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     FE13F000J        CFP2-100G-SR10
FPC 7            REV 09   750-037355   CAAF0937         MPC4E 3D 2CGE+8XGE
  CPU            REV 08   711-035209   CAAD8004         HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN          4x10GE SFPP
    Xcvr 0       REV 01   740-021308   ANA0MM3          SFP+-10G-SR
```

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  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0       REV 01   740-035329   X000C163          CFP-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   AQG0MS6           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MRX           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQG0M6Y           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQG0LZM           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0       REV 01   740-035329   X12J00499         CFP-100G-SR10
FPC 8            REV 39   750-045715   CACD1903          MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 09   711-045719   CACD1815          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           12X10GE SFPP OTN
 PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP OTN
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
    Xcvr 0       REV 01   740-046565   QC480289          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QC480274          QSFP+-40G-SR4
    Xcvr 2       REV 01   740-046565   QD130190          QSFP+-40G-SR4
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
    Xcvr 0       REV 01   740-046565   QD130197          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QD130180          QSFP+-40G-SR4
    Xcvr 2       REV 01   740-046565   QD130199          QSFP+-40G-SR4
  WAN MEZZ       REV 09   750-049136   CABN0415          MPC5E 24XGE OTN Mezz
FPC 9            REV 05   750-044444   CAAY9801          MPCE Type 2 3D P
  CPU            REV 04   711-038484   CAAW3673          MPCE PMB 2G
  MIC 0          REV 28   750-028387   CAAX1071          3D 4x 10GE  XFP
    PIC 0                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0              NON-JNPR     T12L92342         XFP-10G-SR
      Xcvr 1              NON-JNPR     T12L92303         XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0              NON-JNPR     CC07BK02X         XFP-10G-SR
  QXM 0          REV 06   711-028408   CAAW4883          MPC QXM
  QXM 1          REV 06   711-028408   CAAW4603          MPC QXM
FPC 10           REV 21.0.11 750-045715 CAAY3541         MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 07   711-045719   CAAW7426          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           12X10GE SFPP
    Xcvr 0       REV 01   740-031980   AHK01AP           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ502ZU           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AP41BLS           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQA08YA           SFP+-10G-SR
    Xcvr 4       REV 01   740-021308   AQA0K26           SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   AQA06S3           SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   AQA06AS           SFP+-10G-SR
    Xcvr 8       REV 01   740-021308   AQA053N           SFP+-10G-SR
    Xcvr 9       REV 01   740-021308   AQA0E97           SFP+-10G-SR
    Xcvr 10      REV 01   740-021308   AQA0GS4           SFP+-10G-SR
    Xcvr 11      REV 01   740-021308   AQA0JVA           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP
    Xcvr 0       REV 01   740-021308   AQA057A           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   ANA0MLS           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQA093A           SFP+-10G-SR
    Xcvr 3       REV 01   740-021309   943153A00075      SFP+-10G-LR
    Xcvr 4       REV 01   740-021308   AQA077B           SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   AQA0JSC           SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   AQA0735           SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   AQ5028N           SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AP40VN5           SFP+-10G-SR
    Xcvr 9       REV 01   740-021308   AQA0K0J           SFP+-10G-SR
    Xcvr 10      REV 01   740-021308   AQA07AP           SFP+-10G-SR
    Xcvr 11      REV 01   740-021308   AQA08YB           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
```



```
  WAN MEZZ       REV 07    750-045717    CAAX3123          MPC5E 24XGE Mezz
FPC 11           REV 17    750-037355    CAAT3986          MPC4E 3D 2CGE+8XGE
  CPU            REV 08    711-035209    CAAR3972          HMPC PMB 2G
  PIC 0                    BUILTIN       BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01    740-021308    AQA0DSE           SFP+-10G-SR
    Xcvr 1       REV 01    740-021308    AQ501Y3           SFP+-10G-SR
    Xcvr 2       REV 01    740-021308    AQ501XU           SFP+-10G-SR
 Xcvr 3       REV 01    740-021308    AQ5036Y          SFP+-10G-SR
  PIC 1                    BUILTIN       BUILTIN           1X100GE CFP
    Xcvr 0                 NON-JNPR      X12J00247         CFP-100G-SR10
  PIC 2                    BUILTIN       BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01    740-031980    ALQ1DKF           SFP+-10G-SR
    Xcvr 1       REV 01    740-031980    AJ403YA           SFP+-10G-SR
    Xcvr 2       REV 01    740-031980    AP40TY0           SFP+-10G-SR
    Xcvr 3       REV 01    740-031980    ALQ14G0           SFP+-10G-SR
  PIC 3                    BUILTIN       BUILTIN           1X100GE CFP
    Xcvr 0       REV 01    740-035329    X12J00095         CFP-100G-SR10
Fan Tray 0       REV 08    740-031521    ACAF4219          Enhanced Fan Tray
Fan Tray 1       REV 08    740-031521    ACAF4225          Enhanced Fan Tray
```

show chassis hardware extensive (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1214852AFA      MX960
 Jedec Code:    0x7fb0           EEPROM Version:    0x02
                                 S/N:               JN1214852AFA
 Assembly ID:   0x0512           Assembly Version:  00.00
 Date:          00-00-0000       Assembly Flags:    0x00
 ID: MX960
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 12 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 32 31 34 38 35 32 41 46 41 00 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 01   710-030012   ACAX3674          MX960 Backplane
 Jedec Code:    0x7fb0           EEPROM Version:    0x02
 P/N:           710-030012       S/N:               ACAX3674
 Assembly ID:   0x01df           Assembly Version:  01.01
 Date:          01-19-2013       Assembly Flags:    0x00
 Version:       REV 01           CLEI Code:         COM8T00CRB
 ID: MX960 Backplane             FRU Model Number:  CHAS-BP-MX960-S
 Board Information Record:
  Address 0x00: ad 01 08 00 54 e0 32 bc 68 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 01 df 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 33 30 30 31 32 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 58 33 36 37 34 00 13 01 07
  Address 0x30: dd ff ff ff ad 01 08 00 54 e0 32 bc 68 00 ff ff
  Address 0x40: ff ff ff ff 01 43 4f 4d 38 54 30 30 43 52 42 43
  Address 0x50: 48 41 53 2d 42 50 2d 4d 58 39 36 30 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff aa ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 03   710-014974   CAAZ9326          Front Panel Display
```

```
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          710-014974       S/N:               CAAZ9326
 Assembly ID:  0x01e6           Assembly Version:  01.03
 Date:         12-31-2012       Assembly Flags:    0x00
 Version:      REV 03
 ID: Front Panel Display        FRU Model Number:  CRAFT-MX960-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 01 e6 01 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 31 34 39 37 34 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 5a 39 33 32 36 00 1f 0c 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
  Address 0x50: 52 41 46 54 2d 4d 58 39 36 30 2d 53 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PDM              Rev 03   740-013110   QCS17025017       Power Distribution Module
Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          740-013110       S/N:               QCS17025017
 Assembly ID:  0x0416           Assembly Version:  01.03
 Date:         01-10-2013       Assembly Flags:    0x00
 Version:      Rev 03
 ID: Power Distribution Module
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 16 01 03 52 65 76 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 31 33 31 31 30 00 00
  Address 0x20: 51 43 53 31 37 30 32 35 30 31 37 00 00 0a 01 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 0             Rev 10   740-027760   QCS1702N062       PS 4.1kW; 200-240V AC
in
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          740-027760       S/N:               QCS1702N062
 Assembly ID:  0x0430           Assembly Version:  01.10
 Date:         01-15-2013       Assembly Flags:    0x00
 Version:      Rev 10
 ID: PS 4.1kW; 200-240V AC in    FRU Model Number:  PWR-MX960-4100-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 30 01 0a 52 65 76 20 31 30 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
  Address 0x20: 51 43 53 31 37 30 32 4e 30 36 32 00 00 0f 01 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 1             Rev 04   740-027760   QCS1422N02C       PS 4.1kW; 200-240V AC
in
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          740-027760       S/N:               QCS1422N02C
 Assembly ID:  0x0430           Assembly Version:  01.04
 Date:         06-04-2010       Assembly Flags:    0x00
 Version:      Rev 04
```



```
 ID: PS 4.1kW; 200-240V AC in    FRU Model Number:  PWR-MX960-4100-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 30 01 04 52 65 76 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
  Address 0x20: 51 43 53 31 34 32 32 4e 30 32 43 00 00 04 06 07
  Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 2            Rev 09   740-027760   QCS1614N01X       PS 4.1kW; 200-240V AC
in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-027760        S/N:               QCS1614N01X
Assembly ID:  0x0430            Assembly Version:  01.09
 Date:         04-07-2012        Assembly Flags:    0x00
 Version:      Rev 09
 ID: PS 4.1kW; 200-240V AC in    FRU Model Number:  PWR-MX960-4100-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 30 01 09 52 65 76 20 30 39 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
  Address 0x20: 51 43 53 31 36 31 34 4e 30 31 58 00 00 07 04 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 08   740-031116   9009131803        RE-S-1800x4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-031116        S/N:               9009131803
 Assembly ID:  0x09c0            Assembly Version:  01.08
 Date:         03-04-2013        Assembly Flags:    0x00
 Version:      REV 08            CLEI Code:         COUCASKBAA
 ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
  Address 0x00: 54 32 30 32 37 44 42 2d 34 34 47 42 23 42 23 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
  Address 0x20: 39 30 30 39 31 33 31 38 30 33 00 00 00 04 03 07
  Address 0x30: dd ff ff ff 54 32 30 32 37 44 42 2d 34 34 47 42
  Address 0x40: 23 42 23 00 01 43 4f 55 43 41 53 4b 42 41 41 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 59 ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3831 MB  UGB30SFA4000T1       SFA4000T1 000016CD Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000061346       Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 1         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 2         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 3         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
Routing Engine 1 REV 08   740-031116   9009124913        RE-S-1800x4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-031116        S/N:               9009124913
 Assembly ID:  0x09c0            Assembly Version:  01.08
```

```
 Date:         01-09-2013        Assembly Flags:    0x00
 Version:      REV 08            CLEI Code:         COUCASKBAA
 ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
  Address 0x00: 54 32 30 32 37 44 42 2d 34 34 47 42 23 42 23 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
  Address 0x20: 39 30 30 39 31 32 34 39 31 33 00 00 00 09 01 07
  Address 0x30: dd ff ff ff 54 32 30 32 37 44 42 2d 34 34 47 42
  Address 0x40: 23 42 23 00 01 43 4f 55 43 41 53 4b 42 41 41 52
 Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 59 ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3831 MB  UGB30SFA4000T1       SFA4000T1 0000106D Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000052402       Disk 1
CB 0             REV 18   750-031391   CABF0579          Enhanced MX SCB
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-031391        S/N:               CABF0579
 Assembly ID:  0x09b0            Assembly Version:  01.18
 Date:         04-15-2013        Assembly Flags:    0x00
 Version:      REV 18            CLEI Code:         COUCASRBAA
 ID: Enhanced MX SCB             FRU Model Number:  SCBE-MX-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 b0 01 12 52 45 56 20 31 38 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
  Address 0x20: 53 2f 4e 20 43 41 42 46 30 35 37 39 00 0f 04 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4f 55 43 41 53 52 42 41 41 53
  Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 43 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 7d ff ff ff ff ff ff ff ff ff ff ff ff
CB 1             REV 16   750-031391   CAAZ2471          Enhanced MX SCB
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-031391        S/N:               CAAZ2471
 Assembly ID:  0x09b0            Assembly Version:  01.16
 Date:         03-09-2013        Assembly Flags:    0x00
 Version:      REV 16            CLEI Code:         COUCARCBAB
 ID: Enhanced MX SCB             FRU Model Number:  SCBE-MX-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 b0 01 10 52 45 56 20 31 36 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 5a 32 34 37 31 00 09 03 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4f 55 43 41 52 43 42 41 42 53
  Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 6d ff ff ff ff ff ff ff ff ff ff ff ff
CB 2             REV 16   750-031391   CAAW9595          Enhanced MX SCB
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-031391        S/N:               CAAW9595
 Assembly ID:  0x09b0            Assembly Version:  01.16
 Date:         02-01-2013        Assembly Flags:    0x00
 Version:      REV 16            CLEI Code:         COUCARCBAB
 ID: Enhanced MX SCB             FRU Model Number:  SCBE-MX-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```



```
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 09 b0 01 10 52 45 56 20 31 36 00 00
   Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
   Address 0x20: 53 2f 4e 20 43 41 41 57 39 35 39 35 00 01 02 07
   Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 43 4f 55 43 41 52 43 42 41 42 53
  Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 6d ff ff ff ff ff ff ff ff ff ff ff ff
FPC 0            REV 18   750-046005   CACE6574          MPC5E 3D Q 2CGE+4XGE
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          750-046005        S/N:               CACE6574
  Assembly ID:  0x0b8c            Assembly Version:  01.18
  Date:         11-20-2013        Assembly Flags:    0x00
  Version:      REV 18            CLEI Code:         PROTOXCLEI
  ID: MPC5E 3D Q 2CGE+4XGE        FRU Model Number:  PROTO-ASSEMBLY
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 0b 8c 01 12 52 45 56 20 31 38 00 00
   Address 0x10: 00 00 00 00 37 35 30 2d 30 34 36 30 30 35 00 00
   Address 0x20: 53 2f 4e 20 43 41 43 45 36 35 37 34 00 14 0b 07
   Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
   Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
   Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
   CPU           REV 09   711-045719   CACG8908          RMPC PMB
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          711-045719        S/N:               CACG8908
  Assembly ID:  0x0b85            Assembly Version:  01.09
  Date:         11-13-2013        Assembly Flags:    0x00
  Version:      REV 09
  ID: RMPC PMB
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 0b 85 01 09 52 45 56 20 30 39 00 00
   Address 0x10: 00 00 00 00 37 31 31 2d 30 34 35 37 31 39 00 00
   Address 0x20: 53 2f 4e 20 43 41 43 47 38 39 30 38 00 0d 0b 07
   Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 50
   Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
   Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff c2 00 00 00 00 00 00 00 00 00 00 00 00
   PIC 0                  BUILTIN      BUILTIN           2X10GE SFPP OTN
  Jedec Code:   0x0000            EEPROM Version:    0x00
  P/N:          BUILTIN           S/N:               BUILTIN
  Assembly ID:  0x0a90            Assembly Version:  00.00
  Date:         00-00-0000        Assembly Flags:    0x00
  ID: 2X10GE SFPP OTN
  Board Information Record:
   Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  I2C Hex Data:
   Address 0x00: 00 00 00 00 0a 90 00 00 00 00 00 00 00 00 00 00
   Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
   Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
   Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
  Address 0x70: 00 00 00 00 c0 02 ae dc 00 00 00 00 0a 6e 00 00
 Xcvr 0       REV 01   740-021308   AQA0DYT          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MS7          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
 Jedec Code:   0x0000            EEPROM Version:    0x00
 P/N:          BUILTIN           S/N:               BUILTIN
 Assembly ID:  0x0a6e            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: 1X100GE CFP2 OTN
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 0a 6e 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 c0 03 f3 8c 31 5c e7 80 00 00 00 02
    Xcvr 0       REV 01   740-046563   XD16FC03Z        CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN          2X10GE SFPP OTN
 Jedec Code:   0x0000            EEPROM Version:    0x00
 P/N:          BUILTIN           S/N:               BUILTIN
 Assembly ID:  0x0a90            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: 2X10GE SFPP OTN
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 0a 90 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 c0 03 f5 6c 31 5c db 40 00 00 00 02
    Xcvr 0       REV 01   740-021308   ANA0NAJ          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MRQ          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          1X100GE CFP2 OTN
 Jedec Code:   0x0000            EEPROM Version:    0x00
 P/N:          BUILTIN           S/N:               BUILTIN
 Assembly ID:  0x0a6e            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: 1X100GE CFP2 OTN
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 0a 6e 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 c0 03 ed ec 31 5c e2 e8 00 00 00 02
 Xcvr 0       REV 01   740-049775   J13K72993        CFP2-100G-LR4
FPC 1            REV 11   750-045372   CABK8154         MPCE Type 3 3D
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-045372        S/N:               CABK8154
```



```
 Assembly ID:  0x09db           Assembly Version:  04.11
 Date:         05-18-2013       Assembly Flags:    0x00
 Version:      REV 11           CLEI Code:         COUIBBNBAA
 ID: MPCE Type 3 3D             FRU Model Number:  MX-MPC3E-3D
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 db 04 0b 52 45 56 20 31 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 35 33 37 32 00 00
  Address 0x20: 53 2f 4e 20 43 41 42 4b 38 31 35 34 00 12 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4e 42 41 41 4d
  Address 0x50: 58 2d 4d 50 43 33 45 2d 33 44 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 44 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff cf ff ff ff ff ff ff ff ff ff ff ff ff
  CPU            REV 08   711-035209   CABE7370          HMPC PMB 2G
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          711-035209       S/N:               CABE7370
 Assembly ID:  0x0b04           Assembly Version:  01.08
 Date:         05-08-2013       Assembly Flags:    0x00
 Version:      REV 08
 ID: HMPC PMB 2G
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b 04 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 35 32 30 39 00 00
  Address 0x20: 53 2f 4e 20 43 41 42 45 37 33 37 30 00 08 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
  MIC 0          REV 07   750-033307   CABD5255          10X10GE SFPP
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          750-033307       S/N:               CABD5255
 Assembly ID:  0x0a2a           Assembly Version:  02.07
 Date:         04-25-2013       Assembly Flags:    0x00
 Version:      REV 07           CLEI Code:         COUIBBJBAA
 ID: 10X10GE SFPP               FRU Model Number:  MIC3-3D-10XGE-SFPP
 Board Information Record:
  Address 0x00: 34 01 03 03 05 ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0a 2a 02 07 52 45 56 20 30 37 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 33 33 30 37 00 00
  Address 0x20: 53 2f 4e 20 43 41 42 44 35 32 35 35 00 19 04 07
  Address 0x30: dd ff ff ff 34 01 03 03 05 ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4a 42 41 41 4d
  Address 0x50: 49 43 33 2d 33 44 2d 31 30 58 47 45 2d 53 46 50
  Address 0x60: 50 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 82 c0 03 f0 bc 57 79 83 80 00 00 00 02
    PIC 0                 BUILTIN      BUILTIN           10X10GE SFPP
Xcvr 0     REV 01   740-021308   AQ50319           SFP+-10G-SR
      Xcvr 1     REV 01   740-021308   AQ5035V           SFP+-10G-SR
      Xcvr 2     REV 01   740-021308   AQ502XJ           SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQ43HHR           SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   AQ502YA           SFP+-10G-SR
      Xcvr 5     REV 01   740-021308   AQ502EU           SFP+-10G-SR
      Xcvr 6     REV 01   740-021308   AQ502HR           SFP+-10G-SR
      Xcvr 7     REV 01   740-021308   AQ502A6           SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AQ43H8M           SFP+-10G-SR
```

```
 MIC 1          REV 14   750-033196   CAAP1398          1X100GE CXP
Jedec Code:   0x7fb0           EEPROM Version:    0x02
P/N:          750-033196       S/N:               CAAP1398
Assembly ID:  0x0a29           Assembly Version:  03.14
Date:         10-27-2012       Assembly Flags:    0x00
Version:      REV 14           CLEI Code:         COUIBBKBAA
ID: 1X100GE CXP                FRU Model Number:  MIC3-3D-1X100GE-CXP
Board Information Record:
 Address 0x00: 34 01 07 07 08 ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 fe 0a 29 03 0e 52 45 56 20 31 34 00 00
 Address 0x10: 00 00 00 00 37 35 30 2d 30 33 33 31 39 36 00 00
 Address 0x20: 53 2f 4e 20 43 41 41 50 31 33 39 38 00 1b 0a 07
 Address 0x30: dc ff ff ff 34 01 07 07 08 ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4b 42 41 41 4d
 Address 0x50: 49 43 33 2d 33 44 2d 31 58 31 30 30 47 45 2d 43
 Address 0x60: 58 50 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 96 c0 03 ef cc 57 79 85 08 00 00 00 02
   PIC 2                 BUILTIN      BUILTIN           1X100GE CXP
     Xcvr 0     REV 01   740-046563   XD16FC064         CFP2-100G-SR10
FPC 3           REV 35   750-028467   CAAT9156          MPC 3D 16x 10GE
Jedec Code:   0x7fb0           EEPROM Version:    0x01
P/N:          750-028467       S/N:               CAAT9156
Assembly ID:  0x0997           Assembly Version:  01.35
Date:         12-17-2012       Assembly Flags:    0x00
Version:      REV 35
ID: MPC 3D 16x 10GE            FRU Model Number:  MPC-3D-16XGE-SFPP
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 09 97 01 23 52 45 56 20 33 35 00 00
 Address 0x10: 00 00 00 00 37 35 30 2d 30 32 38 34 36 37 00 00
 Address 0x20: 53 2f 4e 20 43 41 41 54 39 31 35 36 00 11 0c 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 4d
 Address 0x50: 50 43 2d 33 44 2d 31 36 58 47 45 2d 53 46 50 50
 Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
 Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 CPU            REV 11   711-029089   CAAV4645          AMPC PMB
Jedec Code:   0x7fb0           EEPROM Version:    0x01
P/N:          711-029089       S/N:               CAAV4645
Assembly ID:  0x0998           Assembly Version:  01.11
Date:         12-13-2012       Assembly Flags:    0x00
Version:      REV 11
ID: AMPC PMB
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 09 98 01 0b 52 45 56 20 31 31 00 00
 Address 0x10: 00 00 00 00 37 31 31 2d 30 32 39 30 38 39 00 00
 Address 0x20: 53 2f 4e 20 43 41 41 56 34 36 34 35 00 0d 0c 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
 Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
 PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
Jedec Code:   0x0000           EEPROM Version:    0x00
P/N:          BUILTIN          S/N:               BUILTIN
Assembly ID:  0x02fe           Assembly Version:  00.00
Date:         00-00-0000       Assembly Flags:    0x00
```



```
 ID: 4x 10GE(LAN) SFP+
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 02 fe 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 c0 02 6b 94 00 00 00 00 02 fe 00 00
    Xcvr 0       REV 01   740-021308   AQ43HZ1           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ43HZC           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ43HD2           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502HN           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
 Jedec Code:   0x0000            EEPROM Version:    0x00
 P/N:          BUILTIN           S/N:               BUILTIN
 Assembly ID:  0x02fe            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: 4x 10GE(LAN) SFP+
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 02 fe 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 c0 02 ac 0c 00 00 00 00 02 fe 00 00
    Xcvr 0       REV 01   740-021308   AQ43HGF           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ501RZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ5029V           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ501X9           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
 Jedec Code:   0x0000            EEPROM Version:    0x00
 P/N:          BUILTIN           S/N:               BUILTIN
 Assembly ID:  0x02fe            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
......
```

show chassis hardware models (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 01   710-030012   ACAX3674          CHAS-BP-MX960-S
FPM Board        REV 03   710-014974   CAAZ9326          CRAFT-MX960-S
PEM 0            Rev 10   740-027760   QCS1702N062       PWR-MX960-4100-AC-S
PEM 1            Rev 04   740-027760   QCS1422N02C       PWR-MX960-4100-AC-S
PEM 2            Rev 09   740-027760   QCS1614N01X       PWR-MX960-4100-AC-S
Routing Engine 0 REV 08   740-031116   9009131803        RE-S-1800X4-16G-S
Routing Engine 1 REV 08   740-031116   9009124913        RE-S-1800X4-16G-S
CB 0             REV 18   750-031391   CABF0579          SCBE-MX-S
CB 1             REV 16   750-031391   CAAZ2471          SCBE-MX-S
CB 2             REV 16   750-031391   CAAW9595          SCBE-MX-S
FPC 0            REV 18   750-046005   CACE6574          PROTO-ASSEMBLY
FPC 1            REV 11   750-045372   CABK8154          MX-MPC3E-3D
```

```
  MIC 0            REV 07    750-033307    CABD5255           MIC3-3D-10XGE-SFPP
  MIC 1            REV 14    750-033196    CAAP1398           MIC3-3D-1X100GE-CXP
FPC 3              REV 35    750-028467    CAAT9156           MPC-3D-16XGE-SFPP
FPC 4              REV 18    750-046005    CACE6568           PROTO-ASSEMBLY
FPC 5              REV 18    750-046005    CACE6577           PROTO-ASSEMBLY
FPC 7              REV 09    750-037355    CAAF0937           MPC4E-2CGE-8XGE
FPC 8              REV 39    750-045715    CACD1903           PROTO-ASSEMBLY
FPC 9              REV 05    750-044444    CAAY9801           MX-MPC2E-3D-P
  MIC 0            REV 28    750-028387    CAAX1071           MIC-3D-4XGE-XFP
FPC 10             REV 21.0.11 750-045715 CAAY3541            PROTO-ASSEMBLY
FPC 11             REV 17    750-037355    CAAT3986           MPC4E-3D-2CGE-8XGE
Fan Tray 0         REV 08    740-031521    ACAF4219           FFANTRAY-MX960-HC-S
Fan Tray 1         REV 08    740-031521    ACAF4225           FFANTRAY-MX960-HC-S
```

show chassis hardware clei-models (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item               Version   Part number   CLEI code          FRU model number
Midplane           REV 01    710-030012    COM8T00CRB         CHAS-BP-MX960-S
FPM Board          REV 03    710-014974                       CRAFT-MX960-S
PEM 0              Rev 10    740-027760                       PWR-MX960-4100-AC-S
PEM 1              Rev 04    740-027760                       PWR-MX960-4100-AC-S
PEM 2              Rev 09    740-027760                       PWR-MX960-4100-AC-S
Routing Engine 0 REV 08      740-031116    COUCASKBAA         RE-S-1800X4-16G-S
Routing Engine 1 REV 08      740-031116    COUCASKBAA         RE-S-1800X4-16G-S
CB 0               REV 18    750-031391    COUCASRBAA         SCBE-MX-S
CB 1               REV 16    750-031391    COUCARCBAB         SCBE-MX-S
CB 2               REV 16    750-031391    COUCARCBAB         SCBE-MX-S
FPC 0              REV 18    750-046005    PROTOXCLEI         PROTO-ASSEMBLY
FPC 1              REV 11    750-045372    COUIBBNBAA         MX-MPC3E-3D
  MIC 0            REV 07    750-033307    COUIBBJBAA         MIC3-3D-10XGE-SFPP
  MIC 1            REV 14    750-033196    COUIBBKBAA         MIC3-3D-1X100GE-CXP
FPC 3              REV 35    750-028467                       MPC-3D-16XGE-SFPP
FPC 4              REV 18    750-046005    PROTOXCLEI         PROTO-ASSEMBLY
FPC 5              REV 18    750-046005    PROTOXCLEI         PROTO-ASSEMBLY
FPC 7              REV 09    750-037355    PROTOXCLEI         MPC4E-2CGE-8XGE
FPC 8              REV 39    750-045715    PROTOXCLEI         PROTO-ASSEMBLY
FPC 9              REV 05    750-044444    COUIBBGBAA         MX-MPC2E-3D-P
  MIC 0            REV 28    750-028387    COUIA16BAA         MIC-3D-4XGE-XFP
FPC 10             REV 21.0.11 750-045715  PROTOXCLEI         PROTO-ASSEMBLY
FPC 11             REV 17    750-037355    IPU3A4DHAA         MPC4E-3D-2CGE-8XGE
Fan Tray 0         REV 08    740-031521                       FFANTRAY-MX960-HC-S
Fan Tray 1         REV 08    740-031521                       FFANTRAY-MX960-HC-S
```

show chassis hardware (MX2010 Router)

```
user@host > show chassis hardware
Hardware inventory:
Item               Version   Part number   Serial number      Description
Chassis                                    JN11E3217AFK       MX2010
Midplane           REV 01    750-044636    ABAB8506           Lower Backplane
Midplane 1         REV 01    711-044557    ZY8296             Upper Backplane
PMP                REV 03    711-032426    ACAJ1388           Power Midplane
FPM Board          REV 06    711-032349    ZX8744             Front Panel Display
PSM 4              REV 0C    740-033727    VK00254            DC 52V Power Supply
Module
PSM 5              REV 0B    740-033727    VG00015            DC 52V Power Supply
Module
PSM 6              REV 0B    740-033727    VH00097            DC 52V Power Supply
Module
```

```
PSM 7            REV 0C   740-033727   VJ00151          DC 52V Power Supply
Module
PSM 8            REV 0C   740-033727   VJ00149          DC 52V Power Supply
Module
PDM 0            REV 0B   740-038109   WA00008          DC Power Dist Module
PDM 1            REV 0B   740-038109   WA00014          DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009094134       RE-S-1800x4
Routing Engine 1 REV 02   740-041821   9009094141       RE-S-1800x4
CB 0             REV 08   750-040257   CAAB3491         Control Board
CB 1             REV 08   750-040257   CAAB3489         Control Board
SPMB 0           REV 02   711-041855   CAAA6135         PMB Board
SPMB 1           REV 02   711-041855   CAAA6137         PMB Board
SFB 0            REV 06   711-032385   ZV1828           Switch Fabric Board
SFB 1            REV 07   711-032385   ZZ2568           Switch Fabric Board
SFB 2            REV 07   711-032385   ZZ2563           Switch Fabric Board
SFB 3            REV 07   711-032385   ZZ2564           Switch Fabric Board
SFB 4            REV 07   711-032385   ZZ2580           Switch Fabric Board
SFB 5            REV 07   711-032385   ZZ2579           Switch Fabric Board
SFB 6            REV 07   711-032385   CAAB4882         Switch Fabric Board
SFB 7            REV 07   711-032385   CAAB4898         Switch Fabric Board
FPC 0            REV 33   750-028467   CAAB1919         MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAB7174         AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AMH02RE          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AMH038C          SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AMH0390          SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AMG0SUA          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AMH0579          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AMG0SGP          SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AMH04SV          SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AMH04X3          SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AMH0135          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AMH02NC          SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AMH02XB          SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AMH02PN          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AMH057Y          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AMG0JHE          SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AMH02HT          SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AMH04V4          SFP+-10G-SR
FPC 1            REV 21   750-033205   ZG5027           MPC Type 3
  CPU            REV 04   711-035209   YT4780           HMPC PMB 2G
  MIC 0          REV 03   750-033307   ZV6299           10X10GE SFPP
    PIC 0                 BUILTIN      BUILTIN          10X10GE SFPP
      Xcvr 0     REV 01   740-031980   083363A00410     SFP+-10G-SR
      Xcvr 1     REV 01   740-031980   083363A00334     SFP+-10G-SR
      Xcvr 2     REV 01   740-031980   113363A00125     SFP+-10G-SR
      Xcvr 3     REV 01   740-031980   083363A00953     SFP+-10G-SR
      Xcvr 4     REV 01   740-031980   AHR013D          SFP+-10G-SR
      Xcvr 5     REV 01   740-031980   AJ40JUR          SFP+-10G-SR
      Xcvr 6     REV 01   740-031980   AJ40JKL          SFP+-10G-SR
      Xcvr 7     REV 01   740-031980   AJ30ECK          SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   19T511100864     SFP+-10G-SR
      Xcvr 9     REV 01   740-021308   19T511100868     SFP+-10G-SR
  MIC 1          REV 03   750-033307   ZV6268           10X10GE SFPP
    PIC 2                 BUILTIN      BUILTIN          10X10GE SFPP
      Xcvr 0     REV 01   740-031980   AJC0JML          SFP+-10G-SR
      Xcvr 1     REV 01   740-031980   AJ403PC          SFP+-10G-SR
      Xcvr 2     REV 01   740-031980   AJ10N25          SFP+-10G-SR
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      Xcvr 3     REV 01   740-031980   AJ40JF4           SFP+-10G-SR
      Xcvr 4     REV 01   740-031980   AJ40JSJ           SFP+-10G-SR
      Xcvr 5     REV 01   740-031980   AJ403V7           SFP+-10G-SR
      Xcvr 6     REV 01   740-031980   AJ40JN3           SFP+-10G-SR
      Xcvr 7     REV 01   740-031980   AJ40JSU           SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   19T511100468      SFP+-10G-SR
      Xcvr 9     REV 01   740-021308   19T511101363      SFP+-10G-SR
FPC 8            REV 22   750-031089   ZT9746            MPC Type 2 3D
  CPU            REV 06   711-030884   ZS1271            MPC PMB 2G
  MIC 0          REV 26   750-028392   ABBS1150          3D 20x 1GE(LAN) SFP
    PIC 0                 BUILTIN      BUILTIN           10x 1GE(LAN) SFP
      Xcvr 0     REV 01   740-031851   PLG023C           SFP-SX
      Xcvr 1     REV 01   740-031851   PLG09C6           SFP-SX
      Xcvr 2     REV 02   740-011613   AM0950SF9L7       SFP-SX
      Xcvr 3     REV 02   740-011613   AM1001SFN1H       SFP-SX
      Xcvr 4     REV 02   740-011613   AM1001SFM9D       SFP-SX
      Xcvr 5     REV 02   740-011613   AM1001SFLTJ       SFP-SX
      Xcvr 6     REV 01   740-031851   AC1108S03L9       SFP-SX
      Xcvr 7     REV 01   740-031851   AC1102S00NC       SFP-SX
      Xcvr 8     REV 01   740-031851   AC1102S00MX       SFP-SX
      Xcvr 9     REV 01   740-031851   AC1102S0085       SFP-SX
    PIC 1                 BUILTIN      BUILTIN           10x 1GE(LAN) SFP
      Xcvr 0     REV 01   740-031851   AC1102S00KU       SFP-SX
      Xcvr 1     REV 01   740-031851   AC1102S00NG       SFP-SX
      Xcvr 2     REV 01   740-031851   AC1102S00K3       SFP-SX
      Xcvr 3     REV 01   740-031851   AC1102S008R       SFP-SX
      Xcvr 4     REV 01   740-031851   AM1107SUFVJ       SFP-SX
      Xcvr 5     REV 01   740-031851   AC1108S03LG       SFP-SX
  MIC 1          REV 26   750-028387   ABBR9582          3D 4x 10GE  XFP
    PIC 2                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0              NON-JNPR     T10A91703         XFP-10G-SR
      Xcvr 1              NON-JNPR     T09L42604         XFP-10G-SR
    PIC 3                 BUILTIN      BUILTIN           2x 10GE  XFP
FPC 9            REV 11   750-036284   ZL3591            MPC 3D 16x 10GE EM
  CPU            REV 10   711-029089   ZL0513            AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   1YT517101825      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   1YT517101821      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   1YT517101682      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ALQ13R6           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   1YT517101828      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   1YT517101716      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   1YT517101732      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ALP0TR1           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   1YT517101741      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   1YT517101829      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   1YT517101669      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ALQ14E3           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   1YT517101826      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   1YT517101817      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   1YT517101735      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ALQ159A           SFP+-10G-SR
ADC 0            REV 05   750-043596   CAAC2073          Adapter Card
ADC 1            REV 01   750-043596   ZV4117            Adapter Card
ADC 8            REV 01   750-043596   ZV4107            Adapter Card
ADC 9            REV 02   750-043596   ZW1555            Adapter Card
Fan Tray 0       REV 2A   760-046960   ACAY0015          172mm FanTray - 6 Fans
Fan Tray 1       REV 2A   760-046960   ACAY0019          172mm FanTray - 6 Fans
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Fan Tray 2       REV 2A   760-046960   ACAY0020         172mm FanTray - 6 Fans
Fan Tray 3       REV 2A   760-046960   ACAY0021         172mm FanTray - 6 Fans
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show chassis hardware detail (MX2010 Router)

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user@host > show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN11E233DAFK     MX2010
Midplane         REV 26   750-044636   ABAB9357         Lower Backplane
Midplane 1       REV 01   711-044557   ABAB8643         Upper Backplane
PMP              REV 04   711-032426   ACAJ1677         Power Midplane
FPM Board        REV 08   760-044634   ABBV9726         Front Panel Display
PSM 0            REV 01   740-045050   1E02224000P      DC 52V Power Supply
Module
PSM 1            REV 01   740-045050   1E02224000M      DC 52V Power Supply
Module
PSM 2            REV 01   740-045050   1E022240010      DC 52V Power Supply
Module
PSM 3            REV 01   740-045050   1E02224000G      DC 52V Power Supply
Module
PSM 4            REV 01   740-045050   1E022240013      DC 52V Power Supply
Module
PSM 5            REV 01   740-045050   1E022240007      DC 52V Power Supply
Module
PSM 6            REV 01   740-045050   1E02224001C      DC 52V Power Supply
Module
PSM 7            REV 01   740-045050   1E02224001D      DC 52V Power Supply
Module
PSM 8            REV 01   740-045050   1E02224001B      DC 52V Power Supply
Module
PDM 0            REV 01   740-045234   1E262250067      DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009099704       RE-S-1800x4
  ad0     3831 MB  UGB30SFA4000T1      SFA4000T1 00000651 Compact Flash
  ad1    30533 MB  UGB94BPH32H0S1-KCI  11000019592      Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel            uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087    uhub1
  DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02   740-041821   9009099706       RE-S-1800x4
  ad0     3998 MB  Virtium - TuffDrive VCF P1T0200262860208 114 Compact Flash
  ad1    30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000404 Disk 1
CB 0             REV 13   750-040257   CAAF8436         Control Board
CB 1             REV 13   750-040257   CAAF8434         Control Board
SPMB 0           REV 02   711-041855   ABBV3825         PMB Board
SPMB 1           REV 02   711-041855   ABBV3833         PMB Board
SFB 0            REV 05   711-044466   ABBX5682         Switch Fabric Board
SFB 1            REV 05   711-044466   ABBX5676         Switch Fabric Board
SFB 2            REV 05   711-044466   ABBX5665         Switch Fabric Board
SFB 3            REV 05   711-044466   ABBX5699         Switch Fabric Board
SFB 4            REV 05   711-044466   ABBX5603         Switch Fabric Board
SFB 5            REV 05   711-044466   ABBX5587         Switch Fabric Board
SFB 6            REV 05   711-044466   ABBX5607         Switch Fabric Board
SFB 7            REV 05   711-044466   ABBX5669         Switch Fabric Board
FPC 0            REV 09   750-037355   CAAF0924         MPC Type 4-2
  CPU            REV 08   711-035209   CAAB9842         HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN          4x10GE SFPP
    Xcvr 0       REV 01   740-021308   19T511101656     SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AMA04RU          SFP+-10G-SR
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      Xcvr 2       REV 01   740-031980   193363A00558      SFP+-10G-SR
      Xcvr 3       REV 01   740-031980   B10M00202         SFP+-10G-SR
    PIC 1                   BUILTIN      BUILTIN           1X100GE CFP
      Xcvr 0                NON-JNPR     X12J00328         CFP-100G-SR10
    PIC 2                   BUILTIN      BUILTIN           4x10GE SFPP
      Xcvr 0       REV 01   740-031980   AMA088W           SFP+-10G-SR
      Xcvr 1       REV 01   740-031980   B10L04211         SFP+-10G-SR
      Xcvr 2       REV 01   740-021308   19T511101602      SFP+-10G-SR
      Xcvr 3       REV 01   740-031980   B10L04151         SFP+-10G-SR
    PIC 3                   BUILTIN      BUILTIN           1X100GE CFP
  Xcvr 0                NON-JNPR     X12J00332         CFP-100G-SR10
  FPC 1            REV 18   750-033205   ZE0128            MPC Type 3
    CPU            REV 06   711-035209   ZG5431            HMPC PMB 2G
    MIC 0          REV 15   750-033199   ZP6435            1X100GE CFP
      PIC 0                 BUILTIN      BUILTIN           1X100GE CFP
        Xcvr 0     REV 01   740-032210   J11E46118         CFP-100G-LR4
    MIC 1          REV 15   750-033199   ZP6442            1X100GE CFP
      PIC 2                 BUILTIN      BUILTIN           1X100GE CFP
        Xcvr 0     REV 01   740-032210   UMN03T4           CFP-100G-LR4
  FPC 2            REV 16   750-037358   CAAL1001          MPC Type 4-1
    CPU            REV 08   711-035209   CAAK7927          HMPC PMB 2G
    PIC 0                   BUILTIN      BUILTIN           8X10GE SFPP
      Xcvr 0       REV 01   740-031980   193363A00589      SFP+-10G-SR
      Xcvr 1       REV 01   740-021308   973152A00028      SFP+-10G-SR
      Xcvr 2       REV 01   740-031980   193363A00376      SFP+-10G-SR
      Xcvr 3       REV 01   740-021308   973152A00016      SFP+-10G-SR
      Xcvr 4       REV 01   740-031980   193363A00499      SFP+-10G-SR
      Xcvr 5       REV 01   740-021308   973152A00039      SFP+-10G-SR
      Xcvr 6       REV 01   740-031980   B11E01239         SFP+-10G-SR
      Xcvr 7       REV 01   740-021308   973152A00058      SFP+-10G-SR
    PIC 1                   BUILTIN      BUILTIN           8X10GE SFPP
      Xcvr 0       REV 01   740-031980   B10M00075         SFP+-10G-SR
      Xcvr 1       REV 01   740-021308   973152A00014      SFP+-10G-SR
      Xcvr 2       REV 01   740-031980   AMA0638           SFP+-10G-SR
      Xcvr 3       REV 01   740-021308   973152A00063      SFP+-10G-SR
      Xcvr 4       REV 01   740-031980   AMA0629           SFP+-10G-SR
      Xcvr 5       REV 01   740-021308   973152A00053      SFP+-10G-SR
      Xcvr 6       REV 01   740-031980   193363A00344      SFP+-10G-SR
      Xcvr 7       REV 01   740-021308   973152A00046      SFP+-10G-SR
    PIC 2                   BUILTIN      BUILTIN           8X10GE SFPP
      Xcvr 0       REV 01   740-031980   AMA062M           SFP+-10G-SR
      Xcvr 1       REV 01   740-021308   973152A00080      SFP+-10G-SR
      Xcvr 2       REV 01   740-031980   193363A00580      SFP+-10G-SR
      Xcvr 3       REV 01   740-021308   973152A00064      SFP+-10G-SR
      Xcvr 4       REV 01   740-031980   093363A01494      SFP+-10G-SR
      Xcvr 5       REV 01   740-021308   973152A00020      SFP+-10G-SR
      Xcvr 6       REV 01   740-031980   123363A00047      SFP+-10G-SR
      Xcvr 7       REV 01   740-021308   973152A00072      SFP+-10G-SR
    PIC 3                   BUILTIN      BUILTIN           8X10GE SFPP
      Xcvr 0       REV 01   740-021308   03DZ06A01033      SFP+-10G-SR
      Xcvr 1       REV 01   740-021308   973152A00022      SFP+-10G-SR
      Xcvr 2       REV 01   740-021308   03DZ06A01026      SFP+-10G-SR
      Xcvr 3       REV 01   740-021308   973152A00013      SFP+-10G-SR
      Xcvr 4       REV 01   740-021308   03DZ06A01028      SFP+-10G-SR
      Xcvr 5       REV 01   740-021308   973152A00079      SFP+-10G-SR
      Xcvr 6       REV 01   740-021308   03DZ06A01018      SFP+-10G-SR
      Xcvr 7       REV 01   740-021308   973152A00025      SFP+-10G-SR
  FPC 3            REV 33   750-028467   CAAF5400          MPC 3D 16x 10GE
    CPU            REV 11   711-029089   CAAH7626          AMPC PMB
    PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0       REV 01   740-021308   973152A00066      SFP+-10G-SR
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    Xcvr 1       REV 01   740-021308   973152A00021      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   973152A00062      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00027      SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   973152A00065      SFP+-10G-SR
 Xcvr 1       REV 01   740-021308   973152A00069      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   973152A00026      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00003      SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   973152A00035      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   973152A00004      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   973152A00049      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00055      SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   973152A00010      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   973152A00001      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   973152A00073      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00012      SFP+-10G-SR
FPC 4            REV 21   750-033205   ZG5028            MPC Type 3
  CPU            REV 05   711-035209   YX3911            HMPC PMB 2G
  MIC 0          REV 03   750-036233   ZL2036            2X40GE QSFP
    PIC 0                 BUILTIN      BUILTIN           2X40GE QSFP
      Xcvr 0     REV 01   740-032986   QB220708          QSFP+-40G-SR4
      Xcvr 1     REV 01   740-032986   QB220735          QSFP+-40G-SR4
  MIC 1          REV 03   750-036233   ZL2028            2X40GE QSFP
    PIC 2                 BUILTIN      BUILTIN           2X40GE QSFP
      Xcvr 0     REV 01   740-032986   QB220727          QSFP+-40G-SR4
      Xcvr 1     REV 01   740-032986   QB220715          QSFP+-40G-SR4
FPC 5            REV 11   750-037358   CAAE2196          MPC Type 4-1
  CPU            REV 08   711-035209   CAAD9074          HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           8X10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA062S           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AMA062P           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AMA052R           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AMA0632           SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   193363A00564      SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   193363A00229      SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00363      SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   193363A00278      SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           8X10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA04CC           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AD0927A001W       SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AMA04N2           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AMA062U           SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   193363A00491      SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   183363A01511      SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00565      SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   193363A00405      SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           8X10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA07QX           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AMA06MS           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00318      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   193363A00402      SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   193363A00174      SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   193363A00388      SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00377      SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   193363A00234      SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           8X10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA062T           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   193363A00550      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00364      SFP+-10G-SR
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Xcvr 3       REV 01   740-031980   AMA0630          SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   193363A00509     SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   193363A00459     SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   113363A00191     SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   193363A00352     SFP+-10G-SR
FPC 6            REV 33   750-028467   CAAF5552         MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAH7601         AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AD0927A0036      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AD0927A003M      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AD0927A003G      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AD0927A0031      SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   193363A00331     SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   193363A00325     SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00417     SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   183363A02509     SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   T09K75140        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11A04356        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01952        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K01914        SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   T09K75157        SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   T09K75194        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01926        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K01936        SFP+-10G-SR
FPC 7            REV 16   750-037358   CAAL1012         MPC Type 4-1
  CPU            REV 08   711-035209   CAAJ3851         HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN          8X10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA04NK          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11F00260        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11E02192        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AMA04CP          SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJ40JKK          SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   B11F00238        SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B10M00275        SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   193363A00211     SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          8X10GE SFPP
    Xcvr 0       REV 01   740-031980   B11D05577        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11G00586        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AMA08B7          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AMA04Q0          SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   B11D05840        SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   B11E00467        SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11E00029        SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   19T511101712     SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          8X10GE SFPP
    Xcvr 0       REV 01   740-031980   193363A00568     SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B10M00166        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B10M00212        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11D05823        SFP+-10G-SR
    Xcvr 4       REV 01   740-021308   03DZ06A01005     SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   03DZ06A01003     SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   03DZ06A01009     SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   03DZ06A01004     SFP+-10G-SR
PIC 3                   BUILTIN      BUILTIN          8X10GE SFPP
    Xcvr 0       REV 01   740-021308   03DZ06A01017     SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   03DZ06A01016     SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   03DZ06A01024     SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   03DZ06A01008     SFP+-10G-SR
```



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    Xcvr 4        REV 01    740-030658   AD0946A02UH       SFP+-10G-USR
    Xcvr 5        REV 01    740-021308   T09J67913         SFP+-10G-SR
    Xcvr 6        REV 01    740-021308   AD0837ES09G       SFP+-10G-SR
    Xcvr 7        REV 01    740-021308   03DZ06A01015      SFP+-10G-SR
FPC 8             REV 03    750-045372   CAAD3111          MPC Type 3
  CPU             REV 08    711-035209   CAAD8033          HMPC PMB 2G
  MIC 0           REV 03    750-036233   ZL2032            2X40GE QSFP
    PIC 0                   BUILTIN      BUILTIN           2X40GE QSFP
      Xcvr 0      REV 01    740-032986   QB230273          QSFP+-40G-SR4
      Xcvr 1      REV 01    740-032986   QB230254          QSFP+-40G-SR4
  MIC 1           REV 03    750-036233   ZL2021            2X40GE QSFP
    PIC 2                   BUILTIN      BUILTIN           2X40GE QSFP
      Xcvr 0      REV 01    740-032986   QB390962          QSFP+-40G-SR4
      Xcvr 1      REV 01    740-032986   QB390960          QSFP+-40G-SR4
FPC 9             REV 09    750-037355   CAAF1531          MPC Type 4-2
  CPU             REV 08    711-035209   CAAB9927          HMPC PMB 2G
  PIC 0                     BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0        REV 01    740-031980   193363A00525      SFP+-10G-SR
    Xcvr 1        REV 01    740-031980   193363A00504      SFP+-10G-SR
    Xcvr 2        REV 01    740-031980   193363A00368      SFP+-10G-SR
    Xcvr 3        REV 01    740-031980   AJ40JSS           SFP+-10G-SR
  PIC 1                     BUILTIN      BUILTIN           1X100GE CFP
  PIC 2                     BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0        REV 01    740-031980   123363A00042      SFP+-10G-SR
    Xcvr 1        REV 01    740-031980   B10M00023         SFP+-10G-SR
    Xcvr 2        REV 01    740-031980   AJ802EM           SFP+-10G-SR
    Xcvr 3        REV 01    740-031980   B11E02348         SFP+-10G-SR
  PIC 3                     BUILTIN      BUILTIN           1X100GE CFP
ADC 0             REV 13    750-043596   ABBX5532          Adapter Card
ADC 1             REV 13    750-043596   ABBX5550          Adapter Card
ADC 2             REV 13    750-043596   ABBX5571          Adapter Card
ADC 3             REV 13    750-043596   ABBX5568          Adapter Card
ADC 4             REV 13    750-043596   ABBX5556          Adapter Card
ADC 5             REV 13    750-043596   ABBX5553          Adapter Card
ADC 6             REV 13    750-043596   ABBX5541          Adapter Card
ADC 7             REV 13    750-043596   ABBX5578          Adapter Card
ADC 8             REV 13    750-043596   ABBX5560          Adapter Card
ADC 9             REV 07    750-043596   ABBV7188          Adapter Card
Fan Tray 0        REV 03    760-046960   ACAY0127          172mm FanTray - 6 Fans
Fan Tray 1        REV 2A    760-046960   ACAY0068          172mm FanTray - 6 Fans
Fan Tray 2        REV 2A    760-046960   ACAY0072          172mm FanTray - 6 Fans
Fan Tray 3        REV 2A    760-046960   ACAY0070          172mm FanTray - 6 Fans
```

show chassis hardware extensive (MX2010 Router)

```
user@host > show chassis hardware extensive
Hardware inventory:
Item              Version   Part number  Serial number     Description
Chassis                                  JN11E233DAFK      MX2010
 Jedec Code:    0x7fb0              EEPROM Version:     0x02
                                    S/N:                JN11E233DAFK
 Assembly ID:   0x0557              Assembly Version:   00.00
 Date:          00-00-0000          Assembly Flags:     0x00
 ID: MX2010
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 45 32 33 33 44 41 46 4b 00 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
```

```
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 26   750-044636   ABAB9357          Lower Backplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-044636        S/N:               ABAB9357
 Assembly ID:  0x0b66            Assembly Version:  01.26
 Date:         08-28-2012        Assembly Flags:    0x00
 Version:      REV 26            CLEI Code:         PROTOXCLEI
 ID: Lower Backplane             FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ad 01 08 00 2c 21 72 70 a0 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 66 01 1a 52 45 56 20 32 36 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 36 33 36 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 39 33 35 37 00 1c 08 07
  Address 0x30: dc ff ff ff ad 01 08 00 2c 21 72 70 a0 00 ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
Midplane 1       REV 01   711-044557   ABAB8643          Upper Backplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-044557        S/N:               ABAB8643
 Assembly ID:  0x0b65            Assembly Version:  01.01
 Date:         07-27-2012        Assembly Flags:    0x00
 Version:      REV 01
 ID: Upper Backplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b 65 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 35 35 37 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 38 36 34 33 00 1b 07 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP              REV 04   711-032426   ACAJ1677          Power Midplane
Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-032426        S/N:               ACAJ1677
 Assembly ID:  0x045d            Assembly Version:  01.04
 Date:         07-20-2012        Assembly Flags:    0x00
 Version:      REV 04
 ID: Power Midplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 4a 31 36 37 37 00 14 07 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 08   760-044634   ABBV9726          Front Panel Display
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          760-044634        S/N:               ABBV9726
```

```
 Assembly ID:  0x0b64           Assembly Version:  01.08
 Date:         09-10-2012       Assembly Flags:    0x00
 Version:      REV 08           CLEI Code:         IPMYA4EJRA
 ID: Front Panel Display        FRU Model Number:  MX2010-CRAFT-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 64 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 36 30 2d 30 34 34 36 33 34 00 00
  Address 0x20: 53 2f 4e 20 41 42 42 56 39 37 32 36 00 0a 09 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 4d 59 41 34 45 4a 52 41 4d
  Address 0x50: 58 32 30 31 30 2d 43 52 41 46 54 2d 53 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 93 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0            REV 01   740-045050   1E02224000P       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-045050       S/N:               1E02224000P
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         12-06-2012       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         XXXXXXXXXX
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-HC-DC-S-A
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 30 35 30 00 00
  Address 0x20: 31 45 30 32 32 32 34 30 30 30 50 00 00 06 0c 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 58 58 58 58 58 58 58 58 58 58 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 48 43 2d 44 43 2d
  Address 0x60: 53 2d 41 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1            REV 01   740-045050   1E02224000M       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-045050       S/N:               1E02224000M
Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         12-06-2012       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         XXXXXXXXXX
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-HC-DC-S-A
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 30 35 30 00 00
  Address 0x20: 31 45 30 32 32 32 34 30 30 30 4d 00 00 06 0c 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 58 58 58 58 58 58 58 58 58 58 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 48 43 2d 44 43 2d
  Address 0x60: 53 2d 41 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4a 00 00 00 00 00 00 00 00 00 00 00 00
...
PDM 0            REV 01   740-045234   1E262250067       DC Power Dist Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-045234       S/N:               1E262250067
 Assembly ID:  0x047b           Assembly Version:  01.01
 Date:         06-28-2012       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAJSKAA
 ID: DC Power Dist Module       FRU Model Number:  MX2000-PDM-DC-S-A
```

```
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 04 7b 01 01 52 45 56 20 30 31 00 00
   Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 32 33 34 00 00
   Address 0x20: 31 45 32 36 32 32 35 30 30 36 37 00 00 1c 06 07
   Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 49 50 55 50 41 4a 53 4b 41 41 4d
   Address 0x50: 58 32 30 30 30 2d 50 44 4d 2d 44 43 2d 53 2d 41
   Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 89 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 02   740-041821   9009099704        RE-S-1800x4
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          740-041821        S/N:               9009099704
  Assembly ID:  0x09c0            Assembly Version:  01.02
  Date:         03-15-2012        Assembly Flags:    0x00
  Version:      REV 02
  ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
  Board Information Record:
   Address 0x00: 54 32 30 32 37 44 41 2d 34 34 47 42 23 41 23 00
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 09 c0 01 02 52 45 56 20 30 32 00 00
   Address 0x10: 00 00 00 00 37 34 30 2d 30 34 31 38 32 31 00 00
   Address 0x20: 39 30 30 39 30 39 39 37 30 34 00 00 00 0f 03 07
   Address 0x30: dc ff ff ff 54 32 30 32 37 44 41 2d 34 34 47 42
   Address 0x40: 23 41 23 00 01 00 00 00 00 00 00 00 00 00 00 52
   Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
   Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 8c ff ff ff ff ff ff ff ff ff ff ff ff
   ad0    3831 MB  UGB30SFA4000T1       SFA4000T1 00000651 Compact Flash
   ad1   30533 MB  UGB94BPH32H0S1-KCI   11000019592       Disk 1
   usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
   usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
   DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
   DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
   DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
   DIMM 3         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02   740-041821   9009099706        RE-S-1800x4
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          740-041821        S/N:               9009099706
  Assembly ID:  0x09c0            Assembly Version:  01.02
  Date:         02-23-2012        Assembly Flags:    0x00
  Version:      REV 02
  ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
  Board Information Record:
   Address 0x00: 54 32 30 32 37 44 41 2d 34 34 47 42 23 41 23 00
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 09 c0 01 02 52 45 56 20 30 32 00 00
   Address 0x10: 00 00 00 00 37 34 30 2d 30 34 31 38 32 31 00 00
  Address 0x20: 39 30 30 39 30 39 39 37 30 36 00 00 00 17 02 07
   Address 0x30: dc ff ff ff 54 32 30 32 37 44 41 2d 34 34 47 42
   Address 0x40: 23 41 23 00 01 00 00 00 00 00 00 00 00 00 00 52
   Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
   Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 8c ff ff ff ff ff ff ff ff ff ff ff ff
   ad0    3998 MB  Virtium - TuffDrive VCF P1T0200262860208 114 Compact Flash
   ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000404 Disk 1
CB 0             REV 13   750-040257   CAAF8436          Control Board
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          750-040257        S/N:               CAAF8436
  Assembly ID:  0x0b26            Assembly Version:  01.13
```



```
 Date:         08-29-2012        Assembly Flags:    0x00
 Version:      REV 13            CLEI Code:         PROTOXCLEI
 ID: Control Board               FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 26 01 0d 52 45 56 20 31 33 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 30 32 35 37 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 46 38 34 33 36 00 1d 08 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
...
SPMB 0           REV 02   711-041855   ABBV3825          PMB Board
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-041855        S/N:               ABBV3825
 Assembly ID:  0x0b29            Assembly Version:  01.02
 Date:         08-14-2012        Assembly Flags:    0x00
 Version:      REV 02
 ID: PMB Board
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b 29 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 31 38 35 35 00 00
  Address 0x20: 53 2f 4e 20 41 42 42 56 33 38 32 35 00 0e 08 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
...
SFB 0            REV 05   711-044466   ABBX5682          Switch Fabric Board
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          711-044466        S/N:               ABBX5682
 Assembly ID:  0x0b25            Assembly Version:  01.05
 Date:         09-07-2012        Assembly Flags:    0x00
 Version:      REV 05            CLEI Code:         PROTOXCLEI
 ID: Switch Fabric Board         FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 25 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 34 36 36 00 00
  Address 0x20: 53 2f 4e 20 41 42 42 58 35 36 38 32 00 07 09 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 00 00 00 01 00 00 00 00 00 00 48 00
...
FPC 0            REV 09   750-037355   CAAF0924          MPC Type 4-2
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-037355        S/N:               CAAF0924
 Assembly ID:  0x0b4e            Assembly Version:  01.09
 Date:         05-21-2012        Assembly Flags:    0x00
 Version:      REV 09            CLEI Code:         PROTOXCLEI
 ID: MPC Type 4-2                FRU Model Number:  MPC4E-2CGE-8XGE
 Board Information Record:
```

```
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 4e 01 09 52 45 56 20 30 39 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 33 35 35 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 46 30 39 32 34 00 15 05 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 4d
  Address 0x50: 50 43 34 45 2d 32 43 47 45 2d 38 58 47 45 00 00
  Address 0x60: 00 00 00 00 00 00 30 39 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c6 ff ff ff ff ff ff ff ff ff ff ff ff
  CPU            REV 08   711-035209   CAAB9842          HMPC PMB 2G
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          711-035209       S/N:               CAAB9842
 Assembly ID:  0x0b04           Assembly Version:  01.08
 Date:         05-17-2012       Assembly Flags:    0x00
 Version:      REV 08
 ID: HMPC PMB 2G
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b 04 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 35 32 30 39 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 42 39 38 34 32 00 11 05 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
  PIC 0                   BUILTIN      BUILTIN           4x10GE SFPP
 Jedec Code:   0x0000           EEPROM Version:    0x00
 P/N:          BUILTIN          S/N:               BUILTIN
 Assembly ID:  0x0a53           Assembly Version:  00.00
 Date:         00-00-0000       Assembly Flags:    0x00
 ID: 4x10GE SFPP
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 0a 53 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 4d 58 43 00
  Address 0x20: 42 55 49 4c 54 49 4e 00 4d 58 43 00 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 02 ae 64 00 00 00 00 0a 52 00 00
    Xcvr 0       REV 01   740-021308   19T511101656      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AMA04RU           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00558      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B10M00202         SFP+-10G-SR
...
ADC 0            REV 13   750-043596   ABBX5532          Adapter Card
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          750-043596       S/N:               ABBX5532
 Assembly ID:  0x0b3d           Assembly Version:  01.13
 Date:         09-12-2012       Assembly Flags:    0x00
 Version:      REV 13           CLEI Code:         IPUCBA8CAA
 ID: Adapter Card               FRU Model Number:  MX2000-LC-ADAPTER
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 3d 01 0d 52 45 56 20 31 33 00 00
```



```
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 33 35 39 36 00 00
  Address 0x20: 53 2f 4e 20 41 42 42 58 35 35 33 32 00 0c 09 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 43 42 41 38 43 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 4c 43 2d 41 44 41 50 54 45 52
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 3a 00 00 00 00 00 00 00 00 00 00 00 00
...
```

show chassis hardware models (MX2010 Router)

```
user@host > show chassis hardware models
Hardware inventory:
Item                Version   Part number   Serial number      FRU model number
FPM Board           REV 06    711-032349    ZX8744             711-032349
PSM 4               REV 0C    740-033727    VK00254            0000000000000000000000
PSM 5               REV 0B    740-033727    VG00015            0000000000000000000000
PSM 6               REV 0B    740-033727    VH00097            0000000000000000000000
PSM 7               REV 0C    740-033727    VJ00151            0000000000000000000000
PSM 8               REV 0C    740-033727    VJ00149            0000000000000000000000
PDM 0               REV 0B    740-038109    WA00008
PDM 1               REV 0B    740-038109    WA00014
Routing Engine 0 REV 02    740-041821    9009094134         RE-S-1800X4-16G-S
Routing Engine 1 REV 02    740-041821    9009094141         RE-S-1800X4-16G-S
CB 0                REV 08    750-040257    CAAB3491           750-040257
CB 1                REV 08    750-040257    CAAB3489           750-040257
SFB 0               REV 06    711-032385    ZV1828             711-032385
SFB 1               REV 07    711-032385    ZZ2568             711-032385
SFB 2               REV 07    711-032385    ZZ2563             711-032385
SFB 3               REV 07    711-032385    ZZ2564             711-032385
SFB 4               REV 07    711-032385    ZZ2580             711-032385
SFB 5               REV 07    711-032385    ZZ2579             711-0323856
SFB 6               REV 07    711-032385    CAAB4882           711-044170
SFB 7               REV 07    711-032385    CAAB4898           711-044170
FPC 0               REV 33    750-028467    CAAB1919           MPC-3D-16XGE-SFPP
FPC 1               REV 21    750-033205    ZG5027             MX-MPC3-3D
  MIC 0             REV 03    750-033307    ZV6299             MIC3-3D-10XGE-SFPP
  MIC 1             REV 03    750-033307    ZV6268             MIC3-3D-10XGE-SFPP
FPC 8               REV 22    750-031089    ZT9746             MX-MPC2-3D
  MIC 0             REV 26    750-028392    ABBS1150           MIC-3D-20GE-SFP
  MIC 1             REV 26    750-028387    ABBR9582           MIC-3D-4XGE-XFP
FPC 9               REV 11    750-036284    ZL3591             MPCE-3D-16XGE-SFPP
ADC 0               REV 05    750-043596    CAAC2073           750-043596
ADC 1               REV 01    750-043596    ZV4117             750-043596
ADC 8               REV 01    750-043596    ZV4107             750-043596
ADC 9               REV 02    750-043596    ZW1555             750-043596
Fan Tray 0          REV 2A    760-046960    ACAY0015
Fan Tray 1          REV 2A    760-046960    ACAY0019
Fan Tray 2          REV 2A    760-046960    ACAY0020
Fan Tray 3          REV 2A    760-046960    ACAY0021
```

show chassis hardware clei-models (MX2010 Routers)

```
user@host > show chassis hardware clei-models
Hardware inventory:
Item                Version   Part number   CLEI code          FRU model number
FPM Board           REV 06    711-032349    PROTOXCLEI         711-032349
PSM 4               REV 0C    740-033727    0000000000         0000000000000000000000
PSM 5               REV 0B    740-033727    0000000000         0000000000000000000000
PSM 6               REV 0B    740-033727    0000000000         0000000000000000000000
PSM 7               REV 0C    740-033727    0000000000         0000000000000000000000
```

```
PSM 8             REV 0C    740-033727    0000000000         00000000000000000000000
PDM 0             REV 0B    740-038109
PDM 1             REV 0B    740-038109
Routing Engine 0 REV 02    740-041821                       RE-S-1800X4-16G-S
Routing Engine 1 REV 02    740-041821                       RE-S-1800X4-16G-S
CB 0              REV 08    750-040257    PROTOXCLEI         750-040257
CB 1              REV 08    750-040257    PROTOXCLEI         750-040257
SFB 0             REV 06    711-032385    PROTOXCLEI         711-032385
SFB 1             REV 07    711-032385    PROTOXCLEI         711-032385
SFB 2             REV 07    711-032385    PROTOXCLEI         711-032385
SFB 3             REV 07    711-032385    PROTOXCLEI         711-032385
SFB 4             REV 07    711-032385    PROTOXCLEI         711-032385
SFB 5             REV 07    711-032385    PROTOXCLEI         711-0323856
SFB 6             REV 07    711-032385    PROTOXCLEI         711-044170
SFB 7             REV 07    711-032385    PROTOXCLEI         711-044170
FPC 0             REV 33    750-028467                       MPC-3D-16XGE-SFPP
FPC 1             REV 21    750-033205                       MX-MPC3-3D
  MIC 0           REV 03    750-033307    PROTOXCLEI         MIC3-3D-10XGE-SFPP
  MIC 1           REV 03    750-033307    PROTOXCLEI         MIC3-3D-10XGE-SFPP
FPC 8             REV 22    750-031089    COUIBAYBAA         MX-MPC2-3D
  MIC 0           REV 26    750-028392    COUIA15BAA         MIC-3D-20GE-SFP
  MIC 1           REV 26    750-028387    COUIA16BAA         MIC-3D-4XGE-XFP
FPC 9             REV 11    750-036284    CMUIACGBAA         MPCE-3D-16XGE-SFPP
ADC 0             REV 05    750-043596    PROTOXCLEI         750-043596
ADC 1             REV 01    750-043596    PROTOXCLEI         750-043596
ADC 8             REV 01    750-043596    PROTOXCLEI         750-043596
ADC 9             REV 02    750-043596    PROTOXCLEI         750-043596
Fan Tray 0        REV 2A    760-046960
Fan Tray 1        REV 2A    760-046960
Fan Tray 2        REV 2A    760-046960
Fan Tray 3        REV 2A    760-046960
```

show chassis hardware (MX2010 Routers with MPC6E and OTN MIC)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version   Part number   Serial number      Description
Chassis                                   JN11C9AFEAFK       MX2010
Midplane          REV 35    750-044636    ABAB9188           Lower Backplane
Midplane 1        REV 02    711-044557    ABAB8729           Upper Backplane
PMP               REV 04    711-032426    ACAJ2432           Power Midplane
FPM Board         REV 09    760-044634    ABCA4314           Front Panel Display
PSM 0             REV 01    740-050037    1EDB321015C        DC 52V Power Supply
Module
PSM 1             REV 01    740-050037    1EDB321015J        DC 52V Power Supply
Module
PSM 2             REV 01    740-050037    1EDB32000K8        DC 52V Power Supply
Module
PSM 3             REV 01    740-050037    1EDB32101JW        DC 52V Power Supply
Module
PSM 4             REV 01    740-050037    1EDB321015G        DC 52V Power Supply
Module
PSM 5             REV 01    740-050037    1EDB32101HH        DC 52V Power Supply
Module
PSM 6             REV 01    740-050037    1EDB32101HD        DC 52V Power Supply
Module
PSM 7             REV 01    740-050037    1EDB321015F        DC 52V Power Supply
Module
PSM 8             REV 01    740-050037    1EDB321015B        DC 52V Power Supply
Module
PDM 0             REV 03    740-045234    1EFA3220433        DC Power Dist Module
```

```
PDM 1            REV 03   740-045234   1EFA3220425      DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009115685       RE-S-1800x4
Routing Engine 1 REV 02   740-041821   9009099711       RE-S-1800x4
CB 0             REV 23   750-040257   CABE8395         Control Board
CB 1             REV 12   750-040257   CAAD9499         Control Board
SPMB 0           REV 02   711-041855   ABCG8426         PMB Board
SPMB 1           REV 02   711-041855   ABBS1481         PMB Board
SFB 0            REV 06   711-044466   ABCD5013         Switch Fabric Board
SFB 1            REV 06   711-044466   ABCD5160         Switch Fabric Board
SFB 2            REV 06   711-044466   ABCD5175         Switch Fabric Board
SFB 3            REV 06   711-044466   ABCD4938         Switch Fabric Board
SFB 4            REV 06   711-044466   ABCD4944         Switch Fabric Board
SFB 5            REV 06   711-044466   ABCD4968         Switch Fabric Board
SFB 6            REV 06   711-044466   ABCD5267         Switch Fabric Board
SFB 7            REV 06   711-044466   ABCD4997         Switch Fabric Board
FPC 0            REV 59   750-044130   ABCT7676         MPC6E 3D
  CPU            REV 10   711-045719   ABCK8527         RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7810         MPC6E XL
  XLM 1          REV 13   711-046638   ABCT7811         MPC6E XL
FPC 2            REV 27   750-033205   ZL6014           MPCE Type 3 3D
  CPU            REV 07   711-035209   ZK9068           HMPC PMB 2G
  MIC 0          REV 14   750-033196   CAAW9214         1X100GE CXP
    PIC 0                 BUILTIN      BUILTIN          1X100GE CXP
      Xcvr 0     REV 01   740-046563   XC49FC030        CFP2-100G-SR10
  MIC 1          REV 18   750-033199   CAAC3231         1X100GE CFP
    PIC 2                 BUILTIN      BUILTIN          1X100GE CFP
FPC 3            REV 59   750-044130   ABCT7682         MPC6E 3D
  CPU            REV 10   711-045719   ABCK8531         RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7818         MPC6E XL
  XLM 1          REV 13   711-046638   ABCT7819         MPC6E XL
FPC 4            REV 33   750-044130   ABBY9278         MPC6E 3D
  CPU            REV 09   711-045719   ABBY8677         RMPC PMB
  XLM 0          REV 06.2.00 711-046638 ABBY8844        MPC6E XL
  XLM 1          REV 06.2.00 711-046638 ABBY8830        MPC6E XL
FPC 5            REV 59   750-044130   ABCT7675         MPC6E 3D
  CPU            REV 10   711-045719   ABCK8526         RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7808         MPC6E XL
  XLM 1          REV 13   711-046638   ABCT7809         MPC6E XL
FPC 6            REV 30   750-028467   ZM4986           MPC 3D 16x 10GE
 CPU            REV 10   711-029089   ZP6541           AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43GAC          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   ALM0A6D          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AQF0RB3          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   153363A00333     SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AN10KYE          SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   APK04YM          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AQF0H44          SFP+-10G-SR
FPC 8            REV 38   750-031090   CABF7313         MPC Type 2 3D EQ
  CPU            REV 08   711-030884   CABE6727         MPC PMB 2G
  MIC 0          REV 18   750-028380   YK8253           3D 2x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN          1x 10GE XFP
      Xcvr 0     REV 03   740-014289   AD1148M00TP      XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN          1x 10GE XFP
  QXM 0          REV 06   711-028408   CABC5614         MPC QXM
  QXM 1          REV 06   711-028408   CABC5550         MPC QXM
FPC 9            REV 39   750-044130   ABCK1652         MPC6E 3D
  CPU            REV 09   711-045719   ABCK1655         RMPC PMB
```



```
  MIC 0          REV 09   750-049457   ABCP1230         2X100GE CFP2 OTN
    PIC 0                 BUILTIN      BUILTIN          2X100GE CFP2 OTN
      Xcvr 0              NON-JNPR     37300222WP0002   CFP2-100G-LR4-D
      Xcvr 1              NON-JNPR     FD46F001Y        CFP2-100G-SR10
  MIC 1          REV 07   750-049457   ABCV6662         2X100GE CFP2 OTN
    PIC 1                 BUILTIN      BUILTIN          2X100GE CFP2 OTN
      Xcvr 0              NON-JNPR     UQD0014          CFP2-100G-LR4-D
      Xcvr 1              NON-JNPR     J13J68335        CFP2-100G-LR4-D
  XLM 0          REV 07.2.00 711-046638 ABCK5491        MPC6E XL
  XLM 1          REV 07.2.00 711-046638 ABCK5475        MPC6E XL
ADC 1            REV 17   750-043596   ABCG9023         Adapter Card
ADC 2            REV 01   750-043596   ZV4079           Adapter Card
ADC 6            REV 17   750-043596   ABCG8866         Adapter Card
ADC 8            REV 17   750-043596   ABCA8993         Adapter Card
Fan Tray 0       REV 06   760-046960   ACAY0354         172mm FanTray - 6 Fans
Fan Tray 1       REV 06   760-046960   ACAY0831         172mm FanTray - 6 Fans
Fan Tray 2       REV 06   760-046960   ACAY0892         172mm FanTray - 6 Fans
Fan Tray 3       REV 06   760-046960   ACAY0839         172mm FanTray - 6 Fans
```

show chassis hardware detail (MX2010 Routers with MPC6E and OTN MIC)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN11C9AFEAFK     MX2010
Midplane         REV 35   750-044636   ABAB9188         Lower Backplane
Midplane 1       REV 02   711-044557   ABAB8729         Upper Backplane
PMP              REV 04   711-032426   ACAJ2432         Power Midplane
FPM Board        REV 09   760-044634   ABCA4314         Front Panel Display
PSM 0            REV 01   740-050037   1EDB321015C      DC 52V Power Supply
Module
PSM 1            REV 01   740-050037   1EDB321015J      DC 52V Power Supply
Module
PSM 2            REV 01   740-050037   1EDB32000K8      DC 52V Power Supply
Module
PSM 3            REV 01   740-050037   1EDB32101JW      DC 52V Power Supply
Module
PSM 4            REV 01   740-050037   1EDB321015G      DC 52V Power Supply
Module
PSM 5            REV 01   740-050037   1EDB32101HH      DC 52V Power Supply
Module
PSM 6            REV 01   740-050037   1EDB32101HD      DC 52V Power Supply
Module
PSM 7            REV 01   740-050037   1EDB321015F      DC 52V Power Supply
Module
PSM 8            REV 01   740-050037   1EDB321015B      DC 52V Power Supply
Module
PDM 0            REV 03   740-045234   1EFA3220433      DC Power Dist Module
PDM 1            REV 03   740-045234   1EFA3220425      DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009115685       RE-S-1800x4
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200274310822 191 Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000043190      Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel            uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087    uhub1
  DIMM 0         VL31B5263F-F8SD DIE REV-0 PCB REV-0    MFR ID-ce80
  DIMM 1         VL31B5263F-F8SD DIE REV-0 PCB REV-0    MFR ID-ce80
  DIMM 2         VL31B5263F-F8SD DIE REV-0 PCB REV-0    MFR ID-ce80
  DIMM 3         VL31B5263F-F8SD DIE REV-0 PCB REV-0    MFR ID-ce80
Routing Engine 1 REV 02   740-041821   9009099711       RE-S-1800x4
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200262860208 30 Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000146 Disk 1
```

```
CB 0             REV 23   750-040257   CABE8395         Control Board
CB 1             REV 12   750-040257   CAAD9499         Control Board
SPMB 0           REV 02   711-041855   ABCG8426         PMB Board
SPMB 1           REV 02   711-041855   ABBS1481         PMB Board
SFB 0            REV 06   711-044466   ABCD5013         Switch Fabric Board
SFB 1            REV 06   711-044466   ABCD5160         Switch Fabric Board
SFB 2            REV 06   711-044466   ABCD5175         Switch Fabric Board
SFB 3            REV 06   711-044466   ABCD4938         Switch Fabric Board
SFB 4            REV 06   711-044466   ABCD4944         Switch Fabric Board
SFB 5            REV 06   711-044466   ABCD4968         Switch Fabric Board
SFB 6            REV 06   711-044466   ABCD5267         Switch Fabric Board
SFB 7            REV 06   711-044466   ABCD4997         Switch Fabric Board
FPC 0            REV 59   750-044130   ABCT7676         MPC6E 3D
  CPU            REV 10   711-045719   ABCK8527         RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7810         MPC6E XL
  XLM 1          REV 13   711-046638   ABCT7811         MPC6E XL
FPC 2            REV 27   750-033205   ZL6014           MPCE Type 3 3D
  CPU            REV 07   711-035209   ZK9068           HMPC PMB 2G
  MIC 0          REV 14   750-033196   CAAW9214         1X100GE CXP
    PIC 0                 BUILTIN      BUILTIN          1X100GE CXP
      Xcvr 0     REV 01   740-046563   XC49FC030        CFP2-100G-SR10
  MIC 1          REV 18   750-033199   CAAC3231         1X100GE CFP
    PIC 2                 BUILTIN      BUILTIN          1X100GE CFP
FPC 3            REV 59   750-044130   ABCT7682         MPC6E 3D
  CPU            REV 10   711-045719   ABCK8531         RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7818         MPC6E XL
 XLM 1          REV 13   711-046638   ABCT7819         MPC6E XL
FPC 4            REV 33   750-044130   ABBY9278         MPC6E 3D
  CPU            REV 09   711-045719   ABBY8677         RMPC PMB
  XLM 0          REV 06.2.00 711-046638 ABBY8844        MPC6E XL
  XLM 1          REV 06.2.00 711-046638 ABBY8830        MPC6E XL
FPC 5            REV 59   750-044130   ABCT7675         MPC6E 3D
  CPU            REV 10   711-045719   ABCK8526         RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7808         MPC6E XL
  XLM 1          REV 13   711-046638   ABCT7809         MPC6E XL
FPC 6            REV 30   750-028467   ZM4986           MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ZP6541           AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43GAC          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   ALM0A6D          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AQF0RB3          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   153363A00333     SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AN10KYE          SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   APK04YM          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AQF0H44          SFP+-10G-SR
FPC 8            REV 38   750-031090   CABF7313         MPC Type 2 3D EQ
  CPU            REV 08   711-030884   CABE6727         MPC PMB 2G
  MIC 0          REV 18   750-028380   YK8253           3D 2x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN          1x 10GE XFP
      Xcvr 0     REV 03   740-014289   AD1148M00TP      XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN          1x 10GE XFP
  QXM 0          REV 06   711-028408   CABC5614         MPC QXM
  QXM 1          REV 06   711-028408   CABC5550         MPC QXM
FPC 9            REV 39   750-044130   ABCK1652         MPC6E 3D
  CPU            REV 09   711-045719   ABCK1655         RMPC PMB
  MIC 0          REV 09   750-049457   ABCP1230         2X100GE CFP2 OTN
    PIC 0                 BUILTIN      BUILTIN          2X100GE CFP2 OTN
      Xcvr 0              NON-JNPR     37300222WP0002   CFP2-100G-LR4-D
```

```
      Xcvr 1            NON-JNPR     FD46F001Y        CFP2-100G-SR10
  MIC 1        REV 07   750-049457   ABCV6662         2X100GE CFP2 OTN
    PIC 1               BUILTIN      BUILTIN          2X100GE CFP2 OTN
      Xcvr 0            NON-JNPR     UQD0014          CFP2-100G-LR4-D
      Xcvr 1            NON-JNPR     J13J68335        CFP2-100G-LR4-D
  XLM 0        REV 07.2.00 711-046638 ABCK5491        MPC6E XL
  XLM 1        REV 07.2.00 711-046638 ABCK5475        MPC6E XL
ADC 1          REV 17   750-043596   ABCG9023         Adapter Card
ADC 2          REV 01   750-043596   ZV4079           Adapter Card
ADC 6          REV 17   750-043596   ABCG8866         Adapter Card
ADC 8          REV 17   750-043596   ABCA8993         Adapter Card
Fan Tray 0     REV 06   760-046960   ACAY0354         172mm FanTray - 6 Fans
Fan Tray 1     REV 06   760-046960   ACAY0831         172mm FanTray - 6 Fans
Fan Tray 2     REV 06   760-046960   ACAY0892         172mm FanTray - 6 Fans
Fan Tray 3     REV 06   760-046960   ACAY0839         172mm FanTray - 6 Fans
```

show chassis hardware extensive (MX2010 Routers with MPC6E and OTN MIC)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item           Version  Part number  Serial number    Description
Chassis                              JN11C9AFEAFK     MX2010
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
                                S/N:               JN11C9AFEAFK
 Assembly ID:  0x0557           Assembly Version:  00.00
 Date:         00-00-0000       Assembly Flags:    0x00
 ID: MX2010
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 43 39 41 46 45 41 46 4b 00 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane        REV 35   750-044636   ABAB9188         Lower Backplane
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          750-044636       S/N:               ABAB9188
 Assembly ID:  0x0b66           Assembly Version:  01.35
 Date:         06-21-2013       Assembly Flags:    0x00
 Version:      REV 35           CLEI Code:         IPMU810ARA
 ID: Lower Backplane            FRU Model Number:  CHAS-BP-MX2010-S
 Board Information Record:
  Address 0x00: ad 01 08 00 3c 8a b0 38 68 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 66 01 23 52 45 56 20 33 35 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 36 33 36 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 39 31 38 38 00 15 06 07
  Address 0x30: dd ff ff ff ad 01 08 00 3c 8a b0 38 68 00 ff ff
  Address 0x40: ff ff ff ff 01 49 50 4d 55 38 31 30 41 52 41 43
  Address 0x50: 48 41 53 2d 42 50 2d 4d 58 32 30 31 30 2d 53 00
  Address 0x60: 00 00 00 00 00 00 30 36 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff f8 ff ff ff ff ff ff ff ff ff ff ff ff
Midplane 1      REV 02   711-044557   ABAB8729         Upper Backplane
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          711-044557       S/N:               ABAB8729
 Assembly ID:  0x0b65           Assembly Version:  01.02
 Date:         03-21-2013       Assembly Flags:    0x00
```

```
  Version:      REV 02
  ID: Upper Backplane
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 01 ff 0b 65 01 02 52 45 56 20 30 32 00 00
   Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 35 35 37 00 00
   Address 0x20: 53 2f 4e 20 41 42 41 42 38 37 32 39 00 15 03 07
   Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
   Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
   Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP              REV 04   711-032426   ACAJ2432          Power Midplane
  Jedec Code:   0x7fb0            EEPROM Version:    0x01
  P/N:          711-032426        S/N:               ACAJ2432
  Assembly ID:  0x045d            Assembly Version:  01.04
  Date:         03-28-2013        Assembly Flags:    0x00
  Version:      REV 04
  ID: Power Midplane
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
   Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
   Address 0x20: 53 2f 4e 20 41 43 41 4a 32 34 33 32 00 1c 03 07
   Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
   Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
   Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 09   760-044634   ABCA4314          Front Panel Display
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          760-044634        S/N:               ABCA4314
  Assembly ID:  0x0b64            Assembly Version:  01.09
  Date:         03-28-2013        Assembly Flags:    0x00
  Version:      REV 09            CLEI Code:         IPMYA4EJRA
  ID: Front Panel Display         FRU Model Number:  MX2010-CRAFT-S
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 0b 64 01 09 52 45 56 20 30 39 00 00
   Address 0x10: 00 00 00 00 37 36 30 2d 30 34 34 36 33 34 00 00
   Address 0x20: 53 2f 4e 20 41 42 43 41 34 33 31 34 00 1c 03 07
   Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 49 50 4d 59 41 34 45 4a 52 41 4d
   Address 0x50: 58 32 30 31 30 2d 43 52 41 46 54 2d 53 00 00 00
   Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 93 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0            REV 01   740-050037   1EDB321015C       DC 52V Power Supply
Module
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          740-050037        S/N:               1EDB321015C
  Assembly ID:  0x0478            Assembly Version:  01.01
  Date:         05-28-2013        Assembly Flags:    0x00
  Version:      REV 01            CLEI Code:         IPUPAKRKAA
  ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
```

```
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 43 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1            REV 01   740-050037   1EDB321015J      DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB321015J
Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         05-28-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 4a 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 2            REV 01   740-050037   1EDB32000K8      DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB32000K8
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         05-23-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 30 30 30 4b 38 00 00 17 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 3            REV 01   740-050037   1EDB32101JW      DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB32101JW
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         05-30-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 4a 57 00 00 1e 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
```

```
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 4            REV 01   740-050037   1EDB321015G       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB321015G
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-28-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 47 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 5            REV 01   740-050037   1EDB32101HH       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB32101HH
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-30-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 48 48 00 00 1e 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 6            REV 01   740-050037   1EDB32101HD       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB32101HD
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-30-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 48 44 00 00 1e 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 7            REV 01   740-050037   1EDB321015F       DC 52V Power Supply
```



```
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB321015F
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         05-28-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 46 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 8            REV 01   740-050037   1EDB321015B       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB321015B
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         05-28-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 42 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PDM 0            REV 03   740-045234   1EFA3220433       DC Power Dist Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-045234       S/N:               1EFA3220433
 Assembly ID:  0x047b           Assembly Version:  01.03
 Date:         05-30-2013       Assembly Flags:    0x00
 Version:      REV 03           CLEI Code:         IPUPAJSKAA
 ID: DC Power Dist Module        FRU Model Number:  MX2000-PDM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 7b 01 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 32 33 34 00 00
  Address 0x20: 31 45 46 41 33 32 32 30 34 33 33 00 00 1e 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4a 53 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 44 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 33 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 1d 00 00 00 00 00 00 00 00 00 00 00 00
PDM 1            REV 03   740-045234   1EFA3220425       DC Power Dist Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-045234       S/N:               1EFA3220425
 Assembly ID:  0x047b           Assembly Version:  01.03
 Date:         05-30-2013       Assembly Flags:    0x00
 Version:      REV 03           CLEI Code:         IPUPAJSKAA
```

```
 ID: DC Power Dist Module        FRU Model Number:  MX2000-PDM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
..
```

show chassis hardware (MX2020 Router)

```
user@host > show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11E2227AFJ      MX2020
Midplane         REV 27   750-040240   ABAB9384          Lower Power Midplane
Midplane 1       REV 04   711-032386   ABAB9386          Upper Backplane
PMP 1            REV 05   711-032428   ACAJ1579          Upper Power Midplane
PMP 0            REV 04   711-032426   ACAJ1524          Lower Power Midplane
FPM Board        REV 06   760-040242   ABBT8837          Front Panel Display
PSM 0            REV 01   740-045050   1E022240056       DC 52V Power Supply
Module
PSM 1            REV 01   740-045050   1E022240054       DC 52V Power Supply
Module
PSM 2            REV 01   740-045050   1E02224005H       DC 52V Power Supply
Module
PSM 3            REV 01   740-045050   1E022240053       DC 52V Power Supply
Module
PSM 4            REV 01   740-045050   1E02224004K       DC 52V Power Supply
Module
PSM 7            REV 01   740-045050   1E02224006W       DC 52V Power Supply
Module
PSM 8            REV 01   740-045050   1E022240062       DC 52V Power Supply
Module
PSM 9            REV 01   740-045050   1E02224005B       DC 52V Power Supply
Module
PSM 10           REV 01   740-045050   1E02224005A       DC 52V Power Supply
Module
PSM 11           REV 01   740-045050   1E022240052       DC 52V Power Supply
Module
PSM 12           REV 01   740-045050   1E022240051       DC 52V Power Supply
Module
PSM 13           REV 01   740-045050   1E022240058       DC 52V Power Supply
Module
PSM 14           REV 01   740-045050   1E02224004L       DC 52V Power Supply
Module
PSM 15           REV 01   740-045050   1E02224005M       DC 52V Power Supply
Module
PSM 16           REV 01   740-045050   1E02224006S       DC 52V Power Supply
Module
PSM 17           REV 01   740-045050   1E02224005Z       DC 52V Power Supply
Module
PDM 0            REV 01   740-045234   1E012150033       DC Power Dist Module
PDM 1            REV 01   740-045234   1E012150027       DC Power Dist Module
PDM 2            REV 01   740-045234   1E012150028       DC Power Dist Module
PDM 3            REV 01   740-045234   1E012150045       DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009089704        RE-S-1800x4
Routing Engine 1 REV 02   740-041821   9009094138        RE-S-1800x4
CB 0             REV 14   750-040257   CAAF8430          Control Board
CB 1             REV 08   750-040257   CAAB3482          Control Board
SPMB 0           REV 01   711-041855   ZS2290            PMB Board
SPMB 1           REV 02   711-041855   CAAA6141          PMB Board
SFB 0            REV 03   711-044466   ABBV6789          Switch Fabric Board
SFB 1            REV 05   711-044466   ABBX5666          Switch Fabric Board
SFB 2            REV 05   711-044466   ABBX5678          Switch Fabric Board
```



```
SFB 3            REV 05   711-044466   ABBX5687          Switch Fabric Board
SFB 4            REV 05   711-044466   ABBX5609          Switch Fabric Board
SFB 5            REV 05   711-044466   ABBX5675          Switch Fabric Board
SFB 6            REV 03   711-044466   ABBV6805          Switch Fabric Board
SFB 7            REV 05   711-044466   ABBX5701          Switch Fabric Board
FPC 0            REV 30   750-028467   ABBN0284          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN0507          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00990         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E04357         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01327         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E04375         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02760         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02904         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E03963         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E00756         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04418         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01077         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01128         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01253         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E01140         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11F01626         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01075         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E01177         SFP+-10G-USR
FPC 1            REV 30   750-028467   ABBN0208          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ1084          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04745         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11F01570         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E04388         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01439         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04739         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11F01869         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01675         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01901         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01346         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11F01288         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01824         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E04312         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02811         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E03847         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01495         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01265         SFP+-10G-USR
FPC 2            REV 30   750-028467   ZM5111            MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ZP6607            AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LJA           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MFZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NKL           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80KF4           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80FBJ           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MM2           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LJV           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NXV           SFP+-10G-SR
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  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80N1H           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80NLS           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80FL5           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NL9           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80NG2           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80KDU           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80MG1           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80MM0           SFP+-10G-SR
FPC 3            REV 30   750-028467   ABBN0302          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN0495          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01581         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01176         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01251         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E02752         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00786         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01020         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01023         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E02819         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02812         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11D04437         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01279         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01333         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00978         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01018         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01784         SFP+-10G-USR
    Xcvr 3       REV 01   740-031980   AK80NKP           SFP+-10G-SR
FPC 4            REV 30   750-028467   ABBN0308          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ1095          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04305         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01147         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01195         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01743         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01892         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02880         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E00725         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E01057         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02816         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11C04501         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E02764         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E00789         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01250         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02847         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E00787         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E03803         SFP+-10G-USR
FPC 5            REV 30   750-028467   ABBN0316          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ1082          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00523         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K01848         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01865         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00540         SFP+-10G-SR
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  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00422         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00428         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K00423         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K01855         SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K01847         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00526         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K00529         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00525         SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00425         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00530         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01851         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00528         SFP+-10G-SR
FPC 6            REV 32   750-028467   ABBN6832          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBK6534          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80MB4           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80FQ6           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80N1F           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NLQ           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80KDR           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80FGJ           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80N5G           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80KD8           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LET           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80N1X           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NRF           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NL2           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80N3D           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MRB           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LEQ           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80LER           SFP+-10G-SR
FPC 7            REV 32   750-028467   ABBN6811          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN7288          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80NK8           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80LJG           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LBU           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80N21           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LEU           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80NLM           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NL6           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80LES           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LEN           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80ME0           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LMG           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80MM1           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80MG7           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80KF9           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NRQ           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NLE           SFP+-10G-SR
FPC 8            REV 23   750-028467   YN2977            MPC 3D 16x 10GE
  CPU            REV 10   711-029089   YP1856            AMPC PMB
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  PIC 0                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-031980   183363A00875      SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   183363A00851      SFP+-10G-SR
    Xcvr 2     REV 01   740-031980   183363A00772      SFP+-10G-SR
    Xcvr 3     REV 01   740-031980   183363A00882      SFP+-10G-SR
  PIC 1                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-031980   183363A00735      SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   183363A00169      SFP+-10G-SR
    Xcvr 2     REV 01   740-031980   183363A00726      SFP+-10G-SR
    Xcvr 3     REV 01   740-031980   183363A00077      SFP+-10G-SR
  PIC 2                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-031980   183363A00168      SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   183363A00676      SFP+-10G-SR
    Xcvr 2     REV 01   740-031980   183363A00732      SFP+-10G-SR
    Xcvr 3     REV 01   740-031980   183363A00091      SFP+-10G-SR
  PIC 3                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-031980   183363A00725      SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   183363A00642      SFP+-10G-SR
    Xcvr 2     REV 01   740-031980   183363A00871      SFP+-10G-SR
    Xcvr 3     REV 01   740-031980   183363A00853      SFP+-10G-SR
FPC 9          REV 32   750-028467   ABBN6798          MPC 3D 16x 10GE
  CPU          REV 10   711-029089   ABBK6556          AMPC PMB
  PIC 0                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-021308   9ZDZ06A00055      SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   183363A00239      SFP+-10G-SR
    Xcvr 2     REV 01   740-021308   AD0915E003K       SFP+-10G-SR
    Xcvr 3     REV 01   740-021308   AD0915E003A       SFP+-10G-SR
  PIC 1                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-031980   AK80MRC           SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   AK80NL5           SFP+-10G-SR
    Xcvr 2     REV 01   740-031980   AK80NKN           SFP+-10G-SR
    Xcvr 3     REV 01   740-031980   AK80N3U           SFP+-10G-SR
  PIC 2                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-031980   AK80N1T           SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   AJ808DJ           SFP+-10G-SR
    Xcvr 2     REV 01   740-031980   AK80NG4           SFP+-10G-SR
    Xcvr 3     REV 01   740-031980   AK80FND           SFP+-10G-SR
  PIC 3                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-031980   AK80FKQ           SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   AK80NLT           SFP+-10G-SR
    Xcvr 2     REV 01   740-031980   AK80NKR           SFP+-10G-SR
    Xcvr 3     REV 01   740-031980   AK80LKM           SFP+-10G-SR
FPC 10         REV 32   750-028467   ABBN6813          MPC 3D 16x 10GE
  CPU          REV 10   711-029089   ABBK6542          AMPC PMB
  PIC 0                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-031980   AK80NA3           SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   AK80NLF           SFP+-10G-SR
    Xcvr 2     REV 01   740-031980   AK80MRH           SFP+-10G-SR
    Xcvr 3     REV 01   740-031980   AK80KE4           SFP+-10G-SR
  PIC 1                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-021308   973152A00030      SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   AK80L9H           SFP+-10G-SR
    Xcvr 2     REV 01   740-031980   AK80ME8           SFP+-10G-SR
    Xcvr 3     REV 01   740-031980   AK80NLR           SFP+-10G-SR
  PIC 2                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-031980   AK80NG1           SFP+-10G-SR
    Xcvr 1     REV 01   740-031980   AK80MCA           SFP+-10G-SR
    Xcvr 2     REV 01   740-031980   AK80LFC           SFP+-10G-SR
    Xcvr 3     REV 01   740-031980   AK80LEM           SFP+-10G-SR
  PIC 3                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0     REV 01   740-031980   AK80N9X           SFP+-10G-SR
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      Xcvr 1        REV 01   740-031980   AK80LAC           SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80LF2           SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80N8T           SFP+-10G-SR
  FPC 11            REV 30   750-028467   ABBN0281          MPC 3D 16x 10GE
    CPU             REV 10   711-029089   ABBN0526          AMPC PMB
    PIC 0                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-030658   B11F01326         SFP+-10G-USR
      Xcvr 1        REV 01   740-030658   B11E03973         SFP+-10G-USR
      Xcvr 2        REV 01   740-030658   B11E00950         SFP+-10G-USR
      Xcvr 3        REV 01   740-030658   B11E00674         SFP+-10G-USR
    PIC 1                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-030658   B11E00775         SFP+-10G-USR
      Xcvr 1        REV 01   740-030658   B11E04461         SFP+-10G-USR
      Xcvr 2        REV 01   740-030658   B11E01074         SFP+-10G-USR
      Xcvr 3        REV 01   740-030658   B11E02821         SFP+-10G-USR
    PIC 2                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-030658   B11E04501         SFP+-10G-USR
      Xcvr 1        REV 01   740-030658   B11E00757         SFP+-10G-USR
      Xcvr 2        REV 01   740-030658   B11F01623         SFP+-10G-USR
      Xcvr 3        REV 01   740-030658   B11E01022         SFP+-10G-USR
    PIC 3                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-030658   B11E04359         SFP+-10G-USR
      Xcvr 1        REV 01   740-030658   B11E02751         SFP+-10G-USR
      Xcvr 2        REV 01   740-030658   B11E02736         SFP+-10G-USR
      Xcvr 3        REV 01   740-030658   B11E01178         SFP+-10G-USR
  FPC 12            REV 32   750-028467   ABBN6796          MPC 3D 16x 10GE
    CPU             REV 10   711-029089   ABBN7259          AMPC PMB
    PIC 0                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   B11K01856         SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   B11K01853         SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   B11K01863         SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   163363A02863      SFP+-10G-SR
    PIC 1                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   163363A02668      SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   163363A02881      SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   163363A01671      SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   163363A02627      SFP+-10G-SR
    PIC 2                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   163363A02725      SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   163363A02692      SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   163363A02730      SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   163363A03081      SFP+-10G-SR
    PIC 3                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   163363A02736      SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   163363A02568      SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   163363A02747      SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   163363A02579      SFP+-10G-SR
  FPC 13            REV 30   750-028467   ABBN0270          MPC 3D 16x 10GE
    CPU             REV 10   711-029089   ABBJ0966          AMPC PMB
    PIC 0                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80NL1           SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80NXW           SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80KD2           SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80FMD           SFP+-10G-SR
    PIC 1                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80NKQ           SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80MGH           SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80N38           SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80NL7           SFP+-10G-SR
    PIC 2                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80LEL           SFP+-10G-SR
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      Xcvr 1        REV 01   740-031980   AK80NKD          SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80KCY          SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80LHK          SFP+-10G-SR
    PIC 3                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80M5J          SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80MBE          SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80NLG          SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80LFH          SFP+-10G-SR
  FPC 14            REV 32   750-028467   ABBN6790         MPC 3D 16x 10GE
    CPU             REV 10   711-029089   ABBK6515         AMPC PMB
    PIC 0                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80LZM          SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80MCC          SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80KCM          SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80KE0          SFP+-10G-SR
    PIC 1                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-021310   C10F99155        SFP+-10G-LRM
      Xcvr 1        REV 01   740-021310   C10F99049        SFP+-10G-LRM
      Xcvr 2        REV 01   740-021310   C10F99128        SFP+-10G-LRM
      Xcvr 3        REV 01   740-021310   C10F99169        SFP+-10G-LRM
    PIC 2                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80LF3          SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   163363A02597     SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   163363A03060     SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   163363A03057     SFP+-10G-SR
    PIC 3                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80LEX          SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80FEU          SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80FNM          SFP+-10G-SR
      Xcvr 3        REV 01   740-021308   AJQ0Q5G          SFP+-10G-SR
  FPC 15            REV 32   750-028467   ABBN6791         MPC 3D 16x 10GE
    CPU             REV 10   711-029089   ABBN7289         AMPC PMB
    PIC 0                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   B11K00424        SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   B11K01849        SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   B11K01862        SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   B11K01852        SFP+-10G-SR
    PIC 1                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   B11K00427        SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   B11K00430        SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   B11K01854        SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   B11K00426        SFP+-10G-SR
    PIC 2                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   B11K00429        SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   B11K01864        SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   B11K01850        SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   B11K00522        SFP+-10G-SR
    PIC 3                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-030658   B11E01144        SFP+-10G-USR
      Xcvr 1        REV 01   740-030658   B11E00985        SFP+-10G-USR
      Xcvr 2        REV 01   740-030658   B11E00796        SFP+-10G-USR
      Xcvr 3        REV 01   740-031980   B11K01866        SFP+-10G-SR
  FPC 16            REV 30   750-028467   ABBM4592         MPC 3D 16x 10GE
    CPU             REV 10   711-029089   ABBN0465         AMPC PMB
    PIC 0                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-030658   B11F01435        SFP+-10G-USR
      Xcvr 1        REV 01   740-030658   B11E01052        SFP+-10G-USR
      Xcvr 2        REV 01   740-030658   B11F01328        SFP+-10G-USR
      Xcvr 3        REV 01   740-030658   B11F01254        SFP+-10G-USR
    PIC 1                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-030658   B11E02738        SFP+-10G-USR
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      Xcvr 1      REV 01   740-030658   B11E02881         SFP+-10G-USR
      Xcvr 2      REV 01   740-030658   B11F01624         SFP+-10G-USR
      Xcvr 3      REV 01   740-030658   B11E00889         SFP+-10G-USR
    PIC 2                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-030658   B11E02883         SFP+-10G-USR
      Xcvr 1      REV 01   740-030658   B11E00681         SFP+-10G-USR
      Xcvr 2      REV 01   740-030658   B11E04306         SFP+-10G-USR
      Xcvr 3      REV 01   740-030658   B11E02813         SFP+-10G-USR
    PIC 3                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-030658   B11F01801         SFP+-10G-USR
      Xcvr 1      REV 01   740-030658   B11E02753         SFP+-10G-USR
      Xcvr 2      REV 01   740-030658   B11E01156         SFP+-10G-USR
      Xcvr 3      REV 01   740-030658   B11E04324         SFP+-10G-USR
  FPC 17          REV 32   750-028467   ABBN6810          MPC 3D 16x 10GE
    CPU           REV 10   711-029089   ABBN7237          AMPC PMB
    PIC 0                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02638      SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02082      SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A01674      SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A03058      SFP+-10G-SR
    PIC 1                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A03048      SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02729      SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A02566      SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A02567      SFP+-10G-SR
    PIC 2                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02878      SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02739      SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A01959      SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A02660      SFP+-10G-SR
    PIC 3                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02731      SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02588      SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A02673      SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A02654      SFP+-10G-SR
  FPC 18          REV 30   750-028467   ABBM4739          MPC 3D 16x 10GE
    CPU           REV 10   711-029089   ABBN0487          AMPC PMB
    PIC 0                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02569      SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02886      SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A03082      SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   133363A00297      SFP+-10G-SR
    PIC 1                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02726      SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A03050      SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A02884      SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A03076      SFP+-10G-SR
    PIC 2                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02581      SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02873      SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A02582      SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A03083      SFP+-10G-SR
    PIC 3                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031981   UL70BU6           SFP+-10G-LR
      Xcvr 1      REV 01   740-031981   UL50QC6           SFP+-10G-LR
      Xcvr 2      REV 01   740-031981   UL708N6           SFP+-10G-LR
      Xcvr 3      REV 01   740-031981   UL603KK           SFP+-10G-LR
  FPC 19          REV 32   750-028467   ABBN6827          MPC 3D 16x 10GE
    CPU           REV 10   711-029089   ABBK6508          AMPC PMB
    PIC 0                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A01688      SFP+-10G-SR
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     Xcvr 1        REV 01    740-031980   163363A01724      SFP+-10G-SR
     Xcvr 2        REV 01    740-031980   163363A01773      SFP+-10G-SR
     Xcvr 3        REV 01    740-031980   163363A02593      SFP+-10G-SR
   PIC 1                     BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
     Xcvr 0        REV 01    740-031980   163363A03061      SFP+-10G-SR
     Xcvr 1        REV 01    740-031980   163363A03056      SFP+-10G-SR
     Xcvr 2        REV 01    740-031980   163363A02669      SFP+-10G-SR
     Xcvr 3        REV 01    740-031980   163363A03070      SFP+-10G-SR
   PIC 2                     BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
     Xcvr 0        REV 01    740-031980   163363A02572      SFP+-10G-SR
     Xcvr 1        REV 01    740-031980   163363A02697      SFP+-10G-SR
     Xcvr 2        REV 01    740-031980   163363A02585      SFP+-10G-SR
     Xcvr 3        REV 01    740-031980   163363A03052      SFP+-10G-SR
   PIC 3                     BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
     Xcvr 0        REV 01    740-031980   163363A02591      SFP+-10G-SR
     Xcvr 1        REV 01    740-031980   163363A02649      SFP+-10G-SR
     Xcvr 2        REV 01    740-031980   163363A02577      SFP+-10G-SR
     Xcvr 3        REV 01    740-031980   163363A02698      SFP+-10G-SR
ADC 0              REV 13    750-043596   ABBX5561          Adapter Card
ADC 1              REV 13    750-043596   ABBX5546          Adapter Card
ADC 2              REV 13    750-043596   ABBX5535          Adapter Card
ADC 3              REV 13    750-043596   ABBX5552          Adapter Card
ADC 4              REV 13    750-043596   ABBX5581          Adapter Card
ADC 5              REV 13    750-043596   ABBX5545          Adapter Card
ADC 6              REV 13    750-043596   ABBX5554          Adapter Card
ADC 7              REV 07    750-043596   ABBV7194          Adapter Card
ADC 8              REV 07    750-043596   ABBV7251          Adapter Card
ADC 9              REV 07    750-043596   ABBV7202          Adapter Card
ADC 10             REV 13    750-043596   ABBX5538          Adapter Card
ADC 11             REV 13    750-043596   ABBX5566          Adapter Card
ADC 12             REV 13    750-043596   ABBX5542          Adapter Card
ADC 13             REV 13    750-043596   ABBX5539          Adapter Card
ADC 14             REV 13    750-043596   ABBX5555          Adapter Card
ADC 15             REV 13    750-043596   ABBX5557          Adapter Card
ADC 16             REV 13    750-043596   ABBX5536          Adapter Card
ADC 17             REV 13    750-043596   ABBX5559          Adapter Card
ADC 18             REV 13    750-043596   ABBX5537          Adapter Card
ADC 19             REV 11    750-043596   ABBW5685          Adapter Card
Fan Tray 0         REV 2A    760-046960   ACAY0030          172mm FanTray - 6 Fans
Fan Tray 1         REV 2A    760-046960   ACAY0039          172mm FanTray - 6 Fans
Fan Tray 2         REV 2A    760-046960   ACAY0033          172mm FanTray - 6 Fans
Fan Tray 3         REV 2A    760-046960   ACAY0062          172mm FanTray - 6 Fans
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show chassis hardware detail (MX2020 Router)

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user@host> show chassis hardware detail
Hardware inventory:
Item               Version   Part number  Serial number     Description
Chassis                                   JN11E2227AFJ      MX2020
Midplane           REV 27    750-040240   ABAB9384          Lower Power Midplane
Midplane 1         REV 04    711-032386   ABAB9386          Upper Backplane
PMP 1              REV 05    711-032428   ACAJ1821          Upper Power Midplane
PMP 0              REV 04    711-032426   ACAJ1524          Lower Power Midplane
FPM Board          REV 06    760-040242   ABBT8837          Front Panel Display
PSM 0              REV 01    740-045050   1E02224006G       DC 52V Power Supply
Module
PSM 1              REV 01    740-045050   1E022240053       DC 52V Power Supply
Module
PSM 2              REV 01    740-045050   1E02224004K       DC 52V Power Supply
Module
PSM 3              REV 01    740-045050   1E022240056       DC 52V Power Supply
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Module
PSM 4            REV 01   740-045050   1E022240054       DC 52V Power Supply
Module
PSM 5            REV 01   740-045050   1E02224005H       DC 52V Power Supply
Module
PSM 6            REV 01   740-045050   1E02224006S       DC 52V Power Supply
Module
PSM 7            REV 01   740-045050   1E02224005M       DC 52V Power Supply
Module
PSM 8            REV 01   740-045050   1E022240062       DC 52V Power Supply
Module
PSM 9            REV 03   740-045050   1EDB2350095       DC 52V Power Supply
Module
PSM 10           REV 03   740-045050   1EDB235009L       DC 52V Power Supply
Module
PSM 11           REV 03   740-045050   1EDB2350092       DC 52V Power Supply
Module
PSM 12           REV 03   740-045050   1EDB23500AT       DC 52V Power Supply
Module
PSM 13           REV 03   740-045050   1EDB2350094       DC 52V Power Supply
Module
PSM 15           REV 03   740-045050   1EDB235008X       DC 52V Power Supply
Module
PDM 0            REV 01   740-045234   1E012150033       DC Power Dist Module
PDM 1            REV 01   740-045234   1E012150027       DC Power Dist Module
PDM 2            REV 01   740-045234   1E262250072       DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009094138        RE-S-1800x4
  ad0    3998 MB  Virtium - TuffDisk VCF3 20110825A021D0000064 Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000347 Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02   740-041821   9009089709        RE-S-1800x4
  ad0    3831 MB  UGB30SFA4000T1       SFA4000T1 00000113 Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-478612-001044 Disk 1
CB 0             REV 08   750-040257   CAAB3482          Control Board
CB 1             REV 04   750-040257   ZT2864            Control Board
SPMB 0           REV 02   711-041855   CAAA6141          PMB Board
SPMB 1           REV 01   711-041855   ZS2275            PMB Board
SFB 0            REV 05   711-044466   ABBT2161          Switch Fabric Board
SFB 1            REV 05   711-044466   ABBT2159          Switch Fabric Board
SFB 2            REV 05   711-044466   ABBX3718          Switch Fabric Board
SFB 3            REV 05   711-044466   ABBT2152          Switch Fabric Board
SFB 4            REV 05   711-044466   ABBT2160          Switch Fabric Board
SFB 5            REV 05   711-044466   ABBT2145          Switch Fabric Board
SFB 6            REV 05   711-044466   ABBT2150          Switch Fabric Board
SFB 7            REV 05   711-044466   ABBT2163          Switch Fabric Board
FPC 0            REV 30   750-028467   ABBN0284          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN0507          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00990         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E04357         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01327         SFP+-10G-USR
Xcvr 3       REV 01   740-030658   B11E04375         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02760         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02904         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E03963         SFP+-10G-USR
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    Xcvr 3       REV 01   740-030658   B11E00756        SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04418        SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01077        SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01128        SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01253        SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E01140        SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11F01626        SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01075        SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E01177        SFP+-10G-USR
FPC 1            REV 30   750-028467   ABBN0308         MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ1095         AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04305        SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01147        SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01195        SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01743        SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01892        SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02880        SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E00725        SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E01057        SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02816        SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11C04501        SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E02764        SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E00789        SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01250        SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02847        SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E00787        SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E03803        SFP+-10G-USR
FPC 2            REV 30   750-028467   ABBN0316         MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ1082         AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00523        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K01848        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01865        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00540        SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00422        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00428        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K00423        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K01855        SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K01847        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00526        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K00529        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00525        SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
Xcvr 0       REV 01   740-031980   B11K00425        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00530        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01851        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00528        SFP+-10G-SR
FPC 3            REV 32   750-028467   ABBN6832         MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBK6534         AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80MB4          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80FQ6          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80N1F          SFP+-10G-SR
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    Xcvr 3       REV 01   740-031980   AK80NLQ          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80KDR          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80FGJ          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80N5G          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80KD8          SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LET          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80N1X          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NRF          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NL2          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80N3D          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MRB          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LEQ          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80LER          SFP+-10G-SR
FPC 4            REV 32   750-028467   ABBN6811         MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN7288         AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80NK8          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80LJG          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LBU          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80N21          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LEU          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80NLM          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NL6          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80LES          SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LEN          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80ME0          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LMG          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80MM1          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80MG7          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80KF9          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NRQ          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NLE          SFP+-10G-SR
FPC 5            REV 32   750-028467   ABBN6791         MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN7289         AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00424        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K01849        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01862        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K01852        SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP
Xcvr 0       REV 01   740-031980   B11K00427        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00430        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01854        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00426        SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00429        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K01864        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01850        SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00522        SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E01144        SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E00985        SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E00796        SFP+-10G-USR
    Xcvr 3       REV 01   740-031980   B11K01866        SFP+-10G-SR
FPC 6            REV 30   750-028467   ABBM4592         MPC 3D 16x 10GE
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  CPU           REV 10   711-029089   ABBN0465         AMPC PMB
  PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-030658   B11F01435        SFP+-10G-USR
    Xcvr 1      REV 01   740-030658   B11E01052        SFP+-10G-USR
    Xcvr 2      REV 01   740-030658   B11F01328        SFP+-10G-USR
    Xcvr 3      REV 01   740-030658   B11F01254        SFP+-10G-USR
  PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-030658   B11E02738        SFP+-10G-USR
    Xcvr 1      REV 01   740-030658   B11E02881        SFP+-10G-USR
    Xcvr 2      REV 01   740-030658   B11F01624        SFP+-10G-USR
    Xcvr 3      REV 01   740-030658   B11E00889        SFP+-10G-USR
  PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-030658   B11E02883        SFP+-10G-USR
    Xcvr 1      REV 01   740-030658   B11E00681        SFP+-10G-USR
    Xcvr 2      REV 01   740-030658   B11E04306        SFP+-10G-USR
    Xcvr 3      REV 01   740-030658   B11E02813        SFP+-10G-USR
  PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-030658   B11F01801        SFP+-10G-USR
    Xcvr 1      REV 01   740-030658   B11E02753        SFP+-10G-USR
    Xcvr 2      REV 01   740-030658   B11E01156        SFP+-10G-USR
    Xcvr 3      REV 01   740-030658   B11E04324        SFP+-10G-USR
FPC 7           REV 32   750-028467   ABBN6810         MPC 3D 16x 10GE
  CPU           REV 10   711-029089   ABBN7237         AMPC PMB
  PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   163363A03058     SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   163363A02082     SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   163363A01674     SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   163363A02638     SFP+-10G-SR
  PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   163363A03048     SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   163363A02729     SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   163363A02566     SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   163363A02567     SFP+-10G-SR
  PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   163363A02878     SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   163363A02739     SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   163363A01959     SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   163363A02660     SFP+-10G-SR
  PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   163363A02731     SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   163363A02588     SFP+-10G-SR
 Xcvr 2      REV 01   740-031980   163363A02673     SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   163363A02654     SFP+-10G-SR
FPC 8           REV 30   750-028467   ABBM4739         MPC 3D 16x 10GE
  CPU           REV 10   711-029089   ABBN0487         AMPC PMB
  PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   163363A02569     SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   163363A02886     SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   163363A03082     SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   133363A00297     SFP+-10G-SR
  PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   163363A02726     SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   163363A03050     SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   163363A02884     SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   163363A03076     SFP+-10G-SR
  PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   163363A02581     SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   163363A02873     SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   163363A02582     SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   163363A03083     SFP+-10G-SR
  PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
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      Xcvr 0      REV 01   740-031981   UL70BU6          SFP+-10G-LR
      Xcvr 1      REV 01   740-031981   UL50QC6          SFP+-10G-LR
      Xcvr 2      REV 01   740-031981   UL708N6          SFP+-10G-LR
      Xcvr 3      REV 01   740-031981   UL603KK          SFP+-10G-LR
  FPC 9           REV 32   750-028467   ABBN6827         MPC 3D 16x 10GE
    CPU           REV 10   711-029089   ABBK6508         AMPC PMB
    PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A01688     SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A01724     SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A01773     SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A02593     SFP+-10G-SR
    PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A03061     SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A03056     SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A02669     SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A03070     SFP+-10G-SR
    PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02572     SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02697     SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A02585     SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A03052     SFP+-10G-SR
    PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02591     SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02649     SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A02577     SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A02698     SFP+-10G-SR
  FPC 10          REV 30   750-028467   ABBN0302         MPC 3D 16x 10GE
    CPU           REV 10   711-029089   ABBN0495         AMPC PMB
    PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-030658   B11F01581        SFP+-10G-USR
      Xcvr 1      REV 01   740-030658   B11E01176        SFP+-10G-USR
      Xcvr 2      REV 01   740-030658   B11F01251        SFP+-10G-USR
      Xcvr 3      REV 01   740-030658   B11E02752        SFP+-10G-USR
    PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-030658   B11E00786        SFP+-10G-USR
      Xcvr 1      REV 01   740-030658   B11E01020        SFP+-10G-USR
   Xcvr 2      REV 01   740-030658   B11E01023        SFP+-10G-USR
      Xcvr 3      REV 01   740-030658   B11E02819        SFP+-10G-USR
    PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-030658   B11E02812        SFP+-10G-USR
      Xcvr 1      REV 01   740-030658   B11D04437        SFP+-10G-USR
      Xcvr 2      REV 01   740-030658   B11F01279        SFP+-10G-USR
      Xcvr 3      REV 01   740-030658   B11F01333        SFP+-10G-USR
    PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-030658   B11E00978        SFP+-10G-USR
      Xcvr 1      REV 01   740-030658   B11E01018        SFP+-10G-USR
      Xcvr 2      REV 01   740-030658   B11F01784        SFP+-10G-USR
      Xcvr 3      REV 01   740-031980   AK80NKP          SFP+-10G-SR
  FPC 11          REV 32   750-028467   ABBN6790         MPC 3D 16x 10GE
    CPU           REV 10   711-029089   ABBK6515         AMPC PMB
    PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   AK80LZM          SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   AK80MCC          SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   AK80KCM          SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   AK80KE0          SFP+-10G-SR
    PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-021310   C10F99155        SFP+-10G-LRM
      Xcvr 1      REV 01   740-021310   C10F99049        SFP+-10G-LRM
      Xcvr 2      REV 01   740-021310   C10F99128        SFP+-10G-LRM
      Xcvr 3      REV 01   740-021310   C10F99169        SFP+-10G-LRM
    PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
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    Xcvr 0      REV 01   740-031980   AK80LF3          SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   163363A02597     SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   163363A03060     SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   163363A03057     SFP+-10G-SR
  PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   AK80LEX          SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   AK80FEU          SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   AK80FNM          SFP+-10G-SR
    Xcvr 3      REV 01   740-021308   AJQ0Q5G          SFP+-10G-SR
FPC 12          REV 30   750-028467   ZM5111           MPC 3D 16x 10GE
  CPU           REV 10   711-029089   ZP6607           AMPC PMB
  PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   AK80LJA          SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   AK80MFZ          SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   AK80NKL          SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   AK80KF4          SFP+-10G-SR
  PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   AK80FBJ          SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   AK80MM2          SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   AK80LJV          SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   AK80NXV          SFP+-10G-SR
  PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   AK80N1H          SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   AK80NLS          SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   AK80FL5          SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   AK80NL9          SFP+-10G-SR
  PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   AK80NG2          SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   AK80KDU          SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   AK80MG1          SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   AK80MM0          SFP+-10G-SR
FPC 13          REV 30   750-028467   ABBN0208         MPC 3D 16x 10GE
  CPU           REV 10   711-029089   ABBJ1084         AMPC PMB
  PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-030658   B11E04745        SFP+-10G-USR
    Xcvr 1      REV 01   740-030658   B11F01570        SFP+-10G-USR
    Xcvr 2      REV 01   740-030658   B11E04388        SFP+-10G-USR
    Xcvr 3      REV 01   740-030658   B11F01439        SFP+-10G-USR
  PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-030658   B11E04739        SFP+-10G-USR
    Xcvr 1      REV 01   740-030658   B11F01869        SFP+-10G-USR
    Xcvr 2      REV 01   740-030658   B11F01675        SFP+-10G-USR
    Xcvr 3      REV 01   740-030658   B11F01901        SFP+-10G-USR
  PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-030658   B11F01346        SFP+-10G-USR
    Xcvr 1      REV 01   740-030658   B11F01288        SFP+-10G-USR
    Xcvr 2      REV 01   740-030658   B11F01824        SFP+-10G-USR
    Xcvr 3      REV 01   740-030658   B11E04312        SFP+-10G-USR
  PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-030658   B11E02811        SFP+-10G-USR
    Xcvr 1      REV 01   740-030658   B11E03847        SFP+-10G-USR
    Xcvr 2      REV 01   740-030658   B11F01495        SFP+-10G-USR
    Xcvr 3      REV 01   740-030658   B11F01265        SFP+-10G-USR
FPC 14          REV 23   750-028467   YN2977           MPC 3D 16x 10GE
  CPU           REV 10   711-029089   YP1856           AMPC PMB
  PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0      REV 01   740-031980   183363A00875     SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   183363A00851     SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   183363A00772     SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   183363A00882     SFP+-10G-SR
  PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
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      Xcvr 0        REV 01   740-031980   183363A00735      SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   183363A00169      SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   183363A00726      SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   183363A00077      SFP+-10G-SR
    PIC 2                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   183363A00168      SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   183363A00676      SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   183363A00732      SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   183363A00091      SFP+-10G-SR
    PIC 3                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   183363A00725      SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   183363A00642      SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   183363A00871      SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   183363A00853      SFP+-10G-SR
  FPC 15            REV 32   750-028467   ABBN6798          MPC 3D 16x 10GE
    CPU             REV 10   711-029089   ABBK6556          AMPC PMB
    PIC 0                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-021308   9ZDZ06A00055      SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   183363A00239      SFP+-10G-SR
      Xcvr 2        REV 01   740-021308   AD0915E003K       SFP+-10G-SR
      Xcvr 3        REV 01   740-021308   AD0915E003A       SFP+-10G-SR
    PIC 1                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80MRC           SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80NL5           SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80NKN           SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80N3U           SFP+-10G-SR
   PIC 2                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80N1T           SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AJ808DJ           SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80NG4           SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80FND           SFP+-10G-SR
    PIC 3                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80FKQ           SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80NLT           SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80NKR           SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80LKM           SFP+-10G-SR
  FPC 16            REV 30   750-028467   ABBN0270          MPC 3D 16x 10GE
    CPU             REV 10   711-029089   ABBJ0966          AMPC PMB
    PIC 0                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80NL1           SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80NXW           SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80KD2           SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80FMD           SFP+-10G-SR
    PIC 1                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80NKQ           SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80MGH           SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80N38           SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80NL7           SFP+-10G-SR
    PIC 2                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80M5J           SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80NKD           SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80KCY           SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80LHK           SFP+-10G-SR
    PIC 3                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      Xcvr 0        REV 01   740-031980   AK80LEL           SFP+-10G-SR
      Xcvr 1        REV 01   740-031980   AK80MBE           SFP+-10G-SR
      Xcvr 2        REV 01   740-031980   AK80NLG           SFP+-10G-SR
      Xcvr 3        REV 01   740-031980   AK80LFH           SFP+-10G-SR
  FPC 17            REV 32   750-028467   ABBN6796          MPC 3D 16x 10GE
    CPU             REV 10   711-029089   ABBN7259          AMPC PMB
    PIC 0                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
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      Xcvr 0      REV 01   740-031980   B11K01856        SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   B11K01853        SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   B11K01863        SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A02863     SFP+-10G-SR
    PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02668     SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02881     SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A01671     SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A02627     SFP+-10G-SR
    PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02725     SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02692     SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A02730     SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A03081     SFP+-10G-SR
    PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   163363A02736     SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   163363A02568     SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   163363A02747     SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   163363A02579     SFP+-10G-SR
  FPC 18          REV 30   750-028467   ABBN0281         MPC 3D 16x 10GE
    CPU           REV 10   711-029089   ABBN0526         AMPC PMB
  PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-030658   B11F01326        SFP+-10G-USR
      Xcvr 1      REV 01   740-030658   B11E03973        SFP+-10G-USR
      Xcvr 2      REV 01   740-030658   B11E00950        SFP+-10G-USR
      Xcvr 3      REV 01   740-030658   B11E00674        SFP+-10G-USR
    PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-030658   B11E00775        SFP+-10G-USR
      Xcvr 1      REV 01   740-030658   B11E04461        SFP+-10G-USR
      Xcvr 2      REV 01   740-030658   B11E01074        SFP+-10G-USR
      Xcvr 3      REV 01   740-030658   B11E02821        SFP+-10G-USR
    PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-030658   B11E04501        SFP+-10G-USR
      Xcvr 1      REV 01   740-030658   B11E00757        SFP+-10G-USR
      Xcvr 2      REV 01   740-030658   B11F01623        SFP+-10G-USR
      Xcvr 3      REV 01   740-030658   B11E01022        SFP+-10G-USR
    PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-030658   B11E04359        SFP+-10G-USR
      Xcvr 1      REV 01   740-030658   B11E02751        SFP+-10G-USR
      Xcvr 2      REV 01   740-030658   B11E02736        SFP+-10G-USR
      Xcvr 3      REV 01   740-030658   B11E01178        SFP+-10G-USR
  FPC 19          REV 32   750-028467   ABBN6813         MPC 3D 16x 10GE
    CPU           REV 10   711-029089   ABBK6542         AMPC PMB
    PIC 0                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   AK80NA3          SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   AK80NLF          SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   AK80MRH          SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   AK80KE4          SFP+-10G-SR
    PIC 1                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-021308   973152A00030     SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   AK80L9H          SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   AK80ME8          SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   AK80NLR          SFP+-10G-SR
    PIC 2                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   AK80NG1          SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   AK80MCA          SFP+-10G-SR
      Xcvr 2      REV 01   740-031980   AK80LFC          SFP+-10G-SR
      Xcvr 3      REV 01   740-031980   AK80LEM          SFP+-10G-SR
    PIC 3                  BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0      REV 01   740-031980   AK80N9X          SFP+-10G-SR
      Xcvr 1      REV 01   740-031980   AK80LAC          SFP+-10G-SR
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    Xcvr 2        REV 01   740-031980   AK80LF2          SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   AK80N8T          SFP+-10G-SR
ADC 0             REV 13   750-043596   ABBX5561         Adapter Card
ADC 1             REV 13   750-043596   ABBX5546         Adapter Card
ADC 2             REV 13   750-043596   ABBX5535         Adapter Card
ADC 3             REV 13   750-043596   ABBX5552         Adapter Card
ADC 4             REV 13   750-043596   ABBX5581         Adapter Card
ADC 5             REV 13   750-043596   ABBX5545         Adapter Card
ADC 6             REV 13   750-043596   ABBX5554         Adapter Card
ADC 7             REV 07   750-043596   ABBV7194         Adapter Card
ADC 8             REV 07   750-043596   ABBV7251         Adapter Card
ADC 9             REV 07   750-043596   ABBV7202         Adapter Card
ADC 10            REV 13   750-043596   ABBX5579         Adapter Card
ADC 11            REV 13   750-043596   ABBX5548         Adapter Card
ADC 12            REV 13   750-043596   ABBX5575         Adapter Card
ADC 13            REV 13   750-043596   ABBX5539         Adapter Card
ADC 14            REV 13   750-043596   ABBX5555         Adapter Card
ADC 15            REV 13   750-043596   ABBX5557         Adapter Card
ADC 16            REV 13   750-043596   ABBX5536         Adapter Card
ADC 17            REV 13   750-043596   ABBX5559         Adapter Card
ADC 18            REV 13   750-043596   ABBX5537         Adapter Card
ADC 19            REV 11   750-043596   ABBW5685         Adapter Card
Fan Tray 0        REV 04   760-046960   ACAY0090         172mm FanTray - 6 Fans
Fan Tray 1        REV 04   760-046960   ACAY0088         172mm FanTray - 6 Fans
Fan Tray 2        REV 04   760-046960   ACAY0089         172mm FanTray - 6 Fans
Fan Tray 3        REV 04   760-046960   ACAY0108         172mm FanTray - 6 Fans
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show chassis hardware models (MX2020 Router)

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Hardware inventory:
Item              Version  Part number  Serial number    FRU model number
Midplane          REV 27   750-040240   ABAB9384         750-040240
FPM Board         REV 06   760-040242   ABBT8837         760-040242
PSM 0             REV 01   740-045050   1E02224006G      MX2000-PSM-HC-DC-S-A
PSM 1             REV 01   740-045050   1E022240053      MX2000-PSM-HC-DC-S-A
PSM 2             REV 01   740-045050   1E02224004K      MX2000-PSM-HC-DC-S-A
PSM 3             REV 01   740-045050   1E022240056      MX2000-PSM-HC-DC-S-A
PSM 4             REV 01   740-045050   1E022240054      MX2000-PSM-HC-DC-S-A
PSM 5             REV 01   740-045050   1E02224005H      MX2000-PSM-HC-DC-S-A
PSM 6             REV 01   740-045050   1E02224006S      MX2000-PSM-HC-DC-S-A
PSM 7             REV 01   740-045050   1E02224005M      MX2000-PSM-HC-DC-S-A
PSM 8             REV 01   740-045050   1E022240062      MX2000-PSM-HC-DC-S-A
PSM 9             REV 03   740-045050   1EDB2350095      MX2000-PSM-DC-S-A
PSM 10            REV 03   740-045050   1EDB235009L      MX2000-PSM-DC-S-A
PSM 11            REV 03   740-045050   1EDB2350092      MX2000-PSM-DC-S-A
PSM 12            REV 03   740-045050   1EDB23500AT      MX2000-PSM-DC-S-A
PSM 13            REV 03   740-045050   1EDB2350094      MX2000-PSM-DC-S-A
PSM 15            REV 03   740-045050   1EDB235008X      MX2000-PSM-DC-S-A
PDM 0             REV 01   740-045234   1E012150033
PDM 1             REV 01   740-045234   1E012150027
PDM 2             REV 01   740-045234   1E262250072      MX2000-PDM-DC-S-A
Routing Engine 0  REV 02   740-041821   9009094138       RE-S-1800X4-16G-S
Routing Engine 1  REV 02   740-041821   9009089709       RE-S-1800X4-16G-S
CB 0              REV 08   750-040257   CAAB3482         750-040257
CB 1              REV 04   750-040257   ZT2864           750-040257
SFB 0             REV 05   711-044466   ABBT2161         MX2000-SFB-S
SFB 1             REV 05   711-044466   ABBT2159         MX2000-SFB-S
SFB 2             REV 05   711-044466   ABBX3718         MX2000-SFB-S
SFB 4             REV 05   711-044466   ABBT2160         MX2000-SFB-S
SFB 5             REV 05   711-044466   ABBT2145         MX2000-SFB-S
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SFB 7           REV 05   711-044466   ABBT2163        MX2000-SFB-S
FPC 0           REV 30   750-028467   ABBN0284        MPC-3D-16XGE-SFPP
FPC 1           REV 30   750-028467   ABBN0308        MPC-3D-16XGE-SFPP
FPC 2           REV 30   750-028467   ABBN0316        MPC-3D-16XGE-SFPP
FPC 3           REV 32   750-028467   ABBN6832        MPC-3D-16XGE-SFPP
FPC 4           REV 32   750-028467   ABBN6811        MPC-3D-16XGE-SFPP
FPC 5           REV 32   750-028467   ABBN6791        MPC-3D-16XGE-SFPP
FPC 6           REV 30   750-028467   ABBM4592        MPC-3D-16XGE-SFPP
FPC 7           REV 32   750-028467   ABBN6810        MPC-3D-16XGE-SFPP
FPC 8           REV 30   750-028467   ABBM4739        MPC-3D-16XGE-SFPP
FPC 9           REV 32   750-028467   ABBN6827        MPC-3D-16XGE-SFPP
FPC 10          REV 30   750-028467   ABBN0302        MPC-3D-16XGE-SFPP
FPC 11          REV 32   750-028467   ABBN6790        MPC-3D-16XGE-SFPP
FPC 12          REV 30   750-028467   ZM5111          MPC-3D-16XGE-SFPP
FPC 13          REV 30   750-028467   ABBN0208        MPC-3D-16XGE-SFPP
FPC 14          REV 23   750-028467   YN2977          MPC-3D-16XGE-SFPP
FPC 15          REV 32   750-028467   ABBN6798        MPC-3D-16XGE-SFPP
FPC 16          REV 30   750-028467   ABBN0270        MPC-3D-16XGE-SFPP
FPC 17          REV 32   750-028467   ABBN6796        MPC-3D-16XGE-SFPP
FPC 18          REV 30   750-028467   ABBN0281        MPC-3D-16XGE-SFPP
FPC 19          REV 32   750-028467   ABBN6813        MPC-3D-16XGE-SFPP
ADC 0           REV 13   750-043596   ABBX5561        PROTO-ASSEMBLY
ADC 1           REV 13   750-043596   ABBX5546        PROTO-ASSEMBLY
ADC 2           REV 13   750-043596   ABBX5535        MX2000-LC-ADAPTER
ADC 3           REV 13   750-043596   ABBX5552        MX2000-LC-ADAPTER
ADC 4           REV 13   750-043596   ABBX5581        MX2000-LC-ADAPTER
ADC 5           REV 13   750-043596   ABBX5545        PROTO-ASSEMBLY
ADC 6           REV 13   750-043596   ABBX5554        PROTO-ASSEMBLY
ADC 7           REV 07   750-043596   ABBV7194        MX2000-LC-ADAPTER
ADC 8           REV 07   750-043596   ABBV7251        MX2000-LC-ADAPTER
ADC 9           REV 07   750-043596   ABBV7202        MX2000-LC-ADAPTER
ADC 10          REV 13   750-043596   ABBX5579        MX2000-LC-ADAPTER
ADC 12          REV 13   750-043596   ABBX5575        MX2000-LC-ADAPTER
ADC 13          REV 13   750-043596   ABBX5539        PROTO-ASSEMBLY
ADC 14          REV 13   750-043596   ABBX5555        PROTO-ASSEMBLY
ADC 15          REV 13   750-043596   ABBX5557        MX2000-LC-ADAPTER
ADC 16          REV 13   750-043596   ABBX5536        PROTO-ASSEMBLY
ADC 17          REV 13   750-043596   ABBX5559        PROTO-ASSEMBLY
ADC 18          REV 13   750-043596   ABBX5537        PROTO-ASSEMBLY
ADC 19          REV 11   750-043596   ABBW5685        PROTO-ASSEMBLY
Fan Tray 0      REV 04   760-046960   ACAY0090
Fan Tray 1      REV 04   760-046960   ACAY0088
Fan Tray 2      REV 04   760-046960   ACAY0089
Fan Tray 3      REV 04   760-046960   ACAY0108
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show chassis hardware clei-models (MX2020 Router)

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user@ host > show chassis hardware clei-models
Hardware inventory:
Item            Version  Part number  CLEI code       FRU model number
Midplane        REV 27   750-040240   PROTOXCLEI      750-040240
FPM Board       REV 06   760-040242   PROTOXCLEI      760-040242
PSM 0           REV 01   740-045050   IPUPAJMKAA      MX2000-PSM-HC-DC-S-A
PSM 1           REV 01   740-045050   IPUPAJMKAA      MX2000-PSM-HC-DC-S-A
PSM 2           REV 01   740-045050   IPUPAJMKAA      MX2000-PSM-HC-DC-S-A
PSM 3           REV 01   740-045050   IPUPAJMKAA      MX2000-PSM-HC-DC-S-A
PSM 4           REV 01   740-045050   IPUPAJMKAA      MX2000-PSM-HC-DC-S-A
PSM 5           REV 01   740-045050   IPUPAJMKAA      MX2000-PSM-HC-DC-S-A
PSM 6           REV 01   740-045050   IPUPAJMKAA      MX2000-PSM-HC-DC-S-A
PSM 7           REV 01   740-045050   IPUPAJMKAA      MX2000-PSM-HC-DC-S-A
PSM 8           REV 01   740-045050   IPUPAJMKAA      MX2000-PSM-HC-DC-S-A
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PSM 9             REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PSM 10            REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PSM 11            REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PSM 12            REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PSM 13            REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PSM 15            REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PDM 0             REV 01   740-045234
PDM 1             REV 01   740-045234
PDM 2             REV 01   740-045234   IPUPAJSKAA       MX2000-PDM-DC-S-A
Routing Engine 0 REV 02    740-041821                    RE-S-1800X4-16G-S
Routing Engine 1 REV 02    740-041821                    RE-S-1800X4-16G-S
CB 0              REV 08   750-040257   PROTOXCLEI       750-040257
CB 1              REV 04   750-040257   PROTOXCLEI       750-040257
SFB 0             REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
SFB 1             REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
SFB 2             REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
SFB 4             REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
SFB 5             REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
SFB 7             REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
FPC 0             REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 1             REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 2             REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 3             REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 4             REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 5             REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 6             REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 7             REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 8             REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 9             REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 10            REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 11            REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 12            REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 13            REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 14            REV 23   750-028467                    MPC-3D-16XGE-SFPP
FPC 15            REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 16            REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 17            REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 18            REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 19            REV 32   750-028467                    MPC-3D-16XGE-SFPP
ADC 0             REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
ADC 1             REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
ADC 2             REV 13   750-043596   IPUCBA8CAA       MX2000-LC-ADAPTER
ADC 3             REV 13   750-043596   IPUCBA8CAA       MX2000-LC-ADAPTER
ADC 4             REV 13   750-043596   IPUCBA8CAA       MX2000-LC-ADAPTER
ADC 5             REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
ADC 6             REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
ADC 7             REV 07   750-043596   PROTOXCLEI       MX2000-LC-ADAPTER
ADC 8             REV 07   750-043596   PROTOXCLEI       MX2000-LC-ADAPTER
ADC 9             REV 07   750-043596   PROTOXCLEI       MX2000-LC-ADAPTER
ADC 10            REV 13   750-043596   IPUCBA8CAA       MX2000-LC-ADAPTER
ADC 12            REV 13   750-043596   IPUCBA8CAA       MX2000-LC-ADAPTER
ADC 13            REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
ADC 14            REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
ADC 15            REV 13   750-043596   IPUCBA8CAA       MX2000-LC-ADAPTER
ADC 16            REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
ADC 17            REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
ADC 18            REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
ADC 19            REV 11   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
Fan Tray 0        REV 04   760-046960
Fan Tray 1        REV 04   760-046960
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Fan Tray 2        REV 04   760-046960
Fan Tray 3        REV 04   760-046960
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show chassis hardware (MX2020 Router with MPC5EQ and MPC6E)

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user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN120BADBAFJ     MX2020
Midplane         REV 51   750-040240   ABAB9243         Lower Backplane
Midplane 1       REV 04   711-032386   ABAB9399         Upper Backplane
PMP 1            REV 05   711-032428   ACAJ2541         Upper Power Midplane
PMP 0            REV 04   711-032426   ACAJ2194         Lower Power Midplane
FPM Board        REV 13   760-040242   ABCA8835         Front Panel Display
PSM 0            REV 01   740-050037   1EDB32403L5      DC 52V Power Supply
Module
PSM 1            REV 01   740-050037   1EDB32403L3      DC 52V Power Supply
Module
PSM 2            REV 01   740-050037   1EDB32403KM      DC 52V Power Supply
Module
PSM 3            REV 01   740-050037   1EDB3130079      DC 52V Power Supply
Module
PSM 4            REV 01   740-050037   1EDB3130077      DC 52V Power Supply
Module
PSM 5            REV 01   740-050037   1EDB3130020      DC 52V Power Supply
Module
PSM 6            REV 01   740-050037   1EDB313009S      DC 52V Power Supply
Module
PSM 7            REV 01   740-050037   1EDB313008E      DC 52V Power Supply
Module
PSM 8            REV 01   740-050037   1EDB3130063      DC 52V Power Supply
Module
PSM 12           REV 01   740-050037   1EDB3130026      DC 52V Power Supply
Module
PSM 13           REV 01   740-050037   1EDB3130074      DC 52V Power Supply
Module
PSM 14           REV 01   740-050037   1EDB313009D      DC 52V Power Supply
Module
PSM 15           REV 01   740-050037   1EDB3130024      DC 52V Power Supply
Module
PSM 16           REV 01   740-050037   1EDB3130054      DC 52V Power Supply
Module
PSM 17           REV 01   740-050037   1EDB3130080      DC 52V Power Supply
Module
PDM 0            REV 03   740-045234   1EGA3170144      DC Power Dist Module
PDM 1            REV 03   740-045234   1EGA3170158      DC Power Dist Module
PDM 2            REV 03   740-045234   1EGA3170182      DC Power Dist Module
PDM 3            REV 03   740-045234   1EGA3170207      DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009112112       RE-S-1800x4
Routing Engine 1 REV 02   740-041821   9009112087       RE-S-1800x4
CB 0             REV 23   750-040257   CABA2295         Control Board
CB 1             REV 23   750-040257   CABE8379         Control Board
SPMB 0           REV 02   711-041855   ABCE8851         PMB Board
SPMB 1           REV 02   711-041855   ABCE8839         PMB Board
SFB 0            REV 06   711-044466   ABCD5001         Switch Fabric Board
SFB 1            REV 06   711-044466   ABCD5034         Switch Fabric Board
SFB 2            REV 06   711-044466   ABCH3899         Switch Fabric Board
SFB 3            REV 06   711-044466   ABCD5020         Switch Fabric Board
SFB 4            REV 06   711-044466   ABCD4975         Switch Fabric Board
SFB 5            REV 06   711-044466   ABCH3881         Switch Fabric Board
SFB 6            REV 06   711-044466   ABCD5026         Switch Fabric Board
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SFB 7           REV 06   711-044466   ABCD5032        Switch Fabric Board
FPC 0           REV 39   750-045715   CACD1902        MPC5E 3D Q 24XGE+6XLGE
  CPU           REV 09   711-045719   CACB1933        RMPC PMB
  PIC 0                  BUILTIN      BUILTIN         12X10GE SFPP OTN
    Xcvr 0      REV 01   740-031980   B11F00361       SFP+-10G-SR
    Xcvr 2      REV 01   740-021308   19T511101854    SFP+-10G-SR
    Xcvr 3      REV 01   740-021308   19T511100377    SFP+-10G-SR
    Xcvr 4      REV 01   740-031980   ANT0878         SFP+-10G-SR
    Xcvr 5      REV 01   740-021308   19T511100398    SFP+-10G-SR
    Xcvr 6      REV 01   740-021308   AQ4363J         SFP+-10G-SR
    Xcvr 7      REV 01   740-021308   19T511101377    SFP+-10G-SR
    Xcvr 8      REV 01   740-031980   ANT072M         SFP+-10G-SR
    Xcvr 9      REV 01   740-021308   AG90C7N         SFP+-10G-SR
    Xcvr 10     REV 01   740-031980   AM30M09         SFP+-10G-SR
    Xcvr 11     REV 01   740-031980   B10E01016       SFP+-10G-SR
  PIC 1                  BUILTIN      BUILTIN         12X10GE SFPP OTN
 Xcvr 0      REV 01   740-031980   B10L04151       SFP+-10G-SR
    Xcvr 1      REV 01   740-021308   19T511101379    SFP+-10G-SR
    Xcvr 2      REV 01   740-021308   AQ5036J         SFP+-10G-SR
    Xcvr 3      REV 01   740-021308   AG90C4M         SFP+-10G-SR
    Xcvr 4      REV 01   740-021308   19T511101104    SFP+-10G-SR
    Xcvr 5      REV 01   740-021308   AQ502ZM         SFP+-10G-SR
    Xcvr 6      REV 01   740-021308   AN10KY2         SFP+-10G-SR
    Xcvr 7      REV 01   740-021308   AQ43G41         SFP+-10G-SR
    Xcvr 8      REV 01   740-021308   AQ41F04         SFP+-10G-SR
    Xcvr 9      REV 01   740-031980   AMS16N3         SFP+-10G-SR
    Xcvr 10     REV 01   740-021308   AMH04Y3         SFP+-10G-SR
    Xcvr 11     REV 01   740-021308   ANA093E         SFP+-10G-SR
  PIC 2                  BUILTIN      BUILTIN         3X40GE QSFPP
  PIC 3                  BUILTIN      BUILTIN         3X40GE QSFPP
  WAN MEZZ      REV 09   750-049136   CABN0410        MPC5E 24XGE OTN Mezz
FPC 1           REV 11   750-045372   CABK8112        MPCE Type 3 3D
  CPU           REV 08   711-035209   CABJ6621        HMPC PMB 2G
  MIC 0         REV 07   750-033307   CAAZ2897        10X10GE SFPP
    PIC 0                BUILTIN      BUILTIN         10X10GE SFPP
      Xcvr 0    REV 01   740-021308   AQ501VK         SFP+-10G-SR
      Xcvr 1    REV 01   740-021308   AQ501YC         SFP+-10G-SR
      Xcvr 2    REV 01   740-021308   AQ43HJF         SFP+-10G-SR
      Xcvr 3    REV 01   740-021308   AQ43H8D         SFP+-10G-SR
      Xcvr 4    REV 01   740-021308   19T511100370    SFP+-10G-SR
      Xcvr 5    REV 01   740-031980   153363A00763    SFP+-10G-SR
      Xcvr 6    REV 01   740-021308   APH2LXB         SFP+-10G-SR
      Xcvr 7    REV 01   740-031980   AMC0LVV         SFP+-10G-SR
      Xcvr 8    REV 01   740-031980   B11F00230       SFP+-10G-SR
  MIC 1         REV 14   750-033196   CAAP1390        1X100GE CXP
    PIC 2                BUILTIN      BUILTIN         1X100GE CXP
      Xcvr 0    REV 01   740-032166   XB11F000M       CFP2-100G-SR10
FPC 2           REV 17   750-037355   CAAS5826        MPC4E 3D 2CGE+8XGE
  CPU           REV 08   711-035209   CAAR3986        HMPC PMB 2G
  PIC 0                  BUILTIN      BUILTIN         4x10GE SFPP
    Xcvr 0      REV 01   740-021308   T09F43722       SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   ALP0KXF         SFP+-10G-SR
    Xcvr 2      REV 01   740-021308   AQ502FG         SFP+-10G-SR
    Xcvr 3      REV 01   740-021308   AQ502T7         SFP+-10G-SR
  PIC 1                  BUILTIN      BUILTIN         1X100GE CFP
    Xcvr 0      REV 01   740-035329   X12J00571       CFP-100G-SR10
  PIC 2                  BUILTIN      BUILTIN         4x10GE SFPP
    Xcvr 0      REV 01   740-031980   AJ71KEH         SFP+-10G-SR
    Xcvr 1      REV 01   740-031980   B11E01355       SFP+-10G-SR
    Xcvr 3      REV 01   740-031980   B11F00249       SFP+-10G-SR
  PIC 3                  BUILTIN      BUILTIN         1X100GE CFP
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FPC 3            REV 05   750-044444   CAAY9920          MPCE Type 2 3D P
  CPU            REV 04   711-038484   CAAW3639          MPCE PMB 2G
  MIC 0          REV 28   750-028387   CAAX1083          3D 4x 10GE  XFP
    PIC 0                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0              NON-JNPR     CC07BK05B         XFP-10G-SR
      Xcvr 1     REV 01   740-011571   C728XJ00U         XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0              NON-JNPR     T12L92339         XFP-10G-SR
  QXM 0          REV 06   711-028408   CAAW4915          MPC QXM
  QXM 1          REV 06   711-028408   CAAW4894          MPC QXM
FPC 4            REV 18   750-046005   CACH5661          MPC5E 3D Q 2CGE+4XGE
 CPU            REV 09   711-045719   CACF2880          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-046563   XD16FC03Y         CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-049775   J13K72997         CFP2-100G-LR4-D
FPC 5            REV 35   750-028467   CAAR2623          MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAR0491          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ5027T           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ502J0           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ5027S           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ501Y7           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ501YB           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ503EB           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ43HJH           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ43J0Y           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ50352           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ501X6           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ502NV           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502ZJ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ502H4           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ43HJK           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJ30CU7           SFP+-10G-SR
FPC 9            REV 30   750-044130   ABCF5773          MPC6E 3D
  CPU            REV 09   711-045719   ABCF1270          RMPC PMB
  MIC 0          REV 05   750-049457   ABCD7829          2X100GE CFP2 OTN
    PIC 0                 BUILTIN      BUILTIN           2X100GE CFP2 OTN
      Xcvr 0              NON-JNPR     FE13F000K         CFP2-100G-SR10
      Xcvr 1     REV 01   740-048813   XD32FE017         CFP2-100G-LR-D
  MIC 1          REV 07   750-049457   ABCK2812          2X100GE CFP2 OTN
    PIC 1                 BUILTIN      BUILTIN           2X100GE CFP2 OTN
      Xcvr 0     REV 01   740-048813   XD32FE018         CFP2-100G-SR10
      Xcvr 1              NON-JNPR     FE13F000E         CFP2-100G-LR4-D
  XLM 0          REV 05.2.00 711-046638 ABCF5915         MPC6E XL
  XLM 1          REV 05.2.00 711-046638 ABCF5916         MPC6E XL
FPC 10           REV 36   750-044130   ABCS8602          MPC6E 3D
  CPU            REV 09   711-045719   ABCS8779          RMPC PMB
  MIC 0          REV 06   750-049979   ABCK2656          24X10GE SFPP OTN
    PIC 0                 BUILTIN      BUILTIN           24X10GE SFPP OTN
      Xcvr 0     REV 01   740-021308   AQ43J08           SFP+-10G-SR
      Xcvr 1     REV 01   740-021308   AQE1Y2E           SFP+-10G-SR
      Xcvr 2     REV 01   740-021308   AQE1UW4           SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQE1MQF           SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   AQG0MN1           SFP+-10G-SR
      Xcvr 5     REV 01   740-021308   AQE1L9M           SFP+-10G-SR
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      Xcvr 6     REV 01   740-021308   AQG0MPD          SFP+-10G-SR
      Xcvr 7     REV 01   740-021308   AQE1Y2B          SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AQG0LT5          SFP+-10G-SR
      Xcvr 9     REV 01   740-021308   AQD2ET4          SFP+-10G-SR
      Xcvr 10    REV 01   740-021308   AQG0MPC          SFP+-10G-SR
      Xcvr 11    REV 01   740-021308   AQG0M63          SFP+-10G-SR
     Xcvr 12    REV 01   740-021308   AQG0LT1          SFP+-10G-SR
      Xcvr 13    REV 01   740-021308   AQG0M4L          SFP+-10G-SR
      Xcvr 14    REV 01   740-021308   AQG0LS7          SFP+-10G-SR
      Xcvr 15    REV 01   740-021308   AQE1MQB          SFP+-10G-SR
      Xcvr 16    REV 01   740-021308   AQG0LZP          SFP+-10G-SR
      Xcvr 17    REV 01   740-021308   AQE1LU9          SFP+-10G-SR
      Xcvr 18    REV 01   740-021308   AQG0MRZ          SFP+-10G-SR
      Xcvr 19    REV 01   740-021308   AQE1MQ9          SFP+-10G-SR
      Xcvr 20    REV 01   740-021308   AQG0LRX          SFP+-10G-SR
      Xcvr 21    REV 01   740-021308   AQE1UWD          SFP+-10G-SR
      Xcvr 22    REV 01   740-021308   AQG0LT4          SFP+-10G-SR
      Xcvr 23    REV 01   740-021308   AQE1MQL          SFP+-10G-SR
  MIC 1          REV 12   750-050008   ABCK5372         4X100GE CXP
    PIC 1                 BUILTIN      BUILTIN          4X100GE CXP
      Xcvr 3     REV 01   740-046563   XD16FC02Z        CFP2-100G-SR10
  XLM 0          REV 07.2.00 711-046638 ABCK3481        MPC6E XL
  XLM 1          REV 07.2.00 711-046638 ABCK4725        MPC6E XL
FPC 17           REV 28   750-044130   ABBZ3873         MPC6E 3D
  CPU            REV 08   711-045719   ABBZ3770         RMPC PMB
  MIC 0          REV 11   750-046535   ABCC7731         24X10GE SFPP
    PIC 0                 BUILTIN      BUILTIN          24X10GE SFPP
      Xcvr 1     REV 01   740-021308   APK0543          SFP+-10G-SR
      Xcvr 2     REV 01   740-031980   B10G01119        SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQ502SX          SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   AQ43H84          SFP+-10G-SR
      Xcvr 5     REV 01   740-021308   AQ501TB          SFP+-10G-SR
      Xcvr 6     REV 01   740-021308   AQ502JZ          SFP+-10G-SR
      Xcvr 7     REV 01   740-021308   AQ502SC          SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AQ502JW          SFP+-10G-SR
      Xcvr 9     REV 01   740-021308   AQ502RM          SFP+-10G-SR
      Xcvr 10    REV 01   740-031980   AHK013B          SFP+-10G-SR
      Xcvr 11    REV 01   740-021308   AQG0MRT          SFP+-10G-SR
      Xcvr 13    REV 01   740-031980   AMC0JTC          SFP+-10G-SR
      Xcvr 14    REV 01   740-021308   ANA0MQ0          SFP+-10G-SR
      Xcvr 15    REV 01   740-021308   AQ502GS          SFP+-10G-SR
      Xcvr 16    REV 01   740-021308   AQG0M0J          SFP+-10G-SR
      Xcvr 17    REV 01   740-021308   AQG0MUR          SFP+-10G-SR
      Xcvr 18    REV 01   740-021308   AQG0MRR          SFP+-10G-SR
      Xcvr 19    REV 01   740-021308   AQG0M0F          SFP+-10G-SR
      Xcvr 20    REV 01   740-021308   AQ50312          SFP+-10G-SR
      Xcvr 21    REV 01   740-021308   AQ5032U          SFP+-10G-SR
      Xcvr 22    REV 01   740-021308   APE17B5          SFP+-10G-SR
      Xcvr 23    REV 01   740-021309   91D104A00011     SFP+-10G-LR
  MIC 1          REV 03   750-050008   ABCC4522         4X100GE CXP
    PIC 1                 BUILTIN      BUILTIN          4X100GE CXP
      Xcvr 0     REV 01   740-046563   XD16FC02U        CFP2-100G-SR10
      Xcvr 1     REV 01   740-046563   XC42FC03K        CFP2-100G-SR10
      Xcvr 2     REV 01   740-046563   XC42FC01Z        CFP2-100G-SR10
      Xcvr 3     REV 01   740-046563   XC42FC02U        CFP2-100G-SR10
  XLM 0          REV 04.2.00 711-046638 ABBZ3779        MPC6E XL
  XLM 1          REV 04.2.00 711-046638 ABBZ3780        MPC6E XL
FPC 18           REV 39   750-045715   CACD1910         MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 09   711-045719   CACD1817         RMPC PMB
  PIC 0                   BUILTIN      BUILTIN          12X10GE SFPP OTN
  PIC 1                   BUILTIN      BUILTIN          12X10GE SFPP OTN
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  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
 Xcvr 0       REV 01   740-046565   QD130194          QSFP+-40G-SR4
    Xcvr 1        REV 01   740-046565   QD130193          QSFP+-40G-SR4
    Xcvr 2        REV 01   740-046565   QD130196          QSFP+-40G-SR4
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
    Xcvr 0        REV 01   740-046565   QD130191          QSFP+-40G-SR4
    Xcvr 1        REV 01   740-046565   QD130198          QSFP+-40G-SR4
    Xcvr 2        REV 01   740-046565   QD130192          QSFP+-40G-SR4
  WAN MEZZ        REV 09   750-049136   CABN0411          MPC5E 24XGE OTN Mezz
FPC 19            REV 39   750-045715   CACD1908          MPC5E 3D Q 24XGE+6XLGE
  CPU             REV 09   711-045719   CACD1820          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           12X10GE SFPP OTN
    Xcvr 0        REV 01   740-021308   AQA0EXJ           SFP+-10G-SR
    Xcvr 1        REV 01   740-021308   AQG0M6D           SFP+-10G-SR
    Xcvr 2        REV 01   740-021308   AQG0LW7           SFP+-10G-SR
    Xcvr 3        REV 01   740-021308   AQA0JKB           SFP+-10G-SR
    Xcvr 4        REV 01   740-021308   AQG0MTM           SFP+-10G-SR
    Xcvr 5        REV 01   740-021308   AQA07NE           SFP+-10G-SR
    Xcvr 6        REV 01   740-021308   AQG0M41           SFP+-10G-SR
    Xcvr 7        REV 01   740-021308   AQG0MU7           SFP+-10G-SR
    Xcvr 8        REV 01   740-021308   AQG0MUG           SFP+-10G-SR
    Xcvr 9        REV 01   740-021308   AQG0MMX           SFP+-10G-SR
    Xcvr 10       REV 01   740-021308   AQG0M5K           SFP+-10G-SR
    Xcvr 11       REV 01   740-021308   AQG0LVZ           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP OTN
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
    Xcvr 0        REV 01   740-046565   QD130242          QSFP+-40G-SR4
    Xcvr 1        REV 01   740-046565   QD130245          QSFP+-40G-SR4
    Xcvr 2        REV 01   740-046565   QD130613          QSFP+-40G-SR4
  WAN MEZZ        REV 09   750-049136   CABN0418          MPC5E 24XGE OTN Mezz
ADC 0             REV 17   750-043596   ABCD5378          Adapter Card
ADC 1             REV 17   750-043596   ABCD5465          Adapter Card
ADC 2             REV 17   750-043596   ABCD5431          Adapter Card
ADC 3             REV 17   750-043596   ABCD5356          Adapter Card
ADC 4             REV 02   750-043596   ZW1545            Adapter Card
ADC 5             REV 17   750-043596   ABCD5517          Adapter Card
ADC 18            REV 17   750-043596   ABCD5535          Adapter Card
ADC 19            REV 01   750-043596   ZV4127            Adapter Card
Fan Tray 0        REV 06   760-046960   ACAY0791          172mm FanTray - 6 Fans
Fan Tray 1        REV 06   760-046960   ACAY0788          172mm FanTray - 6 Fans
Fan Tray 2        REV 06   760-046960   ACAY0755          172mm FanTray - 6 Fans
Fan Tray 3        REV 06   760-046960   ACAY0441          172mm FanTray - 6 Fans
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show chassis hardware detail (MX2020 Router with MPC5EQ and MPC6E)

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user@host>show chassis hardware detail
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN120BADBAFJ      MX2020
Midplane          REV 51   750-040240   ABAB9243          Lower Backplane
Midplane 1        REV 04   711-032386   ABAB9399          Upper Backplane
PMP 1             REV 05   711-032428   ACAJ2541          Upper Power Midplane
PMP 0             REV 04   711-032426   ACAJ2194          Lower Power Midplane
FPM Board         REV 13   760-040242   ABCA8835          Front Panel Display
PSM 0             REV 01   740-050037   1EDB32403L5       DC 52V Power Supply
Module
PSM 1             REV 01   740-050037   1EDB32403L3       DC 52V Power Supply
Module
PSM 2             REV 01   740-050037   1EDB32403KM       DC 52V Power Supply
Module
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PSM 3            REV 01   740-050037   1EDB3130079       DC 52V Power Supply
Module
PSM 4            REV 01   740-050037   1EDB3130077       DC 52V Power Supply
Module
PSM 5            REV 01   740-050037   1EDB3130020       DC 52V Power Supply
Module
PSM 6            REV 01   740-050037   1EDB313009S       DC 52V Power Supply
Module
PSM 7            REV 01   740-050037   1EDB313008E       DC 52V Power Supply
Module
PSM 8            REV 01   740-050037   1EDB3130063       DC 52V Power Supply
Module
PSM 12           REV 01   740-050037   1EDB3130026       DC 52V Power Supply
Module
PSM 13           REV 01   740-050037   1EDB3130074       DC 52V Power Supply
Module
PSM 14           REV 01   740-050037   1EDB313009D       DC 52V Power Supply
Module
PSM 15           REV 01   740-050037   1EDB3130024       DC 52V Power Supply
Module
PSM 16           REV 01   740-050037   1EDB3130054       DC 52V Power Supply
Module
PSM 17           REV 01   740-050037   1EDB3130080       DC 52V Power Supply
Module
PDM 0            REV 03   740-045234   1EGA3170144       DC Power Dist Module
PDM 1            REV 03   740-045234   1EGA3170158       DC Power Dist Module
PDM 2            REV 03   740-045234   1EGA3170182       DC Power Dist Module
PDM 3            REV 03   740-045234   1EGA3170207       DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009112112        RE-S-1800x4
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200274310822 113 Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000031656       Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02   740-041821   9009112087        RE-S-1800x4
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200274310822 366 Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000039979       Disk 1
CB 0             REV 23   750-040257   CABA2295          Control Board
CB 1             REV 23   750-040257   CABE8379          Control Board
SPMB 0
SPMB 1
FPC 0            REV 39   750-045715   CACD1902          MPC5E 3D Q 24XGE+6XLGE
  CPU
FPC 1            REV 11   750-045372   CABK8112          MPCE Type 3 3D
  CPU
FPC 2            REV 17   750-037355   CAAS5826          MPC4E 3D 2CGE+8XGE
  CPU
FPC 3            REV 05   750-044444   CAAY9920          MPCE Type 2 3D P
  CPU
FPC 4            REV 18   750-046005   CACH5661          MPC5E 3D Q 2CGE+4XGE
  CPU
FPC 5            REV 35   750-028467   CAAR2623          MPC 3D 16x 10GE
 CPU
FPC 9            REV 30   750-044130   ABCF5773          MPC6E 3D
  CPU
FPC 10           REV 36   750-044130   ABCS8602          MPC6E 3D
  CPU
FPC 17           REV 28   750-044130   ABBZ3873          MPC6E 3D
```



```
  CPU
FPC 18           REV 39   750-045715   CACD1910         MPC5E 3D Q 24XGE+6XLGE
  CPU
FPC 19           REV 39   750-045715   CACD1908         MPC5E 3D Q 24XGE+6XLGE
  CPU
Fan Tray 0       REV 06   760-046960   ACAY0791         172mm FanTray - 6 Fans
Fan Tray 1       REV 06   760-046960   ACAY0788         172mm FanTray - 6 Fans
Fan Tray 2       REV 06   760-046960   ACAY0755         172mm FanTray - 6 Fans
Fan Tray 3       REV 06   760-046960   ACAY0441         172mm FanTray - 6 Fans
```

show chassis hardware extensive (MX2020 Router with MPC5EQ and MPC6E)

```
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN120BADBAFJ      MX2020
 Jedec Code:    0x7fb0            EEPROM Version:    0x02
                                  S/N:               JN120BADBAFJ
 Assembly ID:   0x0557            Assembly Version:  00.00
 Date:          00-00-0000        Assembly Flags:    0x00
 ID: MX2020
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 32 30 42 41 44 42 41 46 4a 00 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 51   750-040240   ABAB9243          Lower Backplane
 Jedec Code:    0x7fb0            EEPROM Version:    0x02
 P/N:           750-040240        S/N:               ABAB9243
 Assembly ID:   0x0b22            Assembly Version:  01.51
 Date:          05-30-2013        Assembly Flags:    0x00
 Version:       REV 51            CLEI Code:         IPMU710ARA
 ID: Lower Backplane              FRU Model Number:  CHAS-BP-MX2020-S
 Board Information Record:
  Address 0x00: ad 01 10 00 4c 96 14 72 30 08 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 22 01 33 52 45 56 20 35 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 30 32 34 30 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 39 32 34 33 00 1e 05 07
  Address 0x30: dd ff ff ff ad 01 10 00 4c 96 14 72 30 08 ff ff
  Address 0x40: ff ff ff ff 01 49 50 4d 55 37 31 30 41 52 41 43
  Address 0x50: 48 41 53 2d 42 50 2d 4d 58 32 30 32 30 2d 53 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff d3 ff ff ff ff ff ff ff ff ff ff ff ff
Midplane 1       REV 04   711-032386   ABAB9399          Upper Backplane
 Jedec Code:    0x7fb0            EEPROM Version:    0x01
 P/N:           711-032386        S/N:               ABAB9399
 Assembly ID:   0x0b23            Assembly Version:  01.04
 Date:          10-22-2012        Assembly Flags:    0x00
 Version:       REV 04
 ID: Upper Backplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 fe 0b 23 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 33 38 36 00 00
```

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  Address 0x20: 53 2f 4e 20 41 42 41 42 39 33 39 39 00 16 0a 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP 1            REV 05   711-032428   ACAJ2541         Upper Power Midplane
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          711-032428       S/N:               ACAJ2541
 Assembly ID:  0x045c           Assembly Version:  01.05
 Date:         04-26-2013       Assembly Flags:    0x00
 Version:      REV 05
 ID: Upper Power Midplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 5c 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 38 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 4a 32 35 34 31 00 1a 04 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP 0            REV 04   711-032426   ACAJ2194         Lower Power Midplane
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          711-032426       S/N:               ACAJ2194
 Assembly ID:  0x045d           Assembly Version:  01.04
 Date:         01-29-2013       Assembly Flags:    0x00
 Version:      REV 04
 ID: Lower Power Midplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 4a 32 31 39 34 00 1d 01 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 13   760-040242   ABCA8835         Front Panel Display
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          760-040242       S/N:               ABCA8835
 Assembly ID:  0x0b24           Assembly Version:  01.13
 Date:         04-13-2013       Assembly Flags:    0x00
 Version:      REV 13           CLEI Code:         IPMYAE5JRA
 ID: Front Panel Display        FRU Model Number:  MX2020-CRAFT-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 24 01 0d 52 45 56 20 31 33 00 00
  Address 0x10: 00 00 00 00 37 36 30 2d 30 34 30 32 34 32 00 00
  Address 0x20: 53 2f 4e 20 41 42 43 41 38 38 33 35 00 0d 04 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 4d 59 41 45 35 4a 52 41 4d
  Address 0x50: 58 32 30 32 30 2d 43 52 41 46 54 2d 53 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 95 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0            REV 01   740-050037   1EDB32403L5      DC 52V Power Supply
```



```
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB32403L5
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         06-21-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 34 30 33 4c 35 00 00 15 06 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1            REV 01   740-050037   1EDB32403L3       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB32403L3
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         06-21-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 34 30 33 4c 33 00 00 15 06 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 2            REV 01   740-050037   1EDB32403KM       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB32403KM
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         06-21-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 34 30 33 4b 4d 00 00 15 06 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 3            REV 01   740-050037   1EDB3130079       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB3130079
 Assembly ID:  0x0478           Assembly Version:  01.01
```

```
 Date:         05-16-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 37 39 00 00 10 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 4            REV 01   740-050037   1EDB3130077       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130077
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-17-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 37 37 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 5            REV 01   740-050037   1EDB3130020       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130020
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-16-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 32 30 00 00 10 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 6            REV 01   740-050037   1EDB313009S       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB313009S
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-17-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
```

```
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 39 53 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 7            REV 01   740-050037   1EDB313008E       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB313008E
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-17-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 38 45 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 8            REV 01   740-050037   1EDB3130063       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130063
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-17-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 36 33 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 12           REV 01   740-050037   1EDB3130026       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130026
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-16-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
```

```
  Address 0x20: 31 45 44 42 33 31 33 30 30 32 36 00 00 10 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 13           REV 01   740-050037   1EDB3130074       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB3130074
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         05-17-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 37 34 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 14           REV 01   740-050037   1EDB313009D       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB313009D
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         05-17-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 39 44 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 15           REV 01   740-050037   1EDB3130024       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-050037       S/N:               1EDB3130024
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         05-16-2013       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
...
```

show chassis hardware models (MX2020 Routers with MPC5EQ and MPC6E)

`user@host>` **show chassis hardware models**


```
Hardware inventory:
Item              Version  Part number  Serial number     FRU model number
Midplane          REV 51   750-040240   ABAB9243          CHAS-BP-MX2020-S
FPM Board         REV 13   760-040242   ABCA8835          MX2020-CRAFT-S
PSM 0             REV 01   740-050037   1EDB32403L5       MX2000-PSM-DC-S
PSM 1             REV 01   740-050037   1EDB32403L3       MX2000-PSM-DC-S
PSM 2             REV 01   740-050037   1EDB32403KM       MX2000-PSM-DC-S
PSM 3             REV 01   740-050037   1EDB3130079       MX2000-PSM-DC-S
PSM 4             REV 01   740-050037   1EDB3130077       MX2000-PSM-DC-S
PSM 5             REV 01   740-050037   1EDB3130020       MX2000-PSM-DC-S
PSM 6             REV 01   740-050037   1EDB313009S       MX2000-PSM-DC-S
PSM 7             REV 01   740-050037   1EDB313008E       MX2000-PSM-DC-S
PSM 8             REV 01   740-050037   1EDB3130063       MX2000-PSM-DC-S
PSM 12            REV 01   740-050037   1EDB3130026       MX2000-PSM-DC-S
PSM 13            REV 01   740-050037   1EDB3130074       MX2000-PSM-DC-S
PSM 14            REV 01   740-050037   1EDB313009D       MX2000-PSM-DC-S
PSM 15            REV 01   740-050037   1EDB3130024       MX2000-PSM-DC-S
PSM 16            REV 01   740-050037   1EDB3130054       MX2000-PSM-DC-S
PSM 17            REV 01   740-050037   1EDB3130080       MX2000-PSM-DC-S
PDM 0             REV 03   740-045234   1EGA3170144       MX2000-PDM-DC-S
PDM 1             REV 03   740-045234   1EGA3170158       MX2000-PDM-DC-S
PDM 2             REV 03   740-045234   1EGA3170182       MX2000-PDM-DC-S
PDM 3             REV 03   740-045234   1EGA3170207       MX2000-PDM-DC-S
Routing Engine 0 REV 02   740-041821   9009112112        RE-MX2000-1800X4-S
Routing Engine 1 REV 02   740-041821   9009112087        RE-MX2000-1800X4-S
CB 0              REV 23   750-040257   CABA2295          RE-MX2000-1800X4-S
CB 1              REV 23   750-040257   CABE8379          RE-MX2000-1800X4-S
SFB 0             REV 06   711-044466   ABCD5001          MX2000-SFB-S
SFB 1             REV 06   711-044466   ABCD5034          MX2000-SFB-S
SFB 2             REV 06   711-044466   ABCH3899          MX2000-SFB-S
SFB 3             REV 06   711-044466   ABCD5020          MX2000-SFB-S
SFB 4             REV 06   711-044466   ABCD4975          MX2000-SFB-S
SFB 5             REV 06   711-044466   ABCH3881          MX2000-SFB-S
SFB 6             REV 06   711-044466   ABCD5026          MX2000-SFB-S
SFB 7             REV 06   711-044466   ABCD5032          MX2000-SFB-S
FPC 0             REV 39   750-045715   CACD1902          PROTO-ASSEMBLY
FPC 1             REV 11   750-045372   CABK8112          MX-MPC3E-3D
FPC 2             REV 17   750-037355   CAAS5826          MPC4E-3D-2CGE-8XGE
FPC 3             REV 05   750-044444   CAAY9920          MX-MPC2E-3D-P
FPC 4             REV 18   750-046005   CACH5661          PROTO-ASSEMBLY
FPC 5             REV 35   750-028467   CAAR2623          MPC-3D-16XGE-SFPP
FPC 9             REV 30   750-044130   ABCF5773          PROTO-ASSEMBLY
FPC 10            REV 36   750-044130   ABCS8602          PROTO-ASSEMBLY
FPC 17            REV 28   750-044130   ABBZ3873          PROTO-ASSEMBLY
FPC 18            REV 39   750-045715   CACD1910          PROTO-ASSEMBLY
FPC 19            REV 39   750-045715   CACD1908          PROTO-ASSEMBLY
ADC 0             REV 17   750-043596   ABCD5378          MX2000-LC-ADAPTER
ADC 1             REV 17   750-043596   ABCD5465          MX2000-LC-ADAPTER
ADC 2             REV 17   750-043596   ABCD5431          MX2000-LC-ADAPTER
ADC 3             REV 17   750-043596   ABCD5356          MX2000-LC-ADAPTER
ADC 4             REV 02   750-043596   ZW1545            750-043596
ADC 5             REV 17   750-043596   ABCD5517          MX2000-LC-ADAPTER
ADC 18            REV 17   750-043596   ABCD5535          MX2000-LC-ADAPTER
ADC 19            REV 01   750-043596   ZV4127            750-043596
Fan Tray 0        REV 06   760-046960   ACAY0791          MX2000-FANTRAY-S
Fan Tray 1        REV 06   760-046960   ACAY0788          MX2000-FANTRAY-S
Fan Tray 2        REV 06   760-046960   ACAY0755          MX2000-FANTRAY-S
Fan Tray 3        REV 06   760-046960   ACAY0441          MX2000-FANTRAY-S
```


show chassis hardware clei-models (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 51   750-040240   IPMU710ARA        CHAS-BP-MX2020-S
FPM Board        REV 13   760-040242   IPMYAE5JRA        MX2020-CRAFT-S
PSM 0            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 1            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 2            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 3            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 4            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 5            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 6            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 7            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 8            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 12           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 13           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 14           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 15           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 16           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 17           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PDM 0            REV 03   740-045234   IPUPAJSKAA        MX2000-PDM-DC-S
PDM 1            REV 03   740-045234   IPUPAJSKAA        MX2000-PDM-DC-S
PDM 2            REV 03   740-045234   IPUPAJSKAA        MX2000-PDM-DC-S
PDM 3            REV 03   740-045234   IPUPAJSKAA        MX2000-PDM-DC-S
CB 0             REV 23   750-040257   IPUCBA7CTA        RE-MX2000-1800X4-S
CB 1             REV 23   750-040257   IPUCBA7CTA        RE-MX2000-1800X4-S
SFB 0            REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 1            REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 2            REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 3            REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 4            REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 5            REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 6            REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 7            REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
FPC 0            REV 39   750-045715   PROTOXCLEI        PROTO-ASSEMBLY
FPC 1            REV 11   750-045372   COUIBBNBAA        MX-MPC3E-3D
FPC 2            REV 17   750-037355   IPU3A4DHAA        MPC4E-3D-2CGE-8XGE
FPC 3            REV 05   750-044444   COUIBBGBAA        MX-MPC2E-3D-P
  MIC 0          REV 28   750-028387   COUIA16BAA        MIC-3D-4XGE-XFP
FPC 4            REV 18   750-046005   PROTOXCLEI        PROTO-ASSEMBLY
FPC 5            REV 35   750-028467                     MPC-3D-16XGE-SFPP
FPC 9            REV 30   750-044130   PROTOXCLEI        PROTO-ASSEMBLY
  MIC 0          REV 05   750-049457   PROTOXCLEI        PROTO-ASSEMBLY
FPC 10           REV 36   750-044130   PROTOXCLEI        PROTO-ASSEMBLY
  MIC 0          REV 06   750-049979   PROTOXCLEI        PROTO-ASSEMBLY
  MIC 1          REV 12   750-050008   PROTOXCLEI        PROTO-ASSEMBLY
FPC 17           REV 28   750-044130   PROTOXCLEI        PROTO-ASSEMBLY
  MIC 1          REV 03   750-050008   PROTOXCLEI        PROTO-ASSEMBLY
FPC 18           REV 39   750-045715   PROTOXCLEI        PROTO-ASSEMBLY
FPC 19           REV 39   750-045715   PROTOXCLEI        PROTO-ASSEMBLY
ADC 0            REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 1            REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 2            REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 3            REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 4            REV 02   750-043596   PROTOXCLEI        750-043596
ADC 5            REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 18           REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 19           REV 01   750-043596   PROTOXCLEI        750-043596
Fan Tray 0       REV 06   760-046960   IPUCBA5CAA        MX2000-FANTRAY-S
```



```
Fan Tray 1        REV 06    760-046960    IPUCBA5CAA        MX2000-FANTRAY-S
Fan Tray 2        REV 06    760-046960    IPUCBA5CAA        MX2000-FANTRAY-S
Fan Tray 3        REV 06    760-046960    IPUCBA5CAA        MX2000-FANTRAY-S
```

show chassis hardware (MX Series routers with ATM MIC)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN115736EAFC      MX240
Midplane          REV 07   760-021404   ABAA5038          MX240 Backplane
FPM Board         REV 03   760-021392   ABBA2758          Front Panel Display
PEM 0             Rev 01   740-022697   QCS0937C07K       PS 1.2-1.7kW; 100-240V
AC in
PEM 1             Rev 01   740-022697   QCS0939C04X       PS 1.2-1.7kW; 100-240V
AC in
PEM 2             Rev 01   740-022697   QCS0937C06B       PS 1.2-1.7kW; 100-240V
AC in
PEM 3             Rev 01   740-022697   QCS0937C07U       PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 12    740-013063   9009042291        RE-S-2000
Routing Engine 1 REV 12    740-013063   9009042266        RE-S-2000
CB 0              REV 06   710-021523   ABBC1435          MX SCB
CB 1              REV 06   710-021523   ABBC1497          MX SCB
FPC 2      REV 14    750-031088    YH8446           MPC Type 2 3D Q
  CPU             REV 06   711-030884   YH9612            MPC PMB 2G
  MIC 0
  MIC 1           REV 10   750-036132   ZP7062            2xOC12/8xOC3 CC-CE
    PIC 2                  BUILTIN      BUILTIN           2xOC12/8xOC3 CC-CE

  Xcvr 0               NON-JNPR     23393-00492       UNKNOWN
      Xcvr 1               NON-JNPR     23393-00500       UNKNOWN
      Xcvr 2               NON-JNPR     23393-00912       UNKNOWN
      Xcvr 3      REV 01   740-015638   22216-00575       Load SFP
      Xcvr 4      REV 01   740-015638   24145-00110       Load SFP
      Xcvr 5      REV 01   740-015638   24145-00016       Load SFP
      Xcvr 6      REV 01   740-015638   24145-00175       Load SFP
      Xcvr 7               NON-JNPR     23393-00627       UNKNOWN
  QXM 0           REV 05   711-028408   YF4681            MPC QXM
  QXM 1           REV 05   711-028408   YF4817            MPC QXM
Fan Tray 0        REV 01   710-021113   XL3645            MX240 Fan Tray
```

show chassis hardware (MX240, MX480, MX960 routers with Application Services Modular Line Card)

```
user@host>show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN11D969BAFA      MX960
Midplane          REV 03   710-013698   ACAA2362          MX960 Backplane
FPM Board         REV 03   710-014974   ZR0639            Front Panel Display
PDM              Rev 03   740-013110   QCS152250SX      Power Distribution Module
PEM 0             Rev 10   740-013683   QCS1512718W       DC Power Entry Module
PEM 1             Rev 10   740-013683   QCS1512702Y       DC Power Entry Module
Routing Engine 0 REV 15    740-013063   9012024667        RE-S-2000
Routing Engine 1 REV 15    740-013063   9012024649        RE-S-2000
CB 0              REV 14   750-031391   ZJ7749            Enhanced MX SCB
CB 1              REV 14   750-031391   ZJ7750            Enhanced MX SCB
CB 2              REV 14   750-031391   ZY9233            Enhanced MX SCB
FPC 0             REV 17   750-031089   YR7434            MPC Type 2 3D
  CPU
```

```
FPC 1            REV 11   750-037207   ZW9727          AS-MCC
  CPU            REV 04   711-038173   ZW4817          AS-MCC-PMB
  MIC 0          REV 01   750-037214   ZH3764          AS-MSC
    PIC 0                 BUILTIN      BUILTIN         AS-MSC
  MIC 1          REV 01   711-028408   JZ9200          AS-MXC
    PIC 2                 BUILTIN      BUILTIN         AS-MXC
FPC 4            REV 30   750-028467   ABBN0232        MPC 3D 16x 10GE
  CPU
FPC 5            REV 04   750-037207   ZK9074          AS-MCC
  CPU
Fan Tray 0       REV 05   740-014971   VT5683          Fan Tray
Fan Tray 1       REV 05   740-014971   VT5684          Fan Tray
```

show chassis hardware extensive (MX240, MX480, MX960 routers with Application Services Modular Line Card)

```
user@host> show chassis hardware extensive

ID: AS-MCC                      FRU Model Number:  750-037207
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 37 01 0b 52 45 56 20 31 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 30 37 00 00
  Address 0x20: 53 2f 4e 20 5a 57 39 37 32 37 00 00 00 11 02 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
  Address 0x50: 35 30 2d 30 33 37 32 30 37 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 31 31 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 5e ff ff ff ff ff ff ff ff ff ff ff ff
  CPU            REV 04   711-038173   ZW4817          AS-MCC-PMB
 Jedec Code:   0x7fb0          EEPROM Version:    0x02
 P/N:          711-038173      S/N:               ZW4817
 Assembly ID:  0x0b38          Assembly Version:  01.04
 Date:         12-30-2011      Assembly Flags:    0x00
 Version:      REV 04
 ID: AS-MCC-PMB
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 38 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 38 31 37 33 00 00
  Address 0x20: 53 2f 4e 20 5a 57 34 38 31 37 00 00 00 1e 0c 07
  Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 37
  Address 0x50: 31 31 2d 30 33 38 31 37 33 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 30 34 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 60 00 00 00 00 00 00 00 00 00 00 00 00
  MIC 0          REV 01   750-037214   ZH3764          AS-MSC
 Jedec Code:   0x7fb0          EEPROM Version:    0x02
 P/N:          750-037214      S/N:               ZH3764
 Assembly ID:  0x0a44          Assembly Version:  01.01
 Date:         07-04-2011      Assembly Flags:    0x00
 Version:      REV 01
 ID: AS-MSC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0a 44 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 34 00 00
  Address 0x20: 53 2f 4e 20 5a 48 33 37 36 34 00 00 00 04 07 07
  Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
```



```
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff f6 c0 03 e1 bc 00 00 00 00 00 00 00 00
    PIC 0                 BUILTIN      BUILTIN           AS-MSC
FPC 4            REV 30   750-028467   ABBN0232          MPC 3D 16x 10GE
 Jedec Code:   0x7fb0          EEPROM Version:    0x01
```

show chassis hardware (MX480 Router with MPC4E)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN10FF57BAFB      MX480
Midplane         REV 05   750-047849   Good              MX480 Midplane
FPM Board        REV 02   710-017254   KG2066            Front Panel Display
PEM 0            Rev 03   740-017330   QCS081590BJ       PS 1.2-1.7kW; 100-240V
AC in
PEM 1            Rev 03   740-017330   QCS0815908Z       PS 1.2-1.7kW; 100-240V
AC in
PEM 2            Rev 03   740-029970   QCS1001U001       PS 1.4-2.52kW; 90-264V
AC in
Routing Engine 0 REV 05   740-031116   9009089502        RE-S-1800x4
Routing Engine 1 REV 05   740-031116   9009089624        RE-S-1800x4
CB 0             REV 02   750-031391   YE8506            Enhanced MX SCB
CB 1             REV 14   750-031391   ZK8265            Enhanced MX SCB
FPC 2            REV 05   750-037358   ZT0638            MPC4E 3D 32XGE
  CPU            REV 07   711-035209   ZK3187            HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           8X10GE SFPP
  PIC 1                   BUILTIN      BUILTIN           8X10GE SFPP
  PIC 2                   BUILTIN      BUILTIN           8X10GE SFPP
  PIC 3                   BUILTIN      BUILTIN           8X10GE SFPP
FPC 3            REV 06   750-037355   CAAB1144          MPC4E 3D 2CGE+8XGE
  CPU            REV 08   711-035209   CAAB1278          HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-031980   B11E01439         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11D05809         SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0                NON-JNPR     D5418             UNKNOWN
  PIC 2                   BUILTIN      BUILTIN           4x10GE SFPP
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0                NON-JNPR     X12J00362         CFP-100G-SR10
FPC 4            REV 12.3.10 750-033205 YR9445           MPCE Type 3 3D
  CPU
Fan Tray                                                 Enhanced Left Fan Tray
```

show chassis hardware (MX2020 Router with MPC4E)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11E188CAFJ      MX2020
Midplane         REV 04   711-032387   ABAC7474          Lower Backplane
Midplane 1       REV 04   711-032386   ABAC7408          Upper Backplane
PMP 1            REV 03   711-032428   ACAJ1137          Upper Power Midplane
PMP 0            REV 03   711-032426   ACAJ1016          Lower Power Midplane
FPM Board        REV 06   760-040242   ABBT8832          Front Panel Display
PSM 3            REV 0C   740-033727   VK00255           DC 52V Power Supply
Module
PSM 4            REV 0C   740-033727   VJ00148           DC 52V Power Supply
Module
PSM 5            REV 0C   740-033727   VK00207           DC 52V Power Supply
```

```
Module
PSM 6            REV 0C   740-033727   VK00319          DC 52V Power Supply
Module
PSM 7            REV 0C   740-033727   VK00264          DC 52V Power Supply
Module
PSM 8            REV 0B   740-033727   VG00025          DC 52V Power Supply
Module
PSM 13           REV 0C   740-033727   VK00274          DC 52V Power Supply
Module
PSM 14           REV 0C   740-033727   VJ00167          DC 52V Power Supply
Module
PSM 15           REV 0C   740-033727   VK00299          DC 52V Power Supply
Module
PSM 16           REV 0C   740-033727   VK00213          DC 52V Power Supply
Module
PSM 17           REV 0C   740-033727   VK00253          DC 52V Power Supply
Module
PDM 0            REV 0B   740-038109   VJ00040          DC Power Dist Module
PDM 2            REV 0B   740-038109   VJ00025          DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009089735       RE-S-1800x4
Routing Engine 1 REV 02   740-041821   9009089731       RE-S-1800x4
CB 0             REV 04   750-040257   ZT2846           Control Board
CB 1             REV 04   750-040257   ZT2877           Control Board
SPMB 0           REV 01   711-041855   ZS2282           PMB Board
SPMB 1           REV 01   711-041855   ZS2261           PMB Board
SFB 0            REV 07   711-032385   ZZ2582           Switch Fabric Board
SFB 1            REV 04   711-032385   ZV4229           Switch Fabric Board
SFB 2            REV 07   711-032385   CAAB4902         Switch Fabric Board
SFB 3            REV 07   711-032385   CAAB4891         Switch Fabric Board
SFB 4            REV 07   711-032385   CAAB4883         Switch Fabric Board
SFB 5            REV 07   711-032385   CAAB4889         Switch Fabric Board
SFB 6            REV 06   711-032385   ZV1818           Switch Fabric Board
SFB 7            REV 07   711-032385   CAAB4897         Switch Fabric Board
FPC 0            REV 34   750-031090   ZT9799           MPC Type 2 3D EQ
  CPU            REV 06   711-030884   ZS1122           MPC PMB 2G
  MIC 0          REV 11   750-033535   CAAD7674         MIC-3D-1OC192-XFP
    PIC 0                 BUILTIN      BUILTIN          MIC-3D-1OC192-XFP
      Xcvr 0     REV 01   740-014279   753019A00404     XFP-OC192-SR
  MIC 1          REV 14   750-031967   ZM6103           MIC-3D-8OC3OC12-4OC48
    PIC 2                 BUILTIN      BUILTIN          MIC-3D-8OC3OC12-4OC48
      Xcvr 0     REV 01   740-011615   PEF1AZP          SFP-IR
      Xcvr 1     REV 01   740-011615   PEF1AZN          SFP-IR
      Xcvr 2     REV 01   740-021308   ANA0N8S          SFP+-10G-SR
  QXM 0          REV 06   711-028408   ZT9339           MPC QXM
  QXM 1          REV 06   711-028408   ZT9237           MPC QXM
FPC 9            REV 34   750-031090   ZT9770           MPC Type 2 3D EQ
  CPU            REV 06   711-030884   ZS1302           MPC PMB 2G
  MIC 0          REV 24   750-028387   YJ3950           3D 4x 10GE  XFP
    PIC 0                 BUILTIN      BUILTIN          2x 10GE  XFP
      Xcvr 0              NON-JNPR     T09M52516        XFP-10G-SR
      Xcvr 1              NON-JNPR     CA49BK095        XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN          2x 10GE  XFP
      Xcvr 0     REV 02   740-014289   C834XU01T        XFP-10G-SR
      Xcvr 1              NON-JNPR     T09M52515        XFP-10G-SR
  MIC 1          REV 11   750-033535   CAAD7681         MIC-3D-1OC192-XFP
    PIC 2                 BUILTIN      BUILTIN          MIC-3D-1OC192-XFP
      Xcvr 0     REV 01   740-014279   KBQ02BE          XFP-OC192-SR
  QXM 0          REV 06   711-028408   ZT9151           MPC QXM
  QXM 1          REV 06   711-028408   ZT9116           MPC QXM
FPC 10           REV 27   750-033205   ZL6215           MPCE Type 3 3D
  CPU            REV 07   711-035209   ZK9038           HMPC PMB 2G
```



```
  MIC 0          REV 18   750-028380   YG6885            3D 2x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN           1x 10GE XFP
      Xcvr 0     REV 01   740-014289   C706XU0AG         XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN           1x 10GE XFP
      Xcvr 0     REV 02   740-014289   T08L84366         XFP-10G-SR
FPC 14           REV 09   750-037355   CAAF1534          MPC4E 3D 2CGE+8XGE
  CPU            REV 08   711-035209   CAAB9879          HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   21T511100436      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AHP0GPM           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   123363A00032      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   19T511100477      SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0                NON-JNPR     X12J00260         CFP-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   21T511104086      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   21T511104627      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   21T511104644      SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP
FPC 19           REV 32   750-028467   ZR2008            MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ZT6933            AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   19T511100291      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AMH02VE           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   23T511102128      SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AMS15PP           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   123363A00716      SFP+-10G-SR
ADC 0            REV 05   750-043596   CAAC2072          Adapter Card
ADC 9            REV 01   750-043596   ZV4111            Adapter Card
ADC 10           REV 05   750-043596   CAAC2058          Adapter Card
ADC 14           REV 02   750-043596   ZW1561            Adapter Card
ADC 19           REV 01   750-043596   ZV4127            Adapter Card
Fan Tray 0       REV 03   760-046960   ACAY0124          172mm FanTray - 6 Fans
Fan Tray 1       REV 2A   760-046960   ACAY0022          172mm FanTray - 6 Fans
Fan Tray 2       REV 2A   760-046960   ACAY0023          172mm FanTray - 6 Fans
Fan Tray 3       REV 2A   760-046960   ACAY0025          172mm FanTray - 6 Fans
```

show chassis hardware (MX5, MX10, MX40, MX80, MX240, MX480, and MX960 routers with Enhanced 20-port Gigabit Ethernet MIC)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                F3434             MX80-P
Midplane         REV 01   711-044315   ZK2681            MX80-P
PEM 0            Rev 04   740-028288   VE05267           AC Power Entry Module
PEM 1            Rev 04   740-028288   VE05270           AC Power Entry Module
Routing Engine            BUILTIN      BUILTIN           Routing Engine
TFEB 0                    BUILTIN      BUILTIN           Forwarding Engine
Processor
  QXM 0          REV 05   711-028408   ZK0952            MPC QXM
FPC 0                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0                   BUILTIN      BUILTIN           4x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN           4x 10GE XFP
FPC 1                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0          REV 02   750-049846   CAAV2153          3D 20x 1GE(LAN)-E,SFP
    PIC 0                 BUILTIN      BUILTIN           10x 1GE(LAN) -E  SFP
      Xcvr 0     REV 01   740-011613   AM0816S9B81       SFP-SX
```

```
        Xcvr 1      REV 02    740-011613    AM0925SBLK7      SFP-SX
        Xcvr 2      REV 01    740-011613    UAQ0005          SFP-SX
        Xcvr 3      REV 01    740-011613    UAQ000C          SFP-SX
        Xcvr 4      REV 01    740-011613    P9F195E          SFP-SX
        Xcvr 5      REV 01    740-011613    UAQ0003          SFP-SX
        Xcvr 6      REV 01    740-031851    AM1041SU1LD      SFP-SX
        Xcvr 8      REV 02    740-013111    B101501          SFP-T
      PIC 1                   BUILTIN       BUILTIN          10x 1GE(LAN) -E  SFP
        Xcvr 0      REV 01    740-011613    PFM1ML7          SFP-SX
        Xcvr 4      REV 01    740-011613    PE729P6          SFP-SX
        Xcvr 6      REV 02    740-011613    AM1014SGC84      SFP-SX
        Xcvr 9      REV 01    740-011613    AM0812S8UK3      SFP-SX
    MIC 1           REV 26    750-028392    ZY0187           3D 20x 1GE(LAN) SFP
      PIC 2                   BUILTIN       BUILTIN          10x 1GE(LAN) SFP
        Xcvr 0      REV 01    740-011613    P9F1AN9          SFP-SX
        Xcvr 5      REV 02    740-011613    AM1003SFUF4      SFP-SX
        Xcvr 9      REV 01    740-031851    AM1041SU1LM      SFP-SX
      PIC 3                   BUILTIN       BUILTIN          10x 1GE(LAN) SFP
        Xcvr 4      REV 01    740-011613    PAJ4MYT          SFP-SX
        Xcvr 7      +         NON-JNPR      XG32A024         SFP-SX
        Xcvr 8                NON-JNPR      PFR0V6J          SFP-SX
        Xcvr 9      REV 01    740-031851    AM1041SU02U      SFP-SX
Fan Tray
```

show chassis hardware models (MX5, MX10, MX40, MX80, MX240, MX480, and MX960 routers with Enhanced 20-port Gigabit Ethernet MIC)

```
user@host> show chassis hardware models
Hardware inventory:
Item                Version   Part number   Serial number    FRU model number
PEM 0               Rev 04    740-028288    VE05267          PWR-MX80-AC-S
PEM 1               Rev 04    740-028288    VE05270          PWR-MX80-AC-S
Routing Engine                BUILTIN       BUILTIN
TFEB 0                        BUILTIN       BUILTIN
FPC 0                         BUILTIN       BUILTIN
FPC 1                         BUILTIN       BUILTIN
  MIC 0             REV 02    750-049846    CAAV2153         MIC-3D-20GE-SFP-E
  MIC 1             REV 26    750-028392    ZY0187           MIC-3D-20GE-SFP
Fan Tray                                                     FANTRAY-MX80-S
```

show chassis hardware (T320 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item                Version   Part number   Serial number    Description
Chassis                                     19093            T320
Midplane            REV 04    710-004339    BC1436           T320 Backplane
FPM GBUS            REV 03    710-004461    BC1407           T320 FPM Board
FPM Display         REV 04    710-002897    BE0763           FPM Display
CIP                 REV 05    710-002895    BB2311           T Series CIP
PEM 0               Rev 01    740-004359    NB12546          Power Entry Module
SCG 0               REV 06    710-004455    AY4522           T320 Sonet
Clock Gen.
Routing Engine 0                                             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:               AX5633.
  Assembly ID:   0x0127            Assembly Version:  01.04
  Date:          06-27-2001        Assembly Flags:    0x00
  Version:       REV 04.....
  ID: Gibson Backplane
  Board Information Record:
   Address 0x00: ad 01 08 00 00 90 69 0e f8 00 ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 01 ff 01 27 01 04 52 45 56 20 30 34 00 00
   Address 0x10: 00 00 00 00 37 31 30 2d 30 30 32 37 32 36 00 00
   Address 0x20: 53 2f 4e 20 41 58 35 36 33 33 00 00 00 1b 06 07
   Address 0x30: d1 ff ff ff ad 01 08 00 00 90 69 0e f8 00 ff ff
   Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM GBUS         REV 02   710-002901   HE3245
 ...
FPM Display      REV 02   710-002897   HA4873
 ...
CIP              REV 05   710-002895   HA4729
...
PEM 1            RevX02   740-002595   MD21815          Power Entry Module
 ...
SCG 0            REV 04   710-003423   HF6023
 ...
SCG 1            REV 04   710-003423   HF6061
 ...
Routing Engine 0 REV 01   740-005022   210865700292     RE-3.0
...
CB 0             REV 06   710-002728   HE3614
...
FPC 1            REV 01   710-002385   HE3009           FPC Type 1
...              REV 06   710-001726   HC0010
```

show chassis hardware (T4000 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN1172F25AHA     T4000
Midplane         REV 01   710-027486   RC8355           T-series Backplane
FPM GBUS         REV 13   710-002901   BBAE0927         T640 FPM Board
FPM Display      REV 01   710-021387   EF6764           T1600 FPM Display
CIP              REV 06   710-002895   BBAD9210         T-series CIP
PEM 0            REV 01   740-036442   VA00016          Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAD7248         T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAE3874         T640 Sonet Clock Gen.
Routing Engine 0 REV 05   740-026941   P737F-002248     RE-DUO-1800
Routing Engine 1 REV 06   740-026941   P737F-002653     RE-DUO-1800
CB 0             REV 09   710-022597   ED0295           LCC Control Board
CB 1             REV 09   710-022597   EA6050           LCC Control Board
FPC 0            REV 26   750-032819   EK1173           FPC Type 5-3D
```

```
  CPU            REV 12   711-030686   EJ8584           SNG PMB
  PIC 0          REV 07   750-034624   EF6837           12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   123363A01145     SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   123363A01147     SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01P3          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B10M03256        SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJJ01M2          SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   123363A01137     SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01PN          SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AJJ01NW          SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   123363A01139     SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJJ01KE          SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   123363A01336     SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B10M01325        SFP+-10G-SR
  PIC 1          REV 07   750-034624   EF6800           12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   AJJ01SA          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJJ01QZ          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJH0217          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AJJ01TE          SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJJ01KV          SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   AJJ01MU          SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01R0          SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AJJ01TC          SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AJJ0364          SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJD0GV3          SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   B10M03343        SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AJJ01QJ          SFP+-10G-SR
  LMB 0          REV 05   711-034381   EJ8490           Type-0 LMB
  LMB 1          REV 04   711-035774   EJ8517           Type-1 LMB
  LMB 2          REV 05   711-034381   EJ8489           Type-0 LMB
FPC 3            REV 07   750-032819   EG3637           FPC Type 5-3D
  CPU            REV 09   711-030686   EG0150           SNG PMB
  PIC 0          REV 08   750-035293   EF3657           1x100GE
    Xcvr 0       REV 01   740-032210   C22CQNJ          CFP-100G-LR4
  PIC 1          REV 10   750-034624   BBAN4098         12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   B11J04902        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11J04891        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01MX          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11J04183        SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   B11J04894        SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   B11J04184        SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11J04897        SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11J04899        SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AJJ01TV          SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   B11J04057        SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   AJJ01M4          SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B11J04905        SFP+-10G-SR
  LMB 0          REV 04   711-034381   EG1524           Type-0 LMB
  LMB 1          REV 03   711-035774   EG0345           Type-1 LMB
  LMB 2          REV 04   711-034381   EG1522           Type-0 LMB
FPC 5            REV 03   710-033871   BBAJ0768         FPC Type 4-ES
  CPU            REV 11   710-016744   BBAH9342         ST-PMB2
  PIC 0          REV 09   750-029262   EE6789           100GE
  PIC 1          REV 03   750-034781   EE6655           100GE CFP
    Xcvr 0       REV 01   740-032210   J11A22334        CFP-100G-LR4
  BRIDGE 0       REV 03   711-029995   EE6572           100GE Bridge Board
  MMB 0          REV 07   710-025563   BBAJ4657         ST-MMB2
  MMB 1          REV 07   710-025563   BBAJ3073         ST-MMB2
FPC 6            REV 05   750-010153   EF4936           FPC Type 5-3D
  CPU            REV 06   711-030686   EF4189           SNG PMB
  PIC 0          REV 10   750-034624   BBAN4109         12x10GE (LAN/WAN) SFPP
```



```
    Xcvr 0        REV 01   740-031980   B11J04895        SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   B11J04898        SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   B11J04021        SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   B11J04903        SFP+-10G-SR
    Xcvr 4        REV 01   740-031980   B11J04311        SFP+-10G-SR
    Xcvr 5        REV 01   740-031980   B11J04059        SFP+-10G-SR
    Xcvr 6        REV 01   740-031980   B11J04016        SFP+-10G-SR
    Xcvr 7        REV 01   740-031980   B11J04017        SFP+-10G-SR
    Xcvr 8        REV 01   740-031980   B11J04887        SFP+-10G-SR
    Xcvr 9        REV 01   740-031980   B11J04297        SFP+-10G-SR
    Xcvr 10       REV 01   740-031980   B11J04893        SFP+-10G-SR
    Xcvr 11       REV 01   740-031980   B11J04022        SFP+-10G-SR
  PIC 1           REV 02   750-034624   EE3711           12x10GE (LAN/WAN) SFPP
    Xcvr 0        REV 01   740-031980   AJH033X          SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   AJJ01N0          SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AJJ01SV          SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   AJJ032L          SFP+-10G-SR
    Xcvr 4        REV 01   740-031980   B10M01593        SFP+-10G-SR
    Xcvr 5        REV 01   740-031980   AJD0FF1          SFP+-10G-SR
    Xcvr 6        REV 01   740-031980   AJJ01NU          SFP+-10G-SR
    Xcvr 7        REV 01   740-031980   123363A01305     SFP+-10G-SR
    Xcvr 8        REV 01   740-031980   B10M00361        SFP+-10G-SR
    Xcvr 9        REV 01   740-031980   AJJ01M7          SFP+-10G-SR
    Xcvr 10       REV 01   740-031980   AJJ032X          SFP+-10G-SR
    Xcvr 11       REV 01   740-031980   AJJ01PG          SFP+-10G-SR
  LMB 0           REV 04   711-034381   EF3838           Type-0 LMB
  LMB 1           REV 03   711-035774   EF3821           Type-1 LMB
  LMB 2           REV 04   711-034381   EF3834           Type-0 LMB
SPMB 0            REV 05   710-023321   ED1990           LCC Switch CPU
SPMB 1            REV 05   710-023321   EA2768           LCC Switch CPU
SIB 0             REV 02   711-036340   EF8802           SIB-HC-3D
SIB 1             REV 07   711-036340   EG2286           SIB-HC-3D
SIB 2             REV 07   711-036340   EG2252           SIB-HC-3D
SIB 3             REV 02   711-036340   EF1358           SIB-HC-3D
SIB 4             REV 02   711-036340   EF8806           SIB-HC-3D
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
-- Rev 2
Fan Tray 2                                               Rear Fan Tray -- Rev 3
```

show chassis hardware (T4000 Router with 16 GB line card chassis (LCC) Routing Engine)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number    Description
Chassis                                 JN11BDF2CAHA     T1600
Midplane          REV 01   710-027486   ACAJ0774         T640 Backplane
FPM GBUS          REV 13   710-002901   BBAL6812         T640 FPM Board
FPM Display       REV 04   710-021387   BBAP2679         T1600 FPM Display
CIP               REV 06   710-002895   BBAP4758         T-series CIP
PEM 0             Rev 03   740-026384   XF86421          Power Entry Module 3x80
PEM 1             Rev 03   740-026384   XF86429          Power Entry Module 3x80
SCG 0             REV 18   710-003423   BBAP1896         T640 Sonet Clock Gen.
SCG 1             REV 18   710-003423   BBAN8659         T640 Sonet Clock Gen.
Routing Engine 0  REV 01   740-042243   737F-002238      RE-DUO-1800-16G
Routing Engine 1  REV 01   740-042243   737F-002403      RE-DUO-1800-16G
CB 1              REV 11   710-022597   EK4526           LCC Control Board
CB 1              REV 11   710-022597   EK4527           LCC Control Board
FPC 0             REV 05   710-033871   EK5644           FPC Type 4-ES
  CPU             REV 11   710-016744   EK3428           ST-PMB2
  PIC 0           REV 20   750-017405   EJ3041           4x 10GE (LAN/WAN) XFP
```

```
  PIC 1          REV 17   750-026962   EH7536          10x10GE(LAN/WAN) SFPP
  MMB 0          REV 07   710-025563   EK6039          ST-MMB2
  MMB 1          REV 07   710-025563   EK6086          ST-MMB2
FPC 1            REV 05   710-033871   EK6583          FPC Type 4-ES
  CPU            REV 11   710-016744   EK3401          ST-PMB2
  PIC 0          REV 17   750-026962   EJ8948          10x10GE(LAN/WAN) SFPP
  MMB 0          REV 07   710-025563   EK6202          ST-MMB2
  MMB 1          REV 07   710-025563   EK6112          ST-MMB2
SPMB 1           REV 05   710-023321   EK4900          LCC Switch CPU
SIB 0            REV 11   710-013074   EK5958          SIB-I8-SF
SIB 1            REV 11   710-013074   EK4606          SIB-I8-SF
SIB 2            REV 11   710-013074   EK5971          SIB-I8-SF
SIB 3            REV 11   710-013074   EK4609          SIB-I8-SF
SIB 4            REV 11   710-013074   EK4602          SIB-I8-SF
Fan Tray 0                                             Front Top Fan Tray
Fan Tray 1                                             Front Bottom Fan Tray
Fan Tray 2                                             Rear Fan Tray -- Rev 2
```

show chassis hardware (T4000 Router with LSR FPC)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number   Description
Chassis                                JN1173A24AHA    T4000
FPC 3            REV      750-048373   AN7797          FPC Type 5-LSR
  CPU            REV 10   711-030686   AN6649          SNG PMB
  PIC 0          REV 07   750-034624   EF6830          12x10GE (LAN/WAN) SFPP
```

show chassis hardware clei-models (T4000 Router)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code       FRU model number
Midplane         REV 01   710-027486   IPMJ700DRD      CHAS-BP-T1600-S
FPM Display      REV 01   710-021387                   CRAFT-T1600-S
CIP              REV 06   710-002895                   CIP-L-T640-S
PEM 0            REV 01   740-036442   IPUPAG6KAA      PWR-T-6-60-DC
SCG 0            REV 18   710-003423                   SCG-T-S
SCG 1            REV 18   710-003423                   SCG-T-S
Routing Engine 0 REV 05   740-026941                   RE-DUO-C1800-8G-S
Routing Engine 1 REV 06   740-026941                   RE-DUO-C1800-8G-S
CB 0             REV 09   710-022597                   CB-LCC-S
CB 1             REV 09   710-022597                   CB-LCC-S
FPC 3
  PIC 0          REV 08   750-035293   XXXXXXXXBB      PF-1CGE-CFP
  PIC 1          REV 10   750-034624   XXXXXXXXCC      PF-12XGE-SFPP
FPC 5            REV 03   710-033871   IPUCAMBCTD      T1600-FPC4-ES
  PIC 1          REV 03   750-034781   IPUIBKLMAA      PD-1CE-CFP-FPC4
FPC 6
  PIC 0          REV 10   750-034624   XXXXXXXXCC      PF-12XGE-SFPP
Fan Tray 0                                             FANTRAY-T-S
Fan Tray 1                                             FANTRAY-T4000-S
Fan Tray 2                                             FANTRAY-TXP-R-S
```

show chassis hardware detail (T4000 Router)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number   Description
Chassis                                JN1172F25AHA    T4000
Midplane         REV 01   710-027486   RC8355          T-series Backplane
FPM GBUS         REV 13   710-002901   BBAE0927        T640 FPM Board
```

```
FPM Display      REV 01   710-021387   EF6764           T1600 FPM Display
CIP              REV 06   710-002895   BBAD9210         T-series CIP
PEM 0            REV 01   740-036442   VA00016          Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAD7248         T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAE3874         T640 Sonet Clock Gen.
Routing Engine 0 REV 05   740-026941   P737F-002248     RE-DUO-1800
  ad0    3823 MB  SMART CF             2009121602A661576157 Compact Flash
  ad1   59690 MB  STEC MACH-8 SSD      STM000103FDB     Disk 1
Routing Engine 1 REV 06   740-026941   P737F-002653     RE-DUO-1800
  ad0    3823 MB  SMART CF             201011150153F52CF52C Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 2010110900150A880A88 Disk 1
CB 0             REV 09   710-022597   ED0295           LCC Control Board
CB 1             REV 09   710-022597   EA6050           LCC Control Board
FPC 0            REV 26   750-032819   EK1173           FPC Type 5-3D
  CPU            REV 12   711-030686   EJ8584           SNG PMB
  PIC 0          REV 07   750-034624   EF6837           12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   123363A01145     SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   123363A01147     SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01P3          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B10M03256        SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJJ01M2          SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   123363A01137     SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01PN          SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AJJ01NW          SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   123363A01139     SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJJ01KE          SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   123363A01336     SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B10M01325        SFP+-10G-SR
  PIC 1          REV 07   750-034624   EF6800           12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   AJJ01SA          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJJ01QZ          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJH0217          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AJJ01TE          SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJJ01KV          SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   AJJ01MU          SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01R0          SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AJJ01TC          SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AJJ0364          SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJD0GV3          SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   B10M03343        SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AJJ01QJ          SFP+-10G-SR
  LMB 0          REV 05   711-034381   EJ8490           Type-0 LMB
  LMB 1          REV 04   711-035774   EJ8517           Type-1 LMB
  LMB 2          REV 05   711-034381   EJ8489           Type-0 LMB
FPC 3            REV 07   750-032819   EG3637           FPC Type 5-3D
  CPU            REV 09   711-030686   EG0150           SNG PMB
  PIC 0          REV 08   750-035293   EF3657           1x100GE
    Xcvr 0       REV 01   740-032210   C22CQNJ          CFP-100G-LR4
  PIC 1          REV 10   750-034624   BBAN4098         12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   B11J04902        SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11J04891        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01MX          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11J04183        SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   B11J04894        SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   B11J04184        SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11J04897        SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11J04899        SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AJJ01TV          SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   B11J04057        SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   AJJ01M4          SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B11J04905        SFP+-10G-SR
```

```
  LMB 0            REV 04   711-034381   EG1524           Type-0 LMB
  LMB 1            REV 03   711-035774   EG0345           Type-1 LMB
  LMB 2            REV 04   711-034381   EG1522           Type-0 LMB
FPC 5              REV 03   710-033871   BBAJ0768         FPC Type 4-ES
  CPU              REV 11   710-016744   BBAH9342         ST-PMB2
  PIC 0            REV 09   750-029262   EE6789           100GE
  PIC 1            REV 03   750-034781   EE6655           100GE CFP
    Xcvr 0         REV 01   740-032210   J11A22334        CFP-100G-LR4
  BRIDGE 0         REV 03   711-029995   EE6572           100GE Bridge Board
  MMB 0            REV 07   710-025563   BBAJ4657         ST-MMB2
  MMB 1            REV 07   710-025563   BBAJ3073         ST-MMB2
FPC 6              REV 05   750-010153   EF4936           FPC Type 5-3D
  CPU              REV 06   711-030686   EF4189           SNG PMB
  PIC 0            REV 10   750-034624   BBAN4109         12x10GE (LAN/WAN) SFPP
    Xcvr 0         REV 01   740-031980   B11J04895        SFP+-10G-SR
    Xcvr 1         REV 01   740-031980   B11J04898        SFP+-10G-SR
    Xcvr 2         REV 01   740-031980   B11J04021        SFP+-10G-SR
    Xcvr 3         REV 01   740-031980   B11J04903        SFP+-10G-SR
    Xcvr 4         REV 01   740-031980   B11J04311        SFP+-10G-SR
    Xcvr 5         REV 01   740-031980   B11J04059        SFP+-10G-SR
    Xcvr 6         REV 01   740-031980   B11J04016        SFP+-10G-SR
    Xcvr 7         REV 01   740-031980   B11J04017        SFP+-10G-SR
    Xcvr 8         REV 01   740-031980   B11J04887        SFP+-10G-SR
    Xcvr 9         REV 01   740-031980   B11J04297        SFP+-10G-SR
    Xcvr 10        REV 01   740-031980   B11J04893        SFP+-10G-SR
    Xcvr 11        REV 01   740-031980   B11J04022        SFP+-10G-SR
  PIC 1            REV 02   750-034624   EE3711           12x10GE (LAN/WAN) SFPP
    Xcvr 0         REV 01   740-031980   AJH033X          SFP+-10G-SR
    Xcvr 1         REV 01   740-031980   AJJ01N0          SFP+-10G-SR
    Xcvr 2         REV 01   740-031980   AJJ01SV          SFP+-10G-SR
    Xcvr 3         REV 01   740-031980   AJJ032L          SFP+-10G-SR
    Xcvr 4         REV 01   740-031980   B10M01593        SFP+-10G-SR
    Xcvr 5         REV 01   740-031980   AJD0FF1          SFP+-10G-SR
    Xcvr 6         REV 01   740-031980   AJJ01NU          SFP+-10G-SR
    Xcvr 7         REV 01   740-031980   123363A01305     SFP+-10G-SR
    Xcvr 8         REV 01   740-031980   B10M00361        SFP+-10G-SR
    Xcvr 9         REV 01   740-031980   AJJ01M7          SFP+-10G-SR
    Xcvr 10        REV 01   740-031980   AJJ032X          SFP+-10G-SR
    Xcvr 11        REV 01   740-031980   AJJ01PG          SFP+-10G-SR
  LMB 0            REV 04   711-034381   EF3838           Type-0 LMB
  LMB 1            REV 03   711-035774   EF3821           Type-1 LMB
  LMB 2            REV 04   711-034381   EF3834           Type-0 LMB
SPMB 0             REV 05   710-023321   ED1990           LCC Switch CPU
SPMB 1             REV 05   710-023321   EA2768           LCC Switch CPU
SIB 0              REV 02   711-036340   EF8802           SIB-HC-3D
SIB 1              REV 07   711-036340   EG2286           SIB-HC-3D
SIB 2              REV 07   711-036340   EG2252           SIB-HC-3D
SIB 3              REV 02   711-036340   EF1358           SIB-HC-3D
SIB 4              REV 02   711-036340   EF8806           SIB-HC-3D
Fan Tray 0                                                Front Top Fan Tray
Fan Tray 1                                                Front Bottom Fan Tray
-- Rev 2
Fan Tray 2                                                Rear Fan Tray -- Rev 3
```

show chassis hardware models (T4000 Router)

user@host> **show chassis hardware models**

```
Hardware inventory:
Item               Version  Part number  Serial number    FRU model number
Midplane           REV 01   710-027486   RC8355           CHAS-BP-T1600-S
```



```
FPM Display       REV 01   710-021387   EF6764           CRAFT-T1600-S
CIP               REV 06   710-002895   BBAD9210         CIP-L-T640-S
PEM 0             REV 01   740-036442   VA00016          PWR-T-6-60-DC
SCG 0             REV 18   710-003423   BBAD7248         SCG-T-S
SCG 1             REV 18   710-003423   BBAE3874         SCG-T-S
Routing Engine 0  REV 05   740-026941   P737F-002248     RE-DUO-C1800-8G-S
Routing Engine 1  REV 06   740-026941   P737F-002653     RE-DUO-C1800-8G-S
CB 0              REV 09   710-022597   ED0295           CB-LCC-S
CB 1              REV 09   710-022597   EA6050           CB-LCC-S
FPC 3
  PIC 0           REV 08   750-035293   EF3657           PF-1CGE-CFP
  PIC 1           REV 10   750-034624   BBAN4098         PF-12XGE-SFPP
FPC 5             REV 03   710-033871   BBAJ0768         T1600-FPC4-ES
  PIC 1           REV 03   750-034781   EE6655           PD-1CE-CFP-FPC4
FPC 6
  PIC 0           REV 10   750-034624   BBAN4109         PF-12XGE-SFPP
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T4000-S
Fan Tray 2                                               FAN-REAR-TXP-LCC
```

show chassis hardware lcc (TX Matrix Router)

```
user@host> show chassis hardware lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item              Version  Part number  Serial number    Description
Chassis                                 65751            T640
Midplane          REV 03   710-005608   RA1408           T640 Backplane
FPM GBUS          REV 09   710-002901   RA2784           T640 FPM Board
FPM Display       REV 05   710-002897   RA2825           FPM Display
CIP               REV 06   710-002895   HT0684           T Series CIP
PEM 0             Rev 11   740-002595   PM18483          Power Entry Module
PEM 1             Rev 11   740-002595   qb13984          Power Entry Module
SCG 0             REV 11   710-003423   HT0022           T640 Sonet Clock Gen.
Routing Engine 0  REV 13   740-005022   210865700363     RE-3.0 (RE-600)
CB 0              REV 03   710-007655   HW1195           Control Board (CB-T)
FPC 1             REV 05   710-007527   HM3245           FPC Type 2
  CPU             REV 14   710-001726   HM1084           FPC CPU
  PIC 0           REV 02   750-007218   AZ1112           2x OC-12 ATM2 IQ, SMIR
  PIC 1           REV 02   750-007745   HG3462           4x OC-3 SONET, SMIR
  PIC 2           REV 14   750-001901   BA5390           4x OC-12 SONET, SMIR
  PIC 3           REV 09   750-008155   HS3012           2x G/E IQ, 1000 BASE
    SFP 0                  NON-JNPR     P1186TY          SFP-S
    SFP 1         REV 01   740-007326   P11WLTF          SFP-SX
  MMB 1           REV 02   710-005555   HL7514           MMB-288mbit
  PPB 0           REV 04   710-003758   HM4405           PPB Type 2
  PPB 1           REV 04   710-003758   AV1960           PPB Type 2
FPC 2             REV 08   710-010154   HZ3578           E-FPC Type 3
  CPU             REV 05   710-010169   HZ3219           FPC CPU-Enhanced
  PIC 0           REV 02   750-009567   HX2882           1x 10GE(LAN),XENPAK
    SFP 0         REV 01   740-009898   USC202U709       XENPAK-LR
  PIC 1           REV 03   750-003336   HJ9954           4x OC-48 SONET, SMSR
  PIC 2           REV 01   750-004535   HC0235           1x OC-192 SM SR1
  PIC 3           REV 07   750-007141   HX1699           10x 1GE(LAN), 1000 BASE

    SFP 0         REV 01   740-007326   2441042          SFP-SX
    SFP 1         REV 01   740-007326   2441027          SFP-SX
  MMB 0           REV 03   710-010171   HV2365           MMB-5M3-288mbit
  MMB 1           REV 03   710-010171   HZ3888           MMB-5M3-288mbit
SPMB 0            REV 09   710-003229   HW5245           T Series Switch CPU
```



```
SIB 3            REV 07   710-005781   HR5927           SIB-L8-F16
  B Board        REV 06   710-005782   HR5971           SIB-L8-F16 (B)
SIB 4            REV 07   710-005781   HR5903           SIB-L8-F16
  B Board        REV 06   710-005782   HZ5275           SIB-L8-F16 (B)
```

show chassis hardware scc (TX Matrix Router)

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user@host> show chassis hardware scc
scc-re0:
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Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                                 TX Matrix
Midplane         REV 04   710-004396   RB0014           SCC Midplane
FPM GBUS         REV 04   710-004617   HW9141           SCC FPM Board
FPM Display      REV 04   710-004619   HS5950           SCC FPM
CIP 0            REV 01   710-010218   HV9151           SCC CIP
CIP 1            REV 01   710-010218   HV9152           SCC CIP
PEM 1            Rev 11   740-002595   QB13977          Power Entry Module
Routing Engine 0 REV 05   740-008883   P11123900153     RE-4.0 (RE-1600)
CB 0             REV 01   710-011709   HR5964           Control Board (CB-TX)
SPMB 0           REV 09   710-003229   HW5293           T Series Switch CPU
SIB 3
SIB 4            REV 01   710-005839   HW1177           SIB-S8-F16
  B Board        REV 01   710-005840   HW1202           SIB-S8-F16 (B)
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show chassis hardware (T1600 Router)

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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
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  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
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    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
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show chassis hardware (TX Matrix Plus Router)

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user@host> show chassis hardware
sfc0-re0:
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Hardware inventory:
Item               Version  Part number  Serial number     Description
Chassis                                  JN113186EAHB      TXP
Midplane           REV 05   710-022574   TS3822            SFC Midplane
FPM Display        REV 03   710-024027   DW4701            TXP FPM Display
CIP 0              REV 05   710-023792   DW7998            TXP CIP
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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
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Fan Tray 1        REV 02   760-024497   DR8293            Front Fan Tray
Fan Tray 2        REV 05   760-024502   DR8280            Rear Fan Tray
Fan Tray 3
Fan Tray 4        REV 05   760-024502   DR8276            Rear Fan Tray
Fan Tray 5        REV 02   760-024502   DP5643            Rear Fan Tray

lcc0-re0:
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Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN11036F8AHA      T1600
Midplane          REV 03   710-017247   RC3799            T-series Backplane
FPM GBUS          REV 10   710-002901   DP7009            T640 FPM Board
FPM Display       REV 01   710-021387   DN7026            T1600 FPM Display
CIP               REV 06   710-002895   DP6024            T-series CIP
PEM 1            Rev 02   740-023211   WA50019           Power Entry Module 4x60A
SCG 0             REV 15   710-003423   DR6757            T640 Sonet Clock Gen.
SCG 1             REV 15   710-003423   DS2225            T640 Sonet Clock Gen.
Routing Engine 0 REV 01   740-026941   737F-1040         RE-DUO-1800
Routing Engine 1 REV 01   740-026941   737F-1016         RE-DUO-1800
CB 0              REV 06   710-022597   DX4011            LCC Control Board
CB 1              REV 06   710-022597   DX4017            LCC Control Board
FPC 1             REV 07   710-013035   DN5847            FPC Type 3-ES
  CPU             REV 08   710-016744   DP2570            ST-PMB2
  PIC 0           REV 05   750-015217   DB0418            8x 1GE(TYPE3), IQ2
    Xcvr 0        REV 01   740-011782   P8Q27ZG           SFP-SX
    Xcvr 1                 NON-JNPR     PDA1U0D           SFP-SX
    Xcvr 2        REV 01   740-011613   P9F1ALW           SFP-SX
    Xcvr 3        REV 01   740-011782   PBA403V           SFP-SX
    Xcvr 4                 NON-JNPR     PDE09DP           SFP-SX
    Xcvr 5        REV 01   740-011782   PCH2P4K           SFP-SX
    Xcvr 6        REV 01   740-011782   PB94K0F           SFP-SX
    Xcvr 7        REV 01   740-011782   PBA2R2A           SFP-SX
  PIC 1           REV 03   750-004424   HJ4020            1x 10GE(LAN),DWDM
  PIC 2           REV 01   750-003336   HG6073            4x OC-48 SONET, SMSR
  MMB 0           REV 04   710-016036   DP3401            ST-MMB2
FPC 3             REV 12   710-013037   DR1169            FPC Type 4-ES
  CPU             REV 08   710-016744   DP9429            ST-PMB2
  PIC 0           REV 02   750-010850   JA0332            1x OC-768 SONET SR
  MMB 0           REV 04   710-016036   DR0628            ST-MMB2
  MMB 1           REV 04   710-016036   DR0592            ST-MMB2
FPC 4             REV 05   710-021534   DR7350            FPC Type 1-ES
  CPU             REV 08   710-016744   DP8096            ST-PMB2
  PIC 0           REV 04   750-014627   DP9171            4x OC-3 1x OC-12 SFP
    Xcvr 0        REV 02   740-011615   PDE2RVR           SFP-SR
  PIC 1          REV 22   750-005634   DS5815           1x CHOC12 IQ SONET, SMIR

  PIC 2           REV 09   750-002911   CF4539            4x F/E, 100 BASE-TX
  PIC 3           REV 08   750-021652   DR2827            1x CHOC12 IQE SONET
    Xcvr 0                 NON-JNPR     8                 UNKNOWN
  MMB 0           REV 04   710-016036   DR0809            ST-MMB2
FPC 5             REV 07   710-007529   HS5608            FPC Type 3
  CPU             REV 15   710-001726   HX4351            FPC CPU
  PIC 0           REV 14   750-009567   WJ8961            1x 10GE(LAN),XENPAK
    Xcvr 0        REV 01   740-013170   J05K05961         XENPAK-LR
  PIC 1           REV 16   750-007141   JJ8146           10x 1GE(LAN), 1000 BASE

    Xcvr 1        REV 01   740-011613   P9F117T           SFP-SX
    Xcvr 2        REV 01   740-011782   PBA2VCL           SFP-SX
    Xcvr 3        REV 01   740-011782   PB83DRB           SFP-SX
    Xcvr 4        REV 01   740-011613   AM0812S8UP8       SFP-SX
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  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.
```

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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
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  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
```

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  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
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Fan Tray 4        REV 06    760-024502   DV7807            Rear Fan Tray
Fan Tray 5        REV 06    760-024502   DV7828            Rear Fan Tray
```

show chassis hardware extensive (TX Matrix Plus Router)

```
user@host> show chassis hardware extensive
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN112F007AHB      TXP
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
                                S/N:               JN112F007AHB
 Assembly ID:  0x052c           Assembly Version:  00.00
 Date:         00-00-0000       Assembly Flags:    0x00
 ID: TXP
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 2c 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 32 46 30 30 37 41 48 42 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane          REV 05    710-022574   TS4027            SFC Midplane
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          710-022574       S/N:               TS4027
 Assembly ID:  0x0962           Assembly Version:  01.05
 Date:         03-23-2009       Assembly Flags:    0x00
 Version:      REV 05
 ID: SFC Midplane
 Board Information Record:
  Address 0x00: ad 01 ff ff 00 1d b5 14 00 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 09 62 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 32 32 35 37 34 00 00
  Address 0x20: 53 2f 4e 20 54 53 34 30 32 37 00 00 00 17 03 07
  Address 0x30: d9 ff ff ff ad 01 ff ff 00 1d b5 14 00 00 ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Display       REV 03    710-024027   DX0282            TXP FPM Display
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          710-024027       S/N:               DX0282
 Assembly ID:  0x096c           Assembly Version:  01.03
 Date:         02-10-2009       Assembly Flags:    0x00
 Version:      REV 03
 ID: TXP FPM Display            FRU Model Number:  CRAFT-TXP
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 09 6c 01 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 32 34 30 32 37 00 00
  Address 0x20: 53 2f 4e 20 44 58 30 32 38 32 00 00 00 0a 02 07
  Address 0x30: d9 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
  Address 0x50: 52 41 46 54 2d 54 58 50 00 00 00 00 00 00 00 00
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```
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
CIP 0            REV 04   710-023792   DW4889           TXP CIP
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          710-023792       S/N:               DW4889
 Assembly ID:  0x0969           Assembly Version:  01.04
 Date:         01-26-2009       Assembly Flags:    0x00
 Version:      REV 04
 ID: TXP CIP                    FRU Model Number:  CIP-TXP
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

show chassis hardware clei-models (TX Matrix Plus Router)

```
user@host> show chassis hardware clei-models
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 05   710-022574                     CHAS-BP-TXP-S
FPM Display      REV 03   710-024027                     CRAFT-TXP-S
CIP 0            REV 05   710-023792                     CIP-TXP-S
CIP 1            REV 05   710-023792                     CIP-TXP-S
PEM 0            Rev 04   740-027463   IPUPAFGKTA        PWR-TXP-7-60-DC
PEM 1            Rev 04   740-027463   IPUPAFGKTA        PWR-TXP-7-60-DC
Routing Engine 0 REV 06   740-026942                     RE-DUO-C2600-16G-S
Routing Engine 1 REV 06   740-026942                     RE-DUO-C2600-16G-S
CB 0             REV 05   710-022606                     CB-TXP-S
CB 1             REV 09   710-022606                     CB-TXP-S
SIB F13 0        REV 04   750-024564                     SIB-TXP-F13
SIB F13 3        REV 04   750-024564                     SIB-TXP-F13
SIB F13 8        REV 04   750-024564                     SIB-TXP-F13
SIB F13 11       REV 04   750-024564                     SIB-TXP-F13
SIB F13 12       REV 03   750-024564                     SIB-TXP-F13
SIB F2S 0/0      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 0/2      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 0/4      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 0/6      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/0      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/2      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/4      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/6      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/0      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/2      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/4      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/6      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/0      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/2      REV 03   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/4      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/6      REV 03   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/0      REV 03   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/2      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/4      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/6      REV 03   710-022603                     SIB-TXP-F2S-S
Fan Tray 0       REV 02   760-024497                     FANTRAY-TXP-H-S
Fan Tray 1       REV 02   760-024497                     FANTRAY-TXP-H-S
Fan Tray 2       REV 05   760-024502                     FANTRAY-TXP-V-S
Fan Tray 3
Fan Tray 4       REV 05   760-024502                     FANTRAY-TXP-V-S
Fan Tray 5       REV 02   760-024502                     FANTRAY-TXP-V-S
```



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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:
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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
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  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
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show chassis hardware detail (TX Matrix Plus Router)

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user@host> show chassis hardware detail
sfc0-re0:
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Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN111B023AHB      TXP
Midplane         REV 01   710-022574   TR7990            SFC Midplane
FPM Display      REV 03   710-024027   DW4699            TXP FPM Display
CIP 0            REV 01   710-023792   DR1437            TXP CIP
CIP 1            REV 02   710-023792   DS4564            TXP CIP
PEM 0            Rev 07   740-027463   UM26360           Power Entry Module
Routing Engine 0 REV 01   740-026942   737A-1024         SFC RE
  ad0    3887 MB  SMART CF             200811050193CEB1CEB1 Compact Flash
  ad1   30533 MB  SAMSUNG MCBQE32G8MPP-0V SY814A0762     Disk 1
Routing Engine 1 REV 01   740-026942   737A-1024         SFC RE
  ad0    3887 MB  SMART CF             20081105004C19A019A0 Compact Flash
  ad1   30533 MB  SAMSUNG MCBQE32G8MPP-0V SY814A0794     Disk 1
CB 0             REV 03   710-022606   DR7134            SFC Control Board
CB 1             REV 01   710-022606   DP8890            SFC Control Board
SPMB 0                    BUILTIN                        SFC Switch CPU
SPMB 1                    BUILTIN                        SFC Switch CPU
SIB F13 0        REV 03   750-024564   DT9478            F13 SIB
  B Board        REV 02   710-023431   DT6554            F13 SIB
SIB F13 1        REV 03   750-024564   DT9454            F13 SIB
  B Board        REV 02   710-023431   DT6551            F13 SIB
SIB F2S 0/0      REV 02   710-022603   DT2838            F2S SIB
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  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:
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Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN1101F27AHA     T1600
Midplane         REV 04   710-017247   RC5317           T Series Backplane
FPM GBUS         REV 10   710-002901   DS8197           T640 FPM Board
FPM Display      REV 01   710-021387   DS6433           T1600 FPM Display
CIP              REV 06   710-002895   DS1493           T Series CIP
PEM 0            Rev 08   740-017906   UD26601          Power Entry Module 3x80
SCG 0            REV 15   710-003423   DP5847           T640 Sonet Clock Gen.
SCG 1            REV 15   710-003423   DR0924           T640 Sonet Clock Gen.
Routing Engine 0 REV 01   740-026942   737F-1024        LCC RE
  ad0    3887 MB  SMART CF             2008110502B63E513E51 Compact Flash
  ad1   30533 MB  SAMSUNG MCBQE32G8MPP-0V SY814A1208     Disk 1
Routing Engine 1 REV 01   740-026942   737F-1024        LCC RE
  ad0    3887 MB  SMART CF             2008110500F9A8A8A8A8 Compact Flash
  ad1   30533 MB  SAMSUNG MCBQE32G8MPP-0V SY814A1076     Disk 1
CB 0             REV 05   710-022597   DV4264           LCC Control Board
CB 1             REV 03   710-022597   DP8558           LCC Control Board
FPC 0            REV 14   710-013037   DS9967           FPC Type 4-ES
  CPU            REV 08   710-016744   DS3989           ST-PMB2
  PIC 0          REV 12   750-013198   DL7506           1x Tunnel
  PIC 1          REV 12   750-013198   DL7505           1x Tunnel
  MMB 0          REV 01   710-025563   DS8524           ST-MMB2
  MMB 1          REV 01   710-025563   DS8373           ST-MMB2
FPC 1            REV 14   710-013037   DT0027           FPC Type 4-ES
  CPU            REV 09   710-016744   DS7684           ST-PMB2
  PIC 0          REV 12   750-013198   DL7512           1x Tunnel
  PIC 1          REV 12   750-013198   DL7498           1x Tunnel
  MMB 0          REV 01   710-025563   DS8494           ST-MMB2
  MMB 1          REV 01   710-025563   DS8436           ST-MMB2
SPMB 0           REV 04   710-023321   DV3867           LCC Switch CPU
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SPMB 1            REV 02    710-023321    DP0238             LCC Switch CPU
SIB 0             REV 06    710-022594    DT8268             LCC SIB
  B Board         REV 06    710-023185    DT5791             LCC SIB Mezz
SIB 1             REV 06    710-022594    DT8261             LCC SIB
  B Board         REV 06    710-023185    DT5769             LCC SIB Mezz
SIB 2             REV 04    710-022594    DS2315             LCC SIB
  B Board         REV 06    710-023185    DT5788             LCC SIB Mezz
SIB 3             REV 06    710-022594    DT8253             LCC SIB
  B Board         REV 06    710-023185    DT5811             LCC SIB Mezz
SIB 4             REV 06    710-022594    DT8248             LCC SIB
  B Board         REV 06    710-023185    DT5812             LCC SIB Mezz
Fan Tray 0                                                   Front Top Fan Tray
Fan Tray 1                                                   Front Bottom Fan Tray
Fan Tray 2                                                   Rear Fan Tray
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show chassis hardware models (TX Matrix Plus Router)

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user@host> show chassis hardware models
sfc0-re0:
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Hardware inventory:
Item              Version   Part number   Serial number      FRU model number
FPM Display       REV 03    710-024027    DX0282             CRAFT-TXP
CIP 0             REV 04    710-023792    DW4889             CIP-TXP
CIP 1             REV 04    710-023792    DW4887             CIP-TXP
PEM 0             Rev 07    740-027463    UM26368            ÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿ
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
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Fan Tray 3       REV 06   760-024502   DV9616            FANTRAY-TXP-R
Fan Tray 4       REV 06   760-024502   DV7807            FANTRAY-TXP-R
Fan Tray 5       REV 06   760-024502   DV7828            FANTRAY-TXP-R

lcc0-re0:
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Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 03   710-017247   RC3765            CHAS-BP-T1600-S
FPM Display      REV 01   710-021387   DN5441            CRAFT-T1600-S
CIP              REV 06   710-002895   DP6021            CIP-L-T640-S
PEM 0            Rev 07   740-017906   UA26384           PWR-T1600-3-80-DC-S
PEM 1            Rev 07   740-017906   UA26296           PWR-T1600-3-80-DC-S
SCG 0            REV 15   710-003423   DR0875            SCG-T-S
CB 0             REV 06   710-022597   DW8534            CB-LCC
CB 1             REV 06   710-022597   DW8527            CB-LCC
FPC 4            REV 12   710-013037   DJ8717            T1600-FPC4-ES
  PIC 0          REV 11   750-017405   DP8795            PD-4XGE-XFP
  PIC 1          REV 11   750-017405   DP8794            PD-4XGE-XFP
FPC 6            REV 14   710-013037   DS5335            T1600-FPC4-ES
  PIC 0          REV 13   750-017405   DS7634            PD-4XGE-XFP
  PIC 1          REV 13   750-017405   DS7637            PD-4XGE-XFP
FPC 7            REV 07   710-013035   DM0990            T1600-FPC3-ES
  PIC 0          REV 16   750-007141   JJ8067            PC-10GE-SFP
  PIC 1          REV 08   750-015749   WE9598            PC-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:
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Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 04   710-017247   RC5361            CHAS-BP-T1600-S
FPM Display      REV 01   710-021387   DS6430            CRAFT-T1600-S
CIP              REV 06   710-002895   DS4239            CIP-L-T640-S
PEM 0            Rev 08   740-017906   UD26649           PWR-T1600-3-80-DC-S
SCG 0            REV 15   710-003423   DP5820            SCG-T-S
CB 0             REV 06   710-022597   DW8523            CB-LCC
CB 1             REV 06   710-022597   DW8528            CB-LCC
FPC 4            REV 12   710-013037   DP8509            T1600-FPC4-ES
  PIC 0          REV 11   750-017405   DP8808            PD-4XGE-XFP
  PIC 1          REV 11   750-017405   DP7263            PD-4XGE-XFP
FPC 6            REV 14   710-013037   DS9961            T1600-FPC4-ES
  PIC 0          REV 13   750-017405   DS5532            PD-4XGE-XFP
  PIC 1          REV 13   750-017405   DS7639            PD-4XGE-XFP
FPC 7            REV 03   710-013035   DF5564            T1600-FPC3-ES
  PIC 0          REV 16   750-007141   JJ8063            PC-10GE-SFP
SIB 0            REV 08   710-022594   DW8035            SIB-TXP-T1600-S
SIB 1            REV 10   710-022594   DX7672            SIB-TXP-T1600-S
SIB 2            REV 08   710-022594   DW8060            SIB-TXP-T1600-S
SIB 3            REV 08   710-022594   DW8072            SIB-TXP-T1600-S
SIB 4            REV 08   710-022594   DW8043            SIB-TXP-T1600-S
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T-S
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Fan Tray 2                                              FANTRAY-TXP-R-S

lcc2-re0:
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Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 03   710-017247   RC3956            CHAS-BP-T1600-S
FPM Display      REV 01   710-021387   DN7030            CRAFT-T1600-S
CIP              REV 06   710-002895   DM3962            CIP-L-T640-S
PEM 0            Rev 08   740-017906   UD26519           PWR-T1600-3-80-DC-S
PEM 1            Rev 07   740-017906   UC26601           PWR-T1600-3-80-DC-S
SCG 0            REV 15   710-003423   DP0277            SCG-T-S
CB 0             REV 06   710-022597   DW8524            CB-LCC
CB 1             REV 06   710-022597   DW8536            CB-LCC
FPC 4            REV 12   710-013037   DR1194            T1600-FPC4-ES
  PIC 0          REV 11   750-017405   DP8811            PD-4XGE-XFP
  PIC 1          REV 11   750-017405   DP8823            PD-4XGE-XFP
FPC 5            REV 12   710-013037   DR1184            T1600-FPC4-ES
  PIC 1          REV 11   750-017405   DP4744            PD-4XGE-XFP
FPC 6            REV 12   710-013037   DN8622            T1600-FPC4-ES
  PIC 0          REV 14   750-012518   JY9924            PD-4OC192-SON-XFP
  PIC 1          REV 11   750-017405   DP8776            PD-4XGE-XFP
FPC 7            REV 04   710-013560   JR3968            T640-FPC3-E2
  PIC 0          REV 16   750-007141   NC9330            PC-10GE-SFP
SIB 0            REV 07   710-022594   DW4217            SIB-TXP-T1600-S
SIB 1            REV 07   710-022594   DW4213            SIB-TXP-T1600-S
SIB 2            REV 07   710-022594   DW4189            SIB-TXP-T1600-S
SIB 3            REV 07   710-022594   DW4173            SIB-TXP-T1600-S
SIB 4            REV 07   710-022594   DW4201            SIB-TXP-T1600-S
Fan Tray 0                                              FANTRAY-T-S
Fan Tray 1                                              FANTRAY-T-S
Fan Tray 2                                              FANTRAY-TXP-R-S

lcc3-re0:
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Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 04   710-017247   RC5319            CHAS-BP-T1600-S
FPM Display      REV 01   710-021387   DS6402            CRAFT-T1600-S
CIP              REV 06   710-002895   DR9973            CIP-L-T640-S
PEM 0            Rev 07   740-017906   UC26496           PWR-T1600-3-80-DC-S
PEM 1            Rev 07   740-017906   UC26599           PWR-T1600-3-80-DC-S
SCG 0            REV 15   710-003423   DP5831            SCG-T-S
CB 0             REV 06   710-022597   DW8533            CB-LCC
CB 1             REV 06   710-022597   DW8538            CB-LCC
FPC 0            REV 14   710-013037   DS5345            T1600-FPC4-ES
  PIC 0          REV 13   750-017405   DS7641            PD-4XGE-XFP
  PIC 1          REV 13   750-017405   DS5479            PD-4XGE-XFP
FPC 1            REV 14   710-013037   DS7338            T1600-FPC4-ES
  PIC 0          REV 13   750-017405   DS7631            PD-4XGE-XFP
  PIC 1          REV 13   750-017405   DS7632            PD-4XGE-XFP
FPC 2            REV 14   710-013037   DS9962            T1600-FPC4-ES
  PIC 0          REV 13   750-017405   DS7581            PD-4XGE-XFP
  PIC 1          REV 13   750-017405   DS7627            PD-4XGE-XFP
FPC 4            REV 10   710-010845   JZ6573            T640-FPC4-ES
  PIC 0          REV 14   750-012518   JT5124            PD-4OC192-SON-XFP
FPC 5            REV 14   710-013037   DT0016            T1600-FPC4-ES
  PIC 0          REV 14   750-012518   JY9918            PD-4OC192-SON-XFP
FPC 7            REV 07   710-013035   DM0967            T1600-FPC3-ES
  PIC 0          REV 16   750-007141   JJ8059            PC-10GE-SFP
  PIC 1          REV 13   750-004695   DM5712            PC-TUNNEL
```



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SIB 0           REV 07   710-022594   DW4174            SIB-TXP-T1600-S
SIB 1           REV 07   710-022594   DW4207            SIB-TXP-T1600-S
SIB 2           REV 06   710-022594   DT8231            SIB-TXP-T1600-S
SIB 3           REV 07   710-022594   DW4175            SIB-TXP-T1600-S
SIB 4           REV 07   710-022594   DW4209            SIB-TXP-T1600-S
Fan Tray 0                                              FANTRAY-T-S
Fan Tray 1                                              FANTRAY-T-S
Fan Tray 2                                              FANTRAY-TXP-R-S
```

show chassis hardware (TX Matrix Plus router with 3D SIBs)

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user@host> show chassis hardware
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11CAAA4AHB      TXP
Midplane         REV 05   710-022574   ABAC4696          SFC Midplane
FPM Display      REV 09   710-024027   EH3138            TXP FPM Display
CIP 0            REV 12   710-023792   EF6349            TXP CIP
CIP 1            REV 12   710-023792   EG5294            TXP CIP
PEM 0            Rev 06   740-027463   XH04595           Power Entry Module
PEM 1            Rev 06   740-027463   XH04592           Power Entry Module
Routing Engine 0 REV 07   740-026942   P737A-002541      RE-DUO-2600
Routing Engine 1 REV 07   740-026942   P737A-002602      RE-DUO-2600
CB 0             REV 15   710-022606   EH4376            SFC Control Board
CB 1             REV 15   710-022606   EH4379            SFC Control Board
SPMB 0                    BUILTIN                        SFC Switch CPU
SPMB 1                    BUILTIN                        SFC Switch CPU
SIB F13 0        REV 10   750-035002   EM9305            F13 SIB 3D
  B Board        REV 06   711-035082   EM9667            F13 SIB 3D Mezz
  P Board        REV 05   711-043544   EM9708            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB34FB00S         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB01H         CXP Module
  Xcvr 4         REV 01   740-047547   XB34FB02W         CXP Module
  Xcvr 6         REV 01   740-047547   XB34FB01T         CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB00W         CXP Module
  Xcvr 10        REV 01   740-047547   XB34FB01S         CXP Module
  Xcvr 12        REV 01   740-047547   XB34FB03H         CXP Module
  Xcvr 14        REV 01   740-047547   XB34FB023         CXP Module
SIB F13 3        REV 01   710-035001   EJ2612            F13 SIB 3D
  B Board        REV 01   711-035082   EJ3815            F13 SIB 3D Mezz
  P Board        REV 01   711-043544   EJ2678            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB48FB04C         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB00Z         CXP Module
  Xcvr 4         REV 01   740-047547   XB47FB036         CXP Module
  Xcvr 6         REV 01   740-047547   XB47FB029         CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB02N         CXP Module
  Xcvr 10        REV 01   740-047547   XB42FB0CS         CXP Module
  Xcvr 12        REV 01   740-047547   XB47FB01X         CXP Module
  Xcvr 14        REV 01   740-047547   XB48FB02F         CXP Module
SIB F13 6        REV 05   750-035002   EK2675            F13 SIB 3D
  B Board        REV 03   711-035082   EK2612            F13 SIB 3D Mezz
  P Board        REV 04   711-043544   EK1179            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB48FB01T         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB02M         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB031         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB04P         CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB02T         CXP Module
  Xcvr 10        REV 01   740-047547   XB34FB01V         CXP Module
  Xcvr 12        REV 01   740-047547   XB48FB02C         CXP Module
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  Xcvr 14                 NON-JNPR                         No Module
SIB F13 12       REV 01   710-035001   EJ2631              F13 SIB 3D
  B Board        REV 01   711-035082   EJ3808              F13 SIB 3D Mezz
  P Board        REV 01   711-043544   EJ2676              F13 SIB 3D Power
SIB F2S 0/0      REV 01   711-034977   EH9829              F2S SIB 3D
  B Board        REV 01   711-034979   EH9927              F2S SIB 3D Mezz
SIB F2S 0/2      REV 01   711-034977   EH9791              F2S SIB 3D
  B Board        REV 01   711-034979   EH9852              F2S SIB 3D Mezz
SIB F2S 0/4      REV 01   711-034977   EH9803              F2S SIB 3D
  B Board        REV 01   711-034979   EH9915              F2S SIB 3D Mezz
SIB F2S 0/6      REV 01   711-034977   EH9763              F2S SIB 3D
  B Board        REV 01   711-034979   EH9880              F2S SIB 3D Mezz
SIB F2S 1/0      REV 01   711-034977   EH9757              F2S SIB 3D
  B Board        REV 01   711-034979   EH9889              F2S SIB 3D Mezz
SIB F2S 1/2      REV 01   711-034977   EH9815              F2S SIB 3D
  B Board        REV 01   711-034979   EH9890              F2S SIB 3D Mezz
SIB F2S 1/4      REV 08   750-034978   EN1954              F2S SIB 3D
  B Board        REV 02   711-034979   EN1436              F2S SIB 3D Mezz
SIB F2S 1/6      REV 01   711-034977   EJ7054              F2S SIB 3D
  B Board        REV 01   711-034979   EJ8238              F2S SIB 3D Mezz
SIB F2S 2/0      REV 01   711-034977   EH9830              F2S SIB 3D
  B Board        REV 01   711-034979   EH9844              F2S SIB 3D Mezz
SIB F2S 2/2      REV 01   711-034977   EH9818              F2S SIB 3D
  B Board        REV 01   711-034979   EH9888              F2S SIB 3D Mezz
SIB F2S 2/4      REV 01   711-034977   EH9795              F2S SIB 3D
  B Board        REV 01   711-034979   EH9869              F2S SIB 3D Mezz
SIB F2S 2/6      REV 01   711-034977   EJ7026              F2S SIB 3D
  B Board        REV 01   711-034979   EJ8273              F2S SIB 3D Mezz
SIB F2S 3/0      REV 01   711-034977   EH9811              F2S SIB 3D
  B Board        REV 01   711-034979   EH9892              F2S SIB 3D Mezz
SIB F2S 3/2      REV 01   711-034977   EH9812              F2S SIB 3D
  B Board        REV 01   711-034979   EH9877              F2S SIB 3D Mezz
SIB F2S 3/4      REV 08   750-034978   EN1947              F2S SIB 3D
  B Board        REV 02   711-034979   EN1471              F2S SIB 3D Mezz
Fan Tray 0       REV 10   760-024497   EH3313              Front Fan Tray
Fan Tray 1       REV 10   760-024497   EH3290              Front Fan Tray
Fan Tray 2       REV 10   760-024502   EH3292              Rear Fan Tray
Fan Tray 3       REV 10   760-024502   EH3287              Rear Fan Tray
Fan Tray 4       REV 10   760-024502   EH3286              Rear Fan Tray
Fan Tray 5       REV 10   760-024502   EH3285              Rear Fan Tray

lcc0-re0:
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Hardware inventory:
Item             Version  Part number  Serial number       Description
Chassis                                JN11B23FEAHA        T1600
Midplane         REV 01   710-027486   RC9787              T-series Backplane
FPM GBUS         REV 13   710-002901   BBAG5132            T640 FPM Board
FPM Display      REV 04   710-021387   BBAL9612            T1600 FPM Display
CIP              REV 06   710-002895   BBAN0605            T-series CIP
PEM 0            REV 05   740-036442   1G022060143         Power Entry Module 6x60
PEM 1            REV 05   740-036442   1G022060011         Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAL7318            T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAL7255            T640 Sonet Clock Gen.
Routing Engine 0 REV 07   740-026941   P737F-002933        RE-DUO-1800
Routing Engine 1 REV 06   740-026941   P737F-002749        RE-DUO-1800
CB 0             REV 11   710-022597   EH3611              LCC Control Board
CB 1             REV 11   710-022597   EH4798              LCC Control Board
FPC 5            REV 17   710-013037   BBAC5333            FPC Type 4-ES
  CPU            REV 10   710-016744   BBAB7619            ST-PMB2
  PIC 0          REV 18   750-017405   BBAE3420            4x 10GE (LAN/WAN) XFP
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    Xcvr 0       REV 03   740-014289   T10C90659         XFP-10G-SR
  MMB 0          REV 05   710-025563   BBAB9538          ST-MMB2
  MMB 1          REV 05   710-025563   BBAB9502          ST-MMB2
FPC 7            REV 01   750-045173   BBAV0032          FPC Type 5-3D
  CPU
SPMB 0           REV 05   710-023321   EG9434            LCC Switch CPU
SPMB 1           REV 05   710-023321   EH3878            LCC Switch CPU
SIB 0            REV 01   750-041657   EH7997            LCC SIB 3D
  B Board        REV 01   711-042424   EH7674            LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB014         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB05A         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB052         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB01B         CXP Module
SIB 1            REV 01   750-041657   EH8023            LCC SIB 3D
  B Board        REV 01   711-042424   EH7659            LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB05J         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB01E         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB01J         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB02S         CXP Module
SIB 2            REV 03   750-041657   EJ6554            LCC SIB 3D
  B Board        REV 02   711-042424   EJ5756            LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB34FB01Z         CXP Module
  Xcvr 2         REV 01   740-047547   XB34FB013         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB04Z         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB05N         CXP Module
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
Fan Tray 2                                               Rear Fan Tray -- Rev 4

lcc2-re0:
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Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11B3975AHA      T1600
Midplane         REV 01   710-027486   RC9826            T-series Backplane
FPM GBUS         REV 13   710-002901   BBAG5124          T640 FPM Board
FPM Display      REV 03   710-021387   BBAJ1112          T1600 FPM Display
CIP              REV 06   710-002895   BBAL3744          T-series CIP
PEM 0            REV 05   740-036442   1G022060081       Power Entry Module 6x60
PEM 1            REV 05   740-036442   1G022060188       Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAH8775          T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAL7272          T640 Sonet Clock Gen.
Routing Engine 0 REV 07   740-026941   P737F-002992      RE-DUO-1800
Routing Engine 1 REV 07   740-026941   P737F-002938      RE-DUO-1800
CB 0             REV 11   710-022597   EH4805            LCC Control Board
CB 1             REV 11   710-022597   EH4786            LCC Control Board
FPC 1            REV 01   710-033873   BBAH0320          FPC Type 3-ES
  CPU            REV 11   710-016744   BBAF3281          ST-PMB2
  MMB 0          REV 06   710-025563   BBAF5061          ST-MMB2
FPC 5            REV 04   710-033871   BBAM5070          FPC Type 4-ES
  CPU            REV 11   710-016744   BBAM6653          ST-PMB2
  PIC 1          REV 20   750-017405   BBAM1296          4x 10GE (LAN/WAN) XFP
    Xcvr 0       REV 03   740-014289   T10B42981         XFP-10G-SR
  MMB 0          REV 07   710-025563   BBAN2631          ST-MMB2
  MMB 1          REV 07   710-025563   BBAN2538          ST-MMB2
SPMB 0           REV 05   710-023321   EH3903            LCC Switch CPU
SPMB 1           REV 05   710-023321   EH3902            LCC Switch CPU
SIB 0            REV 01   750-041657   EH8019            LCC SIB 3D
  B Board        REV 01   711-042424   EH7680            LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB04F         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB04S         CXP Module
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  Xcvr 4          REV 01   740-047547   XB48FB04B        CXP Module
  Xcvr 6          REV 01   740-047547   XB48FB043        CXP Module
SIB 1             REV 01   750-041657   EH8012           LCC SIB 3D
  B Board         REV 01   711-042424   EH7658           LCC SIB 3D Mezz
  Xcvr 0          REV 01   740-047547   XB48FB05E        CXP Module
  Xcvr 2          REV 01   740-047547   XB48FB01Z        CXP Module
  Xcvr 4          REV 01   740-047547   XB48FB018        CXP Module
  Xcvr 6          REV 01   740-047547   XB48FB054        CXP Module
SIB 2             REV 01   750-041657   EH7993           LCC SIB 3D
  B Board         REV 01   711-042424   EH7678           LCC SIB 3D Mezz
  Xcvr 0          REV 01   740-047547   XB48FB05C        CXP Module
  Xcvr 2          REV 01   740-047547   XB47FB00N        CXP Module
  Xcvr 4          REV 01   740-047547   XB48FB05U        CXP Module
  Xcvr 6          REV 01   740-047547   XB48FB05L        CXP Module
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
Fan Tray 2                                               Rear Fan Tray -- Rev 4
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show chassis hardware clei-models (TX Matrix Plus router with 3D SIBs)

```
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 09   710-024027                    CRAFT-TXP-S
CIP 0             REV 12   710-023792                    CIP-TXP-S
CIP 1             REV 12   710-023792                    CIP-TXP-S
PEM 0             Rev 06   740-027463   IPUPAFGKTA       PWR-TXP-7-60-DC-S
Routing Engine 0  REV 07   740-026942                    RE-DUO-C2600-16G-S
Routing Engine 1  REV 07   740-026942                    RE-DUO-C2600-16G-S
CB 0              REV 13   710-022606                    CB-TXP-S
CB 1              REV 14   710-022606                    CB-TXP-S
SIB F13 0         REV 10   750-035002   PROTOXCLEI       SIB-TXP-3D-F13-S
  Xcvr 0          REV 01   740-048813
  Xcvr 1          REV 01   740-048813
  Xcvr 2          REV 01   740-048813
  Xcvr 3          REV 01   740-048813
  Xcvr 4          REV 01   740-048813
  Xcvr 5          REV 01   740-048813
  Xcvr 6          REV 01   740-048813
  Xcvr 7          REV 01   740-048813
  Xcvr 8          REV 01   740-047547                    CXP-TXP-3D
  Xcvr 10         REV 01   740-047547                    CXP-TXP-3D
  Xcvr 12         REV 01   740-047547                    CXP-TXP-3D
  Xcvr 14         REV 01   740-047547                    CXP-TXP-3D
SIB F13 1         REV 10   750-035002   PROTOXCLEI       SIB-TXP-3D-F13-S
  Xcvr 0          REV 01   740-047547                    CXP-TXP-3D
  Xcvr 1          REV 01   740-047547                    CXP-TXP-3D
  Xcvr 2          REV 01   740-047547                    CXP-TXP-3D
  Xcvr 3          REV 01   740-047547                    CXP-TXP-3D
  Xcvr 4          REV 01   740-047547                    CXP-TXP-3D
  Xcvr 5          REV 01   740-047547                    CXP-TXP-3D
  Xcvr 6          REV 01   740-047547                    CXP-TXP-3D
  Xcvr 7          REV 01   740-047547                    CXP-TXP-3D
  Xcvr 8          REV 01   740-047547                    CXP-TXP-3D
  Xcvr 10         REV 01   740-047547                    CXP-TXP-3D
  Xcvr 12         REV 01   740-047547                    CXP-TXP-3D
  Xcvr 14         REV 01   740-047547                    CXP-TXP-3D
  Xcvr 0          REV 01   740-048813
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  Xcvr 1          REV 01   740-048813
  Xcvr 2          REV 01   740-048813
  Xcvr 3          REV 01   740-048813
  Xcvr 4          REV 01   740-048813
  Xcvr 5          REV 01   740-048813
  Xcvr 6          REV 01   740-048813
  Xcvr 7          REV 01   740-048813
  Xcvr 8          REV 01   740-048813
  Xcvr 10         REV 01   740-048813
  Xcvr 12         REV 01   740-048813
  Xcvr 14         REV 01   740-048813
  Xcvr 0          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 1          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 2          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 3          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 4          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 5          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 6          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 7          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 8          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 10         REV 01   740-047547                   CXP-TXP-3D
  Xcvr 12         REV 01   740-047547                   CXP-TXP-3D
  Xcvr 14         REV 01   740-047547                   CXP-TXP-3D
SIB F13 6         REV 16   750-035002   PROTOXCLEI      SIB-TXP-3D-F13
  Xcvr 0          REV 01   740-048813
  Xcvr 1          REV 01   740-048813
  Xcvr 2          REV 01   740-048813
  Xcvr 3          REV 01   740-048813
  Xcvr 4          REV 01   740-048813
  Xcvr 5          REV 01   740-048813
  Xcvr 6          REV 01   740-048813
  Xcvr 7          REV 01   740-048813
  Xcvr 8          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 10         REV 01   740-047547                   CXP-TXP-3D
  Xcvr 12         REV 01   740-047547                   CXP-TXP-3D
  Xcvr 14         REV 01   740-047547                   CXP-TXP-3D
SIB F13 7         REV 10   750-035002   PROTOXCLEI      SIB-TXP-3D-F13-S
  Xcvr 0          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 1          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 2          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 3          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 4          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 5          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 6          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 7          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 8          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 10         REV 01   740-047547                   CXP-TXP-3D
  Xcvr 12         REV 01   740-047547                   CXP-TXP-3D
  Xcvr 14         REV 01   740-047547                   CXP-TXP-3D
  Xcvr 0          REV 01   740-048813
  Xcvr 1          REV 01   740-048813
  Xcvr 2          REV 01   740-048813
  Xcvr 3          REV 01   740-048813
  Xcvr 4          REV 01   740-048813
  Xcvr 5          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 6          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 7          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 8          REV 01   740-047547                   CXP-TXP-3D
  Xcvr 10         REV 01   740-047547                   CXP-TXP-3D
  Xcvr 12         REV 01   740-047547                   CXP-TXP-3D
  Xcvr 14         REV 01   740-047547                   CXP-TXP-3D
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SIB F13 9         REV 16   750-035002   PROTOXCLEI        SIB-TXP-3D-F13
  Xcvr 0          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 1          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 2          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 3          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 4          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 5          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 6          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 7          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 8          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 10         REV 01   740-047547                     CXP-TXP-3D
  Xcvr 12         REV 01   740-047547                     CXP-TXP-3D
  Xcvr 14         REV 01   740-047547                     CXP-TXP-3D
SIB F13 11        REV 10   750-035002   PROTOXCLEI        750-035002
  Xcvr 0          REV 01   740-048813
  Xcvr 1          REV 01   740-048813
  Xcvr 2          REV 01   740-048813
  Xcvr 3          REV 01   740-048813
  Xcvr 4          REV 01   740-048813
  Xcvr 5          REV 01   740-048813
  Xcvr 6          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 7          REV 01   740-048813
  Xcvr 8          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 12         REV 01   740-047547                     CXP-TXP-3D
  Xcvr 14         REV 01   740-047547                     CXP-TXP-3D
SIB F13 12        REV 16   750-035002   PROTOXCLEI        SIB-TXP-3D-F13
  Xcvr 0          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 1          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 2          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 3          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 4          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 5          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 6          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 7          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 8          REV 01   740-047547                     CXP-TXP-3D
  Xcvr 10         REV 01   740-047547                     CXP-TXP-3D
  Xcvr 12         REV 01   740-047547                     CXP-TXP-3D
  Xcvr 14         REV 01   740-047547                     CXP-TXP-3D
SIB F2S 0/0       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 0/2       REV 07   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 0/4       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 0/6       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 1/0       REV 07   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 1/2       REV 07   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 1/4       REV 07   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 1/6       REV 08   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 2/0       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 2/2       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 2/4       REV 07   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 2/6       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 3/0       REV 07   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 3/2       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 3/4       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 3/6       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 4/0       REV 07   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 4/2       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 4/4       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
SIB F2S 4/6       REV 06   750-034978   PROTOXCLEI        SIB-TXP-3D-F2S
Fan Tray 0        REV 10   760-024497                     FANTRAY-TXP-H-S
Fan Tray 1        REV 10   760-024497                     FANTRAY-TXP-H-S
Fan Tray 2        REV 10   760-024502                     FANTRAY-TXP-V-S
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Fan Tray 3       REV 10   760-024502                        FANTRAY-TXP-V-S
Fan Tray 4       REV 10   760-024502                        FANTRAY-TXP-V-S
Fan Tray 5       REV 10   760-024502                        FANTRAY-TXP-V-S

lcc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 01   710-027486   IPMJ700DRD        CHAS-BP-T1600-S
FPM Display      REV 04   710-021387                     CRAFT-T1600-S
CIP              REV 06   710-002895                     CIP-L-T640-S
PEM 0            REV 05   740-036442   IPUPAG6KAA        PWR-T-6-60-DC-S
PEM 1            REV 05   740-036442   IPUPAG6KAA        PWR-T-6-60-DC-S
SCG 0            REV 18   710-003423                     SCG-T-S
SCG 1            REV 18   710-003423                     SCG-T-S
Routing Engine 0 REV 10   740-026941                     RE-DUO-C1800-8G-S
Routing Engine 1 REV 07   740-026941                     RE-DUO-C1800-8G-S
CB 0             REV 11   710-022597                     CB-LCC-S
CB 1             REV 11   710-022597                     CB-LCC-S
FPC 0            REV 01   750-045173   IP9IAL4DAB        T4000-FPC5-3D
  PIC 0          REV 17   750-034624   IP9IAL2DAA        PF-12XGE-SFPP
  PIC 1          REV 17   750-034624   IP9IAL2DAA        PF-12XGE-SFPP
FPC 3            REV 01   750-045173   IP9IAL4DAB        T4000-FPC5-3D
  PIC 0          REV 13   750-033423   XXXXXXXXDD        PF-12-24XGE-SFPP
FPC 4            REV 02   750-045173   IP9IAL4DAC        T4000-FPC5-3D
  PIC 0          REV 17   750-034624   IP9IAL2DAA        PF-12XGE-SFPP
  PIC 1          REV 17   750-034624   IP9IAL2DAA        PF-12XGE-SFPP
FPC 5            REV 01   750-045173   IP9IAL4DAB        T4000-FPC5-3D
  PIC 0          REV 17   750-034624   IP9IAL2DAA        PF-12XGE-SFPP
  PIC 1          REV 17   750-034624   IP9IAL2DAA        PF-12XGE-SFPP
FPC 6            REV 01   750-045173   IP9IAL4DAB        T4000-FPC5-3D
  PIC 0          REV 17   750-034624   IP9IAL2DAA        PF-12XGE-SFPP
  PIC 1          REV 10   750-035293   IP9IAL3DAA        PF-1CGE-CFP
SIB 0            REV 06   750-041657   PROTOXCLEI        SIB-TXP-3D-LCC
  Xcvr 0         REV 01   740-048813
  Xcvr 1         REV 01   740-048813
  Xcvr 2         REV 01   740-048813
  Xcvr 3         REV 01   740-048813
  Xcvr 4         REV 01   740-048813
  Xcvr 5         REV 01   740-048813
  Xcvr 6         REV 01   740-048813
  Xcvr 7         REV 01   740-048813
SIB 1            REV 06   750-041657   PROTOXCLEI        SIB-TXP-3D-LCC
  Xcvr 0         REV 01   740-048813
  Xcvr 1         REV 01   740-048813
  Xcvr 2         REV 01   740-048813
  Xcvr 3         REV 01   740-048813
  Xcvr 4         REV 01   740-048813
  Xcvr 5         REV 01   740-048813
  Xcvr 6         REV 01   740-048813
  Xcvr 7         REV 01   740-048813
SIB 2            REV 06   750-041657   PROTOXCLEI        SIB-TXP-3D-LCC
  Xcvr 0         REV 01   740-048813
  Xcvr 1         REV 01   740-048813
  Xcvr 2         REV 01   740-048813
  Xcvr 3         REV 01   740-048813
  Xcvr 4         REV 01   740-048813
  Xcvr 5         REV 01   740-048813
  Xcvr 6         REV 01   740-048813
  Xcvr 7         REV 01   740-048813
SIB 3            REV 07   750-041657   PROTOXCLEI        SIB-TXP-3D-LLC
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  Xcvr 0         REV 01   740-048813
  Xcvr 1         REV 01   740-048813
  Xcvr 2         REV 01   740-048813
  Xcvr 3         REV 01   740-048813
  Xcvr 4         REV 01   740-048813
  Xcvr 5         REV 01   740-048813
  Xcvr 6         REV 01   740-048813
  Xcvr 7         REV 01   740-048813
SIB 4            REV 06   750-041657   PROTOXCLEI        SIB-TXP-3D-LCC
  Xcvr 0         REV 01   740-048813
  Xcvr 1         REV 01   740-048813
  Xcvr 2         REV 01   740-048813
  Xcvr 3         REV 01   740-048813
  Xcvr 4         REV 01   740-048813
  Xcvr 5         REV 01   740-048813
  Xcvr 6         REV 01   740-048813
  Xcvr 7         REV 01   740-048813
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T-S
Fan Tray 2                                               FANTRAY-TXP3D-LCC-R-S
[Output Truncated]
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show chassis hardware detail (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis hardware detail
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11CAAA4AHB      TXP
Midplane         REV 05   710-022574   ABAC4696          SFC Midplane
FPM Display      REV 09   710-024027   EH3138            TXP FPM Display
CIP 0            REV 12   710-023792   EF6349            TXP CIP
CIP 1            REV 12   710-023792   EG5294            TXP CIP
PEM 0            Rev 06   740-027463   XH04595           Power Entry Module
PEM 1            Rev 06   740-027463   XH04592           Power Entry Module
Routing Engine 0 REV 07   740-026942   P737A-002541      RE-DUO-2600
  ad0    3823 MB  SMART CF             2011030400062C132C13 Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 201105100009A452A452 Disk 1
Routing Engine 1 REV 07   740-026942   P737A-002602      RE-DUO-2600
  ad0    3823 MB  SMART CF             20110508085EE471E471 Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 201110210089DF39DF39 Disk 1
CB 0             REV 15   710-022606   EH4376            SFC Control Board
CB 1             REV 15   710-022606   EH4379            SFC Control Board
SPMB 0                    BUILTIN                        SFC Switch CPU
SPMB 1                    BUILTIN                        SFC Switch CPU
SIB F13 0        REV 10   750-035002   EM9305            F13 SIB 3D
  B Board        REV 06   711-035082   EM9667            F13 SIB 3D Mezz
  P Board        REV 05   711-043544   EM9708            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB34FB00S         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB01H         CXP Module
  Xcvr 4         REV 01   740-047547   XB34FB02W         CXP Module
  Xcvr 6         REV 01   740-047547   XB34FB01T         CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB00W         CXP Module
  Xcvr 10        REV 01   740-047547   XB34FB01S         CXP Module
  Xcvr 12        REV 01   740-047547   XB34FB03H         CXP Module
  Xcvr 14        REV 01   740-047547   XB34FB023         CXP Module
SIB F13 3        REV 01   710-035001   EJ2612            F13 SIB 3D
  B Board        REV 01   711-035082   EJ3815            F13 SIB 3D Mezz
  P Board        REV 01   711-043544   EJ2678            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB48FB04C         CXP Module
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  Xcvr 2          REV 01   740-047547   XB48FB00Z          CXP Module
  Xcvr 4          REV 01   740-047547   XB47FB036          CXP Module
  Xcvr 6          REV 01   740-047547   XB47FB029          CXP Module
  Xcvr 8          REV 01   740-047547   XB48FB02N          CXP Module
  Xcvr 10         REV 01   740-047547   XB42FB0CS          CXP Module
  Xcvr 12         REV 01   740-047547   XB47FB01X          CXP Module
  Xcvr 14         REV 01   740-047547   XB48FB02F          CXP Module
SIB F13 6         REV 05   750-035002   EK2675             F13 SIB 3D
  B Board         REV 03   711-035082   EK2612             F13 SIB 3D Mezz
  P Board         REV 04   711-043544   EK1179             F13 SIB 3D Power
  Xcvr 0          REV 01   740-047547   XB48FB01T          CXP Module
  Xcvr 2          REV 01   740-047547   XB48FB02M          CXP Module
  Xcvr 4          REV 01   740-047547   XB48FB031          CXP Module
  Xcvr 6          REV 01   740-047547   XB48FB04P          CXP Module
  Xcvr 8          REV 01   740-047547   XB48FB02T          CXP Module
  Xcvr 10         REV 01   740-047547   XB34FB01V          CXP Module
  Xcvr 12         REV 01   740-047547   XB48FB02C          CXP Module
  Xcvr 14                  NON-JNPR                        No Module
SIB F13 12        REV 01   710-035001   EJ2631             F13 SIB 3D
  B Board         REV 01   711-035082   EJ3808             F13 SIB 3D Mezz
  P Board         REV 01   711-043544   EJ2676             F13 SIB 3D Power
SIB F2S 0/0       REV 01   711-034977   EH9829             F2S SIB 3D
  B Board         REV 01   711-034979   EH9927             F2S SIB 3D Mezz
SIB F2S 0/2       REV 01   711-034977   EH9791             F2S SIB 3D
  B Board         REV 01   711-034979   EH9852             F2S SIB 3D Mezz
SIB F2S 0/4       REV 01   711-034977   EH9803             F2S SIB 3D
  B Board         REV 01   711-034979   EH9915             F2S SIB 3D Mezz
SIB F2S 0/6       REV 01   711-034977   EH9763             F2S SIB 3D
  B Board         REV 01   711-034979   EH9880             F2S SIB 3D Mezz
SIB F2S 1/0       REV 01   711-034977   EH9757             F2S SIB 3D
  B Board         REV 01   711-034979   EH9889             F2S SIB 3D Mezz
SIB F2S 1/2       REV 01   711-034977   EH9815             F2S SIB 3D
  B Board         REV 01   711-034979   EH9890             F2S SIB 3D Mezz
SIB F2S 1/4       REV 08   750-034978   EN1954             F2S SIB 3D
  B Board         REV 02   711-034979   EN1436             F2S SIB 3D Mezz
SIB F2S 1/6       REV 01   711-034977   EJ7054             F2S SIB 3D
  B Board         REV 01   711-034979   EJ8238             F2S SIB 3D Mezz
SIB F2S 2/0       REV 01   711-034977   EH9830             F2S SIB 3D
  B Board         REV 01   711-034979   EH9844             F2S SIB 3D Mezz
SIB F2S 2/2       REV 01   711-034977   EH9818             F2S SIB 3D
  B Board         REV 01   711-034979   EH9888             F2S SIB 3D Mezz
SIB F2S 2/4       REV 01   711-034977   EH9795             F2S SIB 3D
  B Board         REV 01   711-034979   EH9869             F2S SIB 3D Mezz
SIB F2S 2/6       REV 01   711-034977   EJ7026             F2S SIB 3D
  B Board         REV 01   711-034979   EJ8273             F2S SIB 3D Mezz
SIB F2S 3/0       REV 01   711-034977   EH9811             F2S SIB 3D
  B Board         REV 01   711-034979   EH9892             F2S SIB 3D Mezz
SIB F2S 3/2       REV 01   711-034977   EH9812             F2S SIB 3D
  B Board         REV 01   711-034979   EH9877             F2S SIB 3D Mezz
SIB F2S 3/4       REV 08   750-034978   EN1947             F2S SIB 3D
  B Board         REV 02   711-034979   EN1471             F2S SIB 3D Mezz
Fan Tray 0        REV 10   760-024497   EH3313             Front Fan Tray
Fan Tray 1        REV 10   760-024497   EH3290             Front Fan Tray
Fan Tray 2        REV 10   760-024502   EH3292             Rear Fan Tray
Fan Tray 3        REV 10   760-024502   EH3287             Rear Fan Tray
Fan Tray 4        REV 10   760-024502   EH3286             Rear Fan Tray
Fan Tray 5        REV 10   760-024502   EH3285             Rear Fan Tray

lcc0-re0:
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Hardware inventory:
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Item             Version  Part number  Serial number     Description
Chassis                                JN11B23FEAHA      T1600
Midplane         REV 01   710-027486   RC9787            T-series Backplane
FPM GBUS         REV 13   710-002901   BBAG5132          T640 FPM Board
FPM Display      REV 04   710-021387   BBAL9612          T1600 FPM Display
CIP              REV 06   710-002895   BBAN0605          T-series CIP
PEM 0            REV 05   740-036442   1G022060143       Power Entry Module 6x60
PEM 1            REV 05   740-036442   1G022060011       Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAL7318          T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAL7255          T640 Sonet Clock Gen.
Routing Engine 0 REV 07   740-026941   P737F-002933      RE-DUO-1800
  ad0    3823 MB  SMART CF             201103030490604E604E Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 20110729028B11D411D4 Disk 1
Routing Engine 1 REV 06   740-026941   P737F-002749      RE-DUO-1800
  ad0    3823 MB  SMART CF             2011010504EB99649964 Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 201102140058934A934A Disk 1
CB 0             REV 11   710-022597   EH3611            LCC Control Board
CB 1             REV 11   710-022597   EH4798            LCC Control Board
FPC 5            REV 17   710-013037   BBAC5333          FPC Type 4-ES
  CPU            REV 10   710-016744   BBAB7619          ST-PMB2
  PIC 0          REV 18   750-017405   BBAE3420          4x 10GE (LAN/WAN) XFP
    Xcvr 0       REV 03   740-014289   T10C90659         XFP-10G-SR
  MMB 0          REV 05   710-025563   BBAB9538          ST-MMB2
  MMB 1          REV 05   710-025563   BBAB9502          ST-MMB2
FPC 7            REV 01   750-045173   BBAV0032          FPC Type 5-3D
  CPU
SPMB 0           REV 05   710-023321   EG9434            LCC Switch CPU
SPMB 1           REV 05   710-023321   EH3878            LCC Switch CPU
SIB 0            REV 01   750-041657   EH7997            LCC SIB 3D
  B Board        REV 01   711-042424   EH7674            LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB014         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB05A         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB052         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB01B         CXP Module
SIB 1            REV 01   750-041657   EH8023            LCC SIB 3D
  B Board        REV 01   711-042424   EH7659            LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB05J         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB01E         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB01J         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB02S         CXP Module
SIB 2            REV 03   750-041657   EJ6554            LCC SIB 3D
  B Board        REV 02   711-042424   EJ5756            LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB34FB01Z         CXP Module
  Xcvr 2         REV 01   740-047547   XB34FB013         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB04Z         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB05N         CXP Module
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
Fan Tray 2                                               Rear Fan Tray -- Rev 4

lcc2-re0:
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Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11B3975AHA      T1600
Midplane         REV 01   710-027486   RC9826            T-series Backplane
FPM GBUS         REV 13   710-002901   BBAG5124          T640 FPM Board
FPM Display      REV 03   710-021387   BBAJ1112          T1600 FPM Display
CIP              REV 06   710-002895   BBAL3744          T-series CIP
PEM 0            REV 05   740-036442   1G022060081       Power Entry Module 6x60
PEM 1            REV 05   740-036442   1G022060188       Power Entry Module 6x60
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SCG 0            REV 18   710-003423   BBAH8775         T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAL7272         T640 Sonet Clock Gen.
Routing Engine 0 REV 07   740-026941   P737F-002992     RE-DUO-1800
  ad0    3823 MB  SMART CF             201103030356329E329E Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 201105100048 8D8B8D8B Disk 1
Routing Engine 1 REV 07   740-026941   P737F-002938     RE-DUO-1800
  ad0    3823 MB  SMART CF             20110304000F02680268 Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 201105300A70F325F325 Disk 1
CB 0             REV 11   710-022597   EH4805           LCC Control Board
CB 1             REV 11   710-022597   EH4786           LCC Control Board
FPC 1            REV 01   710-033873   BBAH0320         FPC Type 3-ES
  CPU            REV 11   710-016744   BBAF3281         ST-PMB2
  MMB 0          REV 06   710-025563   BBAF5061         ST-MMB2
FPC 5            REV 04   710-033871   BBAM5070         FPC Type 4-ES
  CPU            REV 11   710-016744   BBAM6653         ST-PMB2
  PIC 1          REV 20   750-017405   BBAM1296         4x 10GE (LAN/WAN) XFP
    Xcvr 0       REV 03   740-014289   T10B42981        XFP-10G-SR
  MMB 0          REV 07   710-025563   BBAN2631         ST-MMB2
  MMB 1          REV 07   710-025563   BBAN2538         ST-MMB2
SPMB 0           REV 05   710-023321   EH3903           LCC Switch CPU
SPMB 1           REV 05   710-023321   EH3902           LCC Switch CPU
SIB 0            REV 01   750-041657   EH8019           LCC SIB 3D
  B Board        REV 01   711-042424   EH7680           LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB04F        CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB04S        CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB04B        CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB043        CXP Module
SIB 1            REV 01   750-041657   EH8012           LCC SIB 3D
  B Board        REV 01   711-042424   EH7658           LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB05E        CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB01Z        CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB018        CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB054        CXP Module
SIB 2            REV 01   750-041657   EH7993           LCC SIB 3D
  B Board        REV 01   711-042424   EH7678           LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB05C        CXP Module
  Xcvr 2         REV 01   740-047547   XB47FB00N        CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB05U        CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB05L        CXP Module
Fan Tray 0                                              Front Top Fan Tray
Fan Tray 1                                              Front Bottom Fan Tray
Fan Tray 2                                              Rear Fan Tray -- Rev 4
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show chassis hardware lcc (TX Matrix Plus router with 3D SIBs)

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user@host> show chassis hardware lcc 0
lcc0-re0:
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Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN11B23FEAHA     T1600
Midplane         REV 01   710-027486   RC9787           T-series Backplane
FPM GBUS         REV 13   710-002901   BBAG5132         T640 FPM Board
FPM Display      REV 04   710-021387   BBAL9612         T1600 FPM Display
CIP              REV 06   710-002895   BBAN0605         T-series CIP
PEM 0            REV 05   740-036442   1G022060143      Power Entry Module 6x60
PEM 1            REV 05   740-036442   1G022060011      Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAL7318         T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAL7255         T640 Sonet Clock Gen.
Routing Engine 0 REV 07   740-026941   P737F-002933     RE-DUO-1800
Routing Engine 1 REV 06   740-026941   P737F-002749     RE-DUO-1800
```

```
CB 0              REV 11   710-022597   EH3611            LCC Control Board
CB 1              REV 11   710-022597   EH4798            LCC Control Board
FPC 5             REV 17   710-013037   BBAC5333          FPC Type 4-ES
  CPU             REV 10   710-016744   BBAB7619          ST-PMB2
  PIC 0           REV 18   750-017405   BBAE3420          4x 10GE (LAN/WAN) XFP
    Xcvr 0        REV 03   740-014289   T10C90659         XFP-10G-SR
  MMB 0           REV 05   710-025563   BBAB9538          ST-MMB2
  MMB 1           REV 05   710-025563   BBAB9502          ST-MMB2
FPC 7             REV 01   750-045173   BBAV0032          FPC Type 5-3D
  CPU
SPMB 0            REV 05   710-023321   EG9434            LCC Switch CPU
SPMB 1            REV 05   710-023321   EH3878            LCC Switch CPU
SIB 0             REV 01   750-041657   EH7997            LCC SIB 3D
  B Board         REV 01   711-042424   EH7674            LCC SIB 3D Mezz
  Xcvr 0          REV 01   740-047547   XB48FB014         CXP Module
  Xcvr 2          REV 01   740-047547   XB48FB05A         CXP Module
  Xcvr 4          REV 01   740-047547   XB48FB052         CXP Module
  Xcvr 6          REV 01   740-047547   XB48FB01B         CXP Module
SIB 1             REV 01   750-041657   EH8023            LCC SIB 3D
  B Board         REV 01   711-042424   EH7659            LCC SIB 3D Mezz
  Xcvr 0          REV 01   740-047547   XB48FB05J         CXP Module
  Xcvr 2          REV 01   740-047547   XB48FB01E         CXP Module
  Xcvr 4          REV 01   740-047547   XB48FB01J         CXP Module
  Xcvr 6          REV 01   740-047547   XB48FB02S         CXP Module
SIB 2             REV 03   750-041657   EJ6554            LCC SIB 3D
  B Board         REV 02   711-042424   EJ5756            LCC SIB 3D Mezz
  Xcvr 0          REV 01   740-047547   XB34FB01Z         CXP Module
  Xcvr 2          REV 01   740-047547   XB34FB013         CXP Module
  Xcvr 4          REV 01   740-047547   XB48FB04Z         CXP Module
  Xcvr 6          REV 01   740-047547   XB48FB05N         CXP Module
Fan Tray 0                                                Front Top Fan Tray
Fan Tray 1                                                Front Bottom Fan Tray
Fan Tray 2                                                Rear Fan Tray -- Rev 4
```

show chassis hardware sfc (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis hardware sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN11CAAA4AHB      TXP
Midplane          REV 05   710-022574   ABAC4696          SFC Midplane
FPM Display       REV 09   710-024027   EH3138            TXP FPM Display
CIP 0             REV 12   710-023792   EF6349            TXP CIP
CIP 1             REV 12   710-023792   EG5294            TXP CIP
PEM 0             Rev 06   740-027463   XH04595           Power Entry Module
PEM 1             Rev 06   740-027463   XH04592           Power Entry Module
Routing Engine 0 REV 07    740-026942   P737A-002541      RE-DUO-2600
Routing Engine 1 REV 07    740-026942   P737A-002602      RE-DUO-2600
CB 0              REV 15   710-022606   EH4376            SFC Control Board
CB 1              REV 15   710-022606   EH4379            SFC Control Board
SPMB 0                     BUILTIN                        SFC Switch CPU
SPMB 1                     BUILTIN                        SFC Switch CPU
SIB F13 0         REV 10   750-035002   EM9305            F13 SIB 3D
  B Board         REV 06   711-035082   EM9667            F13 SIB 3D Mezz
  P Board         REV 05   711-043544   EM9708            F13 SIB 3D Power
  Xcvr 0          REV 01   740-047547   XB34FB00S         CXP Module
  Xcvr 2          REV 01   740-047547   XB48FB01H         CXP Module
  Xcvr 4          REV 01   740-047547   XB34FB02W         CXP Module
  Xcvr 6          REV 01   740-047547   XB34FB01T         CXP Module
```



```
  Xcvr 8         REV 01   740-047547   XB48FB00W         CXP Module
  Xcvr 10        REV 01   740-047547   XB34FB01S         CXP Module
  Xcvr 12        REV 01   740-047547   XB34FB03H         CXP Module
  Xcvr 14        REV 01   740-047547   XB34FB023         CXP Module
SIB F13 3        REV 01   710-035001   EJ2612            F13 SIB 3D
  B Board        REV 01   711-035082   EJ3815            F13 SIB 3D Mezz
  P Board        REV 01   711-043544   EJ2678            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB48FB04C         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB00Z         CXP Module
  Xcvr 4         REV 01   740-047547   XB47FB036         CXP Module
  Xcvr 6         REV 01   740-047547   XB47FB029         CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB02N         CXP Module
  Xcvr 10        REV 01   740-047547   XB42FB0CS         CXP Module
  Xcvr 12        REV 01   740-047547   XB47FB01X         CXP Module
  Xcvr 14        REV 01   740-047547   XB48FB02F         CXP Module
SIB F13 6        REV 05   750-035002   EK2675            F13 SIB 3D
  B Board        REV 03   711-035082   EK2612            F13 SIB 3D Mezz
  P Board        REV 04   711-043544   EK1179            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB48FB01T         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB02M         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB031         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB04P         CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB02T         CXP Module
  Xcvr 10        REV 01   740-047547   XB34FB01V         CXP Module
  Xcvr 12        REV 01   740-047547   XB48FB02C         CXP Module
  Xcvr 14                 NON-JNPR                       No Module
SIB F13 12       REV 01   710-035001   EJ2631            F13 SIB 3D
  B Board        REV 01   711-035082   EJ3808            F13 SIB 3D Mezz
  P Board        REV 01   711-043544   EJ2676            F13 SIB 3D Power
SIB F2S 0/0      REV 01   711-034977   EH9829            F2S SIB 3D
  B Board        REV 01   711-034979   EH9927            F2S SIB 3D Mezz
SIB F2S 0/2      REV 01   711-034977   EH9791            F2S SIB 3D
  B Board        REV 01   711-034979   EH9852            F2S SIB 3D Mezz
SIB F2S 0/4      REV 01   711-034977   EH9803            F2S SIB 3D
  B Board        REV 01   711-034979   EH9915            F2S SIB 3D Mezz
SIB F2S 0/6      REV 01   711-034977   EH9763            F2S SIB 3D
  B Board        REV 01   711-034979   EH9880            F2S SIB 3D Mezz
SIB F2S 1/0      REV 01   711-034977   EH9757            F2S SIB 3D
  B Board        REV 01   711-034979   EH9889            F2S SIB 3D Mezz
SIB F2S 1/2      REV 01   711-034977   EH9815            F2S SIB 3D
  B Board        REV 01   711-034979   EH9890            F2S SIB 3D Mezz
SIB F2S 1/4      REV 08   750-034978   EN1954            F2S SIB 3D
  B Board        REV 02   711-034979   EN1436            F2S SIB 3D Mezz
SIB F2S 1/6      REV 01   711-034977   EJ7054            F2S SIB 3D
  B Board        REV 01   711-034979   EJ8238            F2S SIB 3D Mezz
SIB F2S 2/0      REV 01   711-034977   EH9830            F2S SIB 3D
  B Board        REV 01   711-034979   EH9844            F2S SIB 3D Mezz
SIB F2S 2/2      REV 01   711-034977   EH9818            F2S SIB 3D
  B Board        REV 01   711-034979   EH9888            F2S SIB 3D Mezz
SIB F2S 2/4      REV 01   711-034977   EH9795            F2S SIB 3D
  B Board        REV 01   711-034979   EH9869            F2S SIB 3D Mezz
SIB F2S 2/6      REV 01   711-034977   EJ7026            F2S SIB 3D
  B Board        REV 01   711-034979   EJ8273            F2S SIB 3D Mezz
SIB F2S 3/0      REV 01   711-034977   EH9811            F2S SIB 3D
  B Board        REV 01   711-034979   EH9892            F2S SIB 3D Mezz
SIB F2S 3/2      REV 01   711-034977   EH9812            F2S SIB 3D
  B Board        REV 01   711-034979   EH9877            F2S SIB 3D Mezz
SIB F2S 3/4      REV 08   750-034978   EN1947            F2S SIB 3D
  B Board        REV 02   711-034979   EN1471            F2S SIB 3D Mezz
Fan Tray 0       REV 10   760-024497   EH3313            Front Fan Tray
Fan Tray 1       REV 10   760-024497   EH3290            Front Fan Tray
```



```
Fan Tray 2        REV 10    760-024502   EH3292            Rear Fan Tray
Fan Tray 3        REV 10    760-024502   EH3287            Rear Fan Tray
Fan Tray 4        REV 10    760-024502   EH3286            Rear Fan Tray
Fan Tray 5        REV 10    760-024502   EH3285            Rear Fan Tray
```

show chassis hardware (16-Port 10-Gigabit Ethernet MPC with SFP+ Optics [MX Series Routers])

```
user@host> show chassis hardware
Hardware inventory:
    Item             Version  Part number  Serial number     Description
    Chassis                                JN112D865AFA      MX960
    Midplane         REV 03   710-013698   TS3339            MX960 Backplane
    FPM Board        REV 03   710-014974   WW6267            Front Panel Display

    PDM              Rev 03   740-013110   QCS12485026       Power Distribution
Module
    PEM 0            Rev 04   740-013682   QCS12434086       PS 1.7kW; 200-240VAC
 in
    PEM 1            Rev 04   740-013682   QCS1243408Z       PS 1.7kW; 200-240VAC
 in
    PEM 2            Rev 04   740-013682   QCS1243407X       PS 1.7kW; 200-240VAC
 in
    Routing Engine 0 REV 07   740-015113   9009009677        RE-S-1300
    Routing Engine 1 REV 07   740-015113   9009011510        RE-S-1300
    CB 0             REV 03   710-021523   XF0394            MX SCB
    CB 1             REV 03   710-021523   XF0550            MX SCB
    CB 2             REV 03   710-021523   XD7455            MX SCB
    FPC 4            REV 02   750-028467   JR6127            MPC M 16x 10GE
      CPU            REV 02   711-029089   JX0129            AS PMB
      PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Fan Tray 0       REV 05   740-014971   TP9990            Fan Tray
    Fan Tray 1       REV 05   740-014971   VS1709            Fan Tray
```

show chassis hardware (MPC3E [MX Series Routers])

```
user@host> show chassis hardware
Hardware inventory:
   Item             Version  Part number   Serial number     Description
   Chassis                                 JN1101AFEAFB      MX480
   Midplane         REV 05   710-017414    TR4444            MX480 Midplane
   FPM Board        REV 02   710-017254    KG6056            Front Panel Display

   PEM 0           Rev 03   740-017330    QCS082090FC      PS 1.2-1.7kW; 100-240V

   PEM 1           Rev 03   740-017330    QCS082090FD      PS 1.2-1.7kW; 100-240V

   Routing Engine 0 REV 07   740-013063    9009004124        RE-S-2000
   Routing Engine 1 REV 07   740-013063    9009005569        RE-S-2000
   CB 0             REV 07   710-021523    XZ3587            MX SCB
   CB 1             REV 03   710-021523    KH8306            MX SCB
   FPC 1            REV 04.1.07 750-033205 P1240             MPC Type 3
    CPU             REV 01   711-035209    YL0504            HMPC PMB 2G
    MIC 1           REV 10   750-033199    YX4495            1X100GE CFP
     PIC 2                   BUILTIN       BUILTIN           1X100GE CFP
      Xcvr 0        REV 01   740-032210    C22CQNE           CFP-100G-LR4
   FPC 2            REV 26   750-016670    KH0045            DPCE 40x 1GE R EQ
    CPU             REV 07   710-013713    KF5448            DPC PMB
    PIC 0                    BUILTIN       BUILTIN           10x 1GE(LAN) EQ
```

```
      Xcvr 0          REV 01    740-011613    PF21JHU           SFP-SX
     PIC 1                      BUILTIN       BUILTIN           10x 1GE(LAN) EQ
      Xcvr 9          REV 01    740-011613    AM0813S8ZL6       SFP-SX
     PIC 2                      BUILTIN       BUILTIN           10x 1GE(LAN) EQ
      Xcvr 0          REV 02    740-011613    PGL2KYF           SFP-SX
      Xcvr 2          REV 01    740-011613    AM0806S8N4P       SFP-SX
     PIC 3                      BUILTIN       BUILTIN           10x 1GE(LAN) EQ
      Xcvr 5          REV 01    740-011613    AM0815S967N       SFP-SX
      Xcvr 7          REV 01    740-011613    AM0806S8N1X       SFP-SX
      Xcvr 8          REV 01    740-011613    AM0815S967J       SFP-SX
      Xcvr 9          REV 01    740-011613    AM0815S967M       SFP-SX
    FPC 3             REV 12.2.09 750-033205  YR9443            MPC Type 3
     CPU              REV 03    711-035209    YL6931            HMPC PMB 2G
     MIC 0            REV 05    750-033199    YR3269            1X100GE CFP
      PIC 0                     BUILTIN       BUILTIN           1X100GE CFP
       Xcvr 0         REV 01    740-032210    ULHOKG3           CFP-100G-LR4
     MIC 1            REV 02    750-033199    YG3245            1X100GE CFP
      PIC 2                     BUILTIN       BUILTIN           1X100GE CFP
       Xcvr 0         REV 01    740-032210    ULHOKGF           CFP-100G-LR4
   FPC 4              REV 12.3.09 750-033205  YR9437            MPC Type 3
    CPU               REV 03    711-035209    YT5857            HMPC PMB 2G
    MIC 0             REV 05    750-033199    YR3295            1X100GE CFP
     PIC 0                      BUILTIN       BUILTIN           1X100GE CFP
      Xcvr 0                    NON-JNPR      X12000187         CFP-100G-SR10
    MIC 1             REV 10    750-033199    YX4518            1X100GE CFP
     PIC 2                      BUILTIN       BUILTIN           1X100GE CFP
      Xcvr 0         REV 01     740-035329    X12J00008         CFP-100G-SR10
   FPC 5             REV 06     750-024884    JW9769            MPC Type 2 3D EQ
   CPU               REV 02     711-028401    JR6158            MPC PMB 2G Proto
   MIC 0             REV 05     750-028387    JR6197            3D 4x 10GE  XFP
    PIC 0                       BUILTIN       BUILTIN           2x 10GE  XFP
     Xcvr 0          REV 01     740-014289    T07M71112         XFP-10G-SR
     Xcvr 1          REV 02     740-014289    T08L85610         XFP-10G-SR
     PIC 1                      BUILTIN       BUILTIN           2x 10GE  XFP
   MIC 1             REV 22     750-028392    YM0053           3D 20x 1GE(LAN) SFP

    PIC 2                       BUILTIN       BUILTIN           10x 1GE(LAN) SFP
     Xcvr 0          REV 01     740-011613    AM0703S005B       SFP-SX
     Xcvr 1          REV 01     740-011613    E07L01352         SFP-SX
    PIC 3                       BUILTIN       BUILTIN           10x 1GE(LAN) SFP
     Xcvr 5          REV 01     740-013111    6500217           SFP-T
     Xcvr 9          REV 02     740-013111    8499527           SFP-T
   Fan Tray                                                     Left Fan Tray
```

The PIC number for MIC 1 always starts from 2 (even if the first MIC is a 1X100GE CFP or a legacy MIC).

show chassis hardware (QFX3500 Switches)

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                  QFX3500
Routing Engine 0          BUILTIN      BUILTIN           QFX Routing Engine
FPC 0            REV 04   750-044071   BBAR3902          QFX3500-48S4Q-AFI
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           48x 10G-SFP+
  PIC 1                   BUILTIN      BUILTIN           15x 10G-SFP+
  MGMT BRD       REV 02   750-044063   BBAR0398          QFX3500-MGMT-SFP-AFO
    Xcvr 0       REV 01   740-011614   AC0946S0BD1       SFP-LX10
    Xcvr 1       REV 02   740-013111   A281922           SFP-T
```

```
Power Supply 0    Rev 04    740-032091    UI00677         JPSU-650W-AC-AFI
Power Supply 1    REV 00    740-041741    VJ00162         JPSU-650W-AC-AFO
Fan Tray 0                                                QFX Fan Tray, Back to
Front Airlfow
Fan Tray 1                                                QFX Fan Tray, Back to
Front Airlfow
Fan Tray 2                                                QFX Fan Tray, Back to
Front Airlfow
```

show chassis hardware detail (QFX3500 Switches)

```
user@switch> show chassis hardware detail
Hardware inventory:
Item              Version   Part number   Serial number   Description
Chassis                                   JN000TEST5      QFX3500
Routing Engine 0            BUILTIN       BUILTIN         QFX Routing Engine
FPC 0             REV 05    750-036931    EE0823          QFX3500-48S4Q-AFI


  CPU                       BUILTIN       BUILTIN         FPC CPU
  PIC 0                     BUILTIN       BUILTIN         48x 10G-SFP+
    Xcvr 0        REV 01    740-030589    S99E270079      SFP+-10G-LPBK
    Xcvr 1        REV 01    740-030589    S9AK450099      SFP+-10G-LPBK
    Xcvr 2        REV 01    740-030589    S99E270078      SFP+-10G-LPBK
    Xcvr 3        REV 01    740-030589    S9AK450098      SFP+-10G-LPBK
    Xcvr 4        REV 01    740-030589    S99E270075      SFP+-10G-LPBK
    Xcvr 5        REV 01    740-030589    S9AK450093      SFP+-10G-LPBK
    Xcvr 6        REV 01    740-030589    S9AK450097      SFP+-10G-LPBK
    Xcvr 7        REV 01    740-030589    S9AK450095      SFP+-10G-LPBK
    Xcvr 8        REV 01    740-030589    S99E270072      SFP+-10G-LPBK
    Xcvr 9        REV 01    740-030589    S99E270073      SFP+-10G-LPBK
    Xcvr 10       REV 01    740-030589    S99E270080      SFP+-10G-LPBK
    Xcvr 11       REV 01    740-030589    S9AK450169      SFP+-10G-LPBK
    Xcvr 12       REV 01    740-030589    S99E270076      SFP+-10G-LPBK
    Xcvr 13       REV 01    740-030589    S9AK450167      SFP+-10G-LPBK
    Xcvr 14       REV 01    740-030589    S9AK450170      SFP+-10G-LPBK
    Xcvr 15       REV 01    740-030589    S9AK450166      SFP+-10G-LPBK
    Xcvr 16       REV 01    740-030589    S9AK450092      SFP+-10G-LPBK
    Xcvr 17       REV 01    740-030589    S9AK450163      SFP+-10G-LPBK
    Xcvr 18       REV 01    740-030589    S9AK450094      SFP+-10G-LPBK
    Xcvr 19       REV 01    740-030589    S9AK450100      SFP+-10G-LPBK
    Xcvr 20       REV 01    740-030589    S9AK450168      SFP+-10G-LPBK
    Xcvr 21       REV 01    740-030589    S9AK450165      SFP+-10G-LPBK
    Xcvr 22       REV 01    740-030589    S9AK450073      SFP+-10G-LPBK
    Xcvr 23       REV 01    740-030589    S9AK450164      SFP+-10G-LPBK
    Xcvr 24       REV 01    740-030589    S9AK450074      SFP+-10G-LPBK
    Xcvr 25       REV 01    740-030589    SA62270195      SFP+-10G-LPBK
    Xcvr 26       REV 01    740-030589    S9AK450078      SFP+-10G-LPBK
    Xcvr 27       REV 01    740-030589    S9AK450024      SFP+-10G-LPBK
    Xcvr 28       REV 01    740-030589    S9AK450027      SFP+-10G-LPBK
    Xcvr 29       REV 01    740-030589    S9AK450080      SFP+-10G-LPBK
    Xcvr 30       REV 01    740-030589    S9AK450030      SFP+-10G-LPBK
    Xcvr 31       REV 01    740-030589    S9AK450025      SFP+-10G-LPBK
    Xcvr 32       REV 01    740-030589    S9AK450023      SFP+-10G-LPBK
    Xcvr 33       REV 01    740-030589    S9AK450075      SFP+-10G-LPBK
    Xcvr 34       REV 01    740-030589    S9AK450161      SFP+-10G-LPBK
    Xcvr 35       REV 01    740-030589    S9AK450071      SFP+-10G-LPBK
    Xcvr 36       REV 01    740-030589    S9AK450072      SFP+-10G-LPBK
    Xcvr 37       REV 01    740-030589    S9AK450022      SFP+-10G-LPBK
    Xcvr 38       REV 01    740-030589    S9AK450021      SFP+-10G-LPBK
    Xcvr 39       REV 01    740-030589    S9AK450175      SFP+-10G-LPBK
```

```
    Xcvr 40       REV 01    740-030589    S9AK450162        SFP+-10G-LPBK
    Xcvr 41       REV 01    740-030589    S99E270074        SFP+-10G-LPBK
    Xcvr 42       REV 01    740-030589    S9AK450174        SFP+-10G-LPBK
    Xcvr 43       REV 01    740-030589    S9AK450077        SFP+-10G-LPBK
    Xcvr 44       REV 01    740-030589    S9AK450076        SFP+-10G-LPBK
    Xcvr 45       REV 01    740-030589    S9AK450026        SFP+-10G-LPBK
    Xcvr 46       REV 01    740-030589    S9AK450079        SFP+-10G-LPBK
    Xcvr 47       REV 01    740-030589    S9AK450029        SFP+-10G-LPBK
  PIC 1                     BUILTIN       BUILTIN           15x 10G-SFP+
    Xcvr 1        REV 01    740-032986    QA170087          QSFP+-40G-SR4
    Xcvr 4        REV 01    740-032986    QA360442          QSFP+-40G-SR4
    Xcvr 8        REV 01    740-032986    QA170091          QSFP+-40G-SR4
    Xcvr 12       REV 01    740-032986    QA170042          QSFP+-40G-SR4
MGMT BRD        REV 08    750-036946    EE0731            QFX3500-MB
Power Supply 0    Rev 04    740-032091    UI00690           QFX PS 650W AC
Power Supply 1    Rev 04    740-032091    UI00679           QFX PS 650W AC
Fan Tray 0                                                  QFX Fan Tray
Fan Tray 1                                                  QFX Fan Tray
```

show chassis hardware models (QFX3500 Switches)

```
user@switch> show chassis hardware models
Hardware inventory:
Item              Version   Part number   Serial number     FRU model number
Routing Engine 0            BUILTIN       BUILTIN
FPC 0             REV 02    711-032234    EC4074
Power Supply 0    PSMI 2C   11-d65800     --
```

show chassis hardware clei-models (QFX3500 Switches)

```
user@switch> show chassis hardware clei-models
Hardware inventory:
Item              Version   Part number   CLEI code         FRU model number
Routing Engine 0            BUILTIN
FPC 0             REV 02    711-032234
Power Supply 0    PSMI 2C   11-d65800
```

show chassis hardware clei-models (QFX5100 Switches)

```
user@switch> show chassis hardware clei-models
Hardware inventory:
Item              Version   Part number   CLEI code         FRU model number
Routing Engine 0            BUILTIN       CMMNV10BRA
FPC 0             REV 01    611-053010    CMMNV10BRA
  PIC 0                     BUILTIN       CMMNV10BRA
Power Supply 0    REV 03    740-053352    MUPABHBAA         JPSU-850W-AC-AFO
Power Supply 1    REV 03    740-053352    MUPABHBAA         JPSU-850W-AC-AFO
Fan Tray 0                                                  QFX5100-96S-FANAFO
Fan Tray 1                                                  QFX5100-96S-FANAFO
Fan Tray 2                                                  QFX5100-96S-FANAFO
```

show chassis hardware interconnect-device (QFabric Systems)

```
user@switch> show chassis hardware interconnect-device interconnect1
Hardware inventory:
Item              Version   Part number   Serial number     Description
Chassis           REV 07                                    QFX_olive
Midplane          REV 07    750-021261    BH0208188289      QFX Midplane
CB 0              REV 07    750-021261    BH0208188289      QFXIC08-CB4S
```

show chassis hardware node-device (QFabric Systems)

```
user@switch> show chassis hardware node-device node1
Routing Engine 0   BUILTIN      BUILTIN          QFX Routing Engine
node1             REV 05    711-032234    ED3694            QFX3500-48S4Q-AFI


  CPU                       BUILTIN       BUILTIN           FPC CPU
  PIC 0                     BUILTIN       BUILTIN           48x 10G-SFP+
    Xcvr 8        REV 01    740-030658    AD0946A028B       SFP+-10G-USR
...
```

show chassis hardware (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version   Part number   Serial number     Description
Chassis                                   JN11D1FD7AJA      PTX5000
Midplane          REV 03    711-031896    ABAC5589          Midplane-8S
FPM               REV 08    760-030647    EG1679            Front Panel Display
PDU 0             Rev 05    740-032019    ZE00006           DC Power Dist Unit
  PSM 0           Rev 05    740-032022    ZJ00018           DC 12V Power Supply
  PSM 1           Rev 04    740-032022    ZC00052           DC 12V Power Supply
  PSM 2           Rev 04    740-032022    ZD00051           DC 12V Power Supply
  PSM 3           Rev 05    740-032022    ZJ00060           DC 12V Power Supply
CCG 0             REV 04    750-030653    EG3703            Clock Generator
CCG 1             REV 04    750-030653    EG3698            Clock Generator
Routing Engine 0 REV 05     740-026942    P737A-002231      RE-DUO-2600
Routing Engine 1 REV 06     740-026942    P737A-002438      RE-DUO-2600
CB 0              REV 08    750-030625    EG5519            Control Board
CB 1              REV 08    750-030625    EG5516            Control Board
FPC 0             REV 18    750-036844    EJ3080            FPC
  CPU             REV 12    711-030686    EJ3260            SNG PMB
FPC 2             REV 13    750-036844    EG5065            FPC
  CPU             REV 09    711-030686    EG4082            SNG PMB
  PIC 0           REV 14    750-031913    EG5127            24x 10GE(LAN) SFP+
    Xcvr 0        REV 01    740-031980    143363A00240      SFP+-10G-SR
    Xcvr 1        REV 01    740-031981    UK90PZ1           SFP+-10G-LR
    Xcvr 2        REV 01    740-031980    AD1141A04XH       SFP+-10G-SR
    Xcvr 3        REV 01    740-031981    UK90Q46           SFP+-10G-LR
    Xcvr 4        REV 01    740-031980    AD1141A04X4       SFP+-10G-SR
    Xcvr 6        REV 01    740-031980    B11H02560         SFP+-10G-SR
    Xcvr 7        REV 01    740-031980    B11C01589         SFP+-10G-SR
    Xcvr 8        REV 01    740-031980    AD1141A04XF       SFP+-10G-SR
    Xcvr 10       REV 01    740-031980    123363A01094      SFP+-10G-SR
    Xcvr 11       REV 01    740-031980    AK80LKF           SFP+-10G-SR
    Xcvr 12       REV 01    740-031980    183363A01528      SFP+-10G-SR
    Xcvr 14       REV 01    740-031980    193363A01079      SFP+-10G-SR
    Xcvr 15       REV 01    740-031980    AK80MC8           SFP+-10G-SR
    Xcvr 16       REV 01    740-031980    AJC0BHC           SFP+-10G-SR
    Xcvr 19       REV 01    740-021309    J08D26856         SFP+-10G-LR
    Xcvr 21       REV 01    740-031980    AK80KCT           SFP+-10G-SR
    Xcvr 22       REV 01    740-031981    UK90PZL           SFP+-10G-LR
    Xcvr 23       REV 01    740-031980    AK80N1V           SFP+-10G-SR
FPC 3             REV 13    750-036844    EG5074            FPC
  CPU             REV 09    711-030686    EG4064            SNG PMB
  PIC 1           REV 10    750-031903    EG0325            SNG Load
FPC 5             REV 06    750-036844    EH3198            FPC
  CPU
  PIC 0           REV 14    750-031913    EG5134            24x 10GE(LAN) SFP+
    Xcvr 0        REV 01    740-031980    AK80LBH           SFP+-10G-SR
```

```
    Xcvr 1        REV 01   740-031980   B11B03724        SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AK80FMH          SFP+-10G-SR
    Xcvr 5        REV 01   740-031980   B11J00818        SFP+-10G-SR
    Xcvr 6        REV 01   740-031980   193363A00743     SFP+-10G-SR
    Xcvr 7        REV 01   740-031980   B11B06125        SFP+-10G-SR
    Xcvr 10       REV 01   740-031980   B11H02529        SFP+-10G-SR
    Xcvr 11       REV 01   740-031980   AK80LFB          SFP+-10G-SR
    Xcvr 12       REV 01   740-031980   193363A01061     SFP+-10G-SR
    Xcvr 15       REV 01   740-031980   B11J00687        SFP+-10G-SR
    Xcvr 16       REV 01   740-031980   193363A00738     SFP+-10G-SR
    Xcvr 18       REV 01   740-031980   AK80MQX          SFP+-10G-SR
    Xcvr 19       REV 01   740-021309   J08C17257        SFP+-10G-LR
    Xcvr 22       REV 01   740-031980   B11J00730        SFP+-10G-SR
    Xcvr 23       REV 01   740-031980   AK80KEE          SFP+-10G-SR
  PIC 1           REV 08   750-036710   EG3105           2x 40GE CFP
    Xcvr 0        REV 01   740-034554   B260HLT          CFP-40G-LR4
    Xcvr 1        REV 01   740-034554   B11C02847        CFP-40G-LR4
FPC 6             REV 18   750-036844   EJ4391           FPC
  CPU             REV 12   711-030686   EJ3257           SNG PMB
FPC 7             REV 18   750-036844   EJ4382           FPC
  CPU             REV 12   711-030686   EJ3238           SNG PMB
SPMB 0            REV 10   711-030686   EG5418           SNG PMB
SPMB 1            REV 09   711-030686   EG5373           SNG PMB
SIB 0             REV 07   750-030631   EG4858           SIB-I-8S
SIB 1             REV 07   750-030631   EG4872           SIB-I-8S
SIB 2             REV 07   750-030631   EG4866           SIB-I-8S
SIB 3             REV 07   750-030631   EG6011           SIB-I-8S
SIB 4             REV 07   750-030631   EG4907           SIB-I-8S
SIB 5             REV 07   750-030631   EG4879           SIB-I-8S
SIB 6             REV 07   750-030631   EG4864           SIB-I-8S
SIB 7             REV 07   750-030631   EG4899           SIB-I-8S
SIB 8             REV 07   750-030631   EG4880           SIB-I-8S
Fan Tray 0        REV 04   760-032784   EG1496           Vertical Fan Tray
Fan Tray 1        REV 04   760-030642   EG1335           Horizontal Fan Tray
Fan Tray 2        REV 02   760-030642   ED4952           Horizontal Fan Tray
```

show chassis hardware (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number    Description
Chassis                                 JN1204FC0AJA     PTX5000
Midplane          REV 11   750-035893   ACAB8038         Midplane-8S
FPM               REV 12   760-030647   BBBD5619         Front Panel
Display
PDU 0             Rev 04   740-048336   1GB93470043      High Capacity DC PDU
  PSM 0           Rev 04   740-046988   1GB63500184      High Capacity DC PSM
  PSM 2           Rev 04   740-046988   1GB63500169      High Capacity DC PSM
  PSM 4           Rev 04   740-046988   1GB63500306      High Capacity DC PSM
  PSM 6           Rev 04   740-046988   1GB63500074      High Capacity DC PSM
PDU 1             Rev 04   740-048336   1GB93470045      High Capacity DC PDU
  PSM 1           Rev 04   740-046988   1GB63500193      High Capacity DC PSM
  PSM 3           Rev 04   740-046988   1GB63500143      High Capacity DC PSM
  PSM 5           Rev 04   740-046988   1GB63500146      High Capacity DC PSM
  PSM 7           Rev 04   740-046988   1GB63500192      High Capacity DC PSM
CCG 0             REV 09   750-030653   BBBC1909         Clock Generator
CCG 1             REV 09   750-030653   BBBD2970         Clock Generator
...
```

show chassis hardware clei-models (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
FPM              REV 08   760-030647   PROTOXCLEI        CRAFT-PTX5000-S
PDU 0            Rev 05   740-032019   IPUPAHLKAA        PWR-SAN-PDU-DC
  PSM 0          Rev 05   740-032022   IPUPAHNKAA        PSM-PTX-DC-120-S
  PSM 1          Rev 04   740-032022   032022XXXX        PWR-SAN-12-DC
  PSM 2          Rev 04   740-032022   032022XXXX        PWR-SAN-12-DC
  PSM 3          Rev 05   740-032022   IPUPAHNKAA        PSM-PTX-DC-120-S
CCG 0            REV 04   750-030653   PROTOXCLEI        CCG-PTX-S
CCG 1            REV 04   750-030653   PROTOXCLEI        CCG-PTX-S
Routing Engine 0 REV 05   740-026942                     RE-DUO-C2600-16G-S
Routing Engine 1 REV 06   740-026942                     RE-DUO-C2600-16G-S
CB 0             REV 08   750-030625   PROTOXCLEI        CB-PTX-S
CB 1             REV 08   750-030625   PROTOXCLEI        CB-PTX-S
FPC 0            REV 18   750-036844   PROTOXCLEI        FPC-PTX-P1-A
FPC 2            REV 13   750-036844   PROTOXCLEI        FPC-PTX-P1-A
  PIC 0          REV 14   750-031913   PROTOXCLEI        P1-PTX-24-10GE-SFPP
FPC 3            REV 13   750-036844   PROTOXCLEI        FPC-PTX-P1-A
FPC 5
  PIC 0          REV 14   750-031913   PROTOXCLEI        P1-PTX-24-10GE-SFPP
FPC 6            REV 18   750-036844   PROTOXCLEI        FPC-PTX-P1-A
FPC 7            REV 18   750-036844   PROTOXCLEI        FPC-PTX-P1-A
SIB 0            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 1            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 2            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 3            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 4            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 5            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 6            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 7            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 8            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
Fan Tray 1       REV 04   760-030642   PROTOXCLEI        FAN-PTX-H-S
```

show chassis hardware clei-models (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 11   750-035893   IPMUN00ARA        CHAS-MP-PTX5000-S
FPM              REV 12   760-030647   IPUCA7SCAA        CRAFT-PTX5000-S
PDU 0            Rev 04   740-048336   IPUPAL7KAA        PDU2-PTX-DC-S
  PSM 0          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 2          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 4          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 6          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
PDU 1            Rev 04   740-048336   IPUPAL7KAA        PDU2-PTX-DC-S
  PSM 1          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 3          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 5          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 7          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
CCG 0            REV 09   750-030653   IPUCA7DCAA        CCG-PTX-S
CCG 1            REV 09   750-030653   IPUCA7DCAA        CCG-PTX-S
...
```

show chassis hardware detail (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware detail
```



```
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11D1FD7AJA      PTX5000
Midplane         REV 03   711-031896   ABAC5589          Midplane-8S
FPM              REV 08   760-030647   EG1679            Front Panel Display
PDU 0            Rev 05   740-032019   ZE00006           DC Power Dist Unit
  PSM 0          Rev 05   740-032022   ZJ00018           DC 12V Power Supply
  PSM 1          Rev 04   740-032022   ZC00052           DC 12V Power Supply
  PSM 2          Rev 04   740-032022   ZD00051           DC 12V Power Supply
  PSM 3          Rev 05   740-032022   ZJ00060           DC 12V Power Supply
CCG 0            REV 04   750-030653   EG3703            Clock Generator
CCG 1            REV 04   750-030653   EG3698            Clock Generator
Routing Engine 0 REV 05   740-026942   P737A-002231      RE-DUO-2600
  ad0    3823 MB  SMART CF             201006190039C02DC02D Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 2011042300CF4C6B4C6B Disk 1
Routing Engine 1 REV 06   740-026942   P737A-002438      RE-DUO-2600
  ad0    3823 MB  SMART CF             20100619053455F055F0 Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 20110423000AE8E7E8E7 Disk 1
CB 0             REV 08   750-030625   EG5519            Control Board
CB 1             REV 08   750-030625   EG5516            Control Board
FPC 0            REV 18   750-036844   EJ3080            FPC
  CPU            REV 12   711-030686   EJ3260            SNG PMB
FPC 2            REV 13   750-036844   EG5065            FPC
  CPU            REV 09   711-030686   EG4082            SNG PMB
  PIC 0          REV 14   750-031913   EG5127            24x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   143363A00240      SFP+-10G-SR
    Xcvr 1       REV 01   740-031981   UK90PZ1           SFP+-10G-LR
    Xcvr 2       REV 01   740-031980   AD1141A04XH       SFP+-10G-SR
    Xcvr 3       REV 01   740-031981   UK90Q46           SFP+-10G-LR
    Xcvr 4       REV 01   740-031980   AD1141A04X4       SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11H02560         SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11C01589         SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AD1141A04XF       SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   123363A01094      SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AK80LKF           SFP+-10G-SR
    Xcvr 12      REV 01   740-031980   183363A01528      SFP+-10G-SR
    Xcvr 14      REV 01   740-031980   193363A01079      SFP+-10G-SR
    Xcvr 15      REV 01   740-031980   AK80MC8           SFP+-10G-SR
    Xcvr 16      REV 01   740-031980   AJC0BHC           SFP+-10G-SR
    Xcvr 19      REV 01   740-021309   J08D26856         SFP+-10G-LR
    Xcvr 21      REV 01   740-031980   AK80KCT           SFP+-10G-SR
    Xcvr 22      REV 01   740-031981   UK90PZL           SFP+-10G-LR
    Xcvr 23      REV 01   740-031980   AK80N1V           SFP+-10G-SR
FPC 3            REV 13   750-036844   EG5074            FPC
  CPU            REV 09   711-030686   EG4064            SNG PMB
  PIC 1          REV 10   750-031903   EG0325            SNG Load
FPC 5            REV 06   750-036844   EH3198            FPC
  CPU
  PIC 0          REV 14   750-031913   EG5134            24x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LBH           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11B03724         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80FMH           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   B11J00818         SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00743      SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11B06125         SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   B11H02529         SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AK80LFB           SFP+-10G-SR
    Xcvr 12      REV 01   740-031980   193363A01061      SFP+-10G-SR
    Xcvr 15      REV 01   740-031980   B11J00687         SFP+-10G-SR
    Xcvr 16      REV 01   740-031980   193363A00738      SFP+-10G-SR
    Xcvr 18      REV 01   740-031980   AK80MQX           SFP+-10G-SR
```

```
      Xcvr 19          REV 01    740-021309    J08C17257        SFP+-10G-LR
      Xcvr 22          REV 01    740-031980    B11J00730        SFP+-10G-SR
      Xcvr 23          REV 01    740-031980    AK80KEE          SFP+-10G-SR
    PIC 1              REV 08    750-036710    EG3105           2x 40GE CFP
      Xcvr 0           REV 01    740-034554    B260HLT          CFP-40G-LR4
      Xcvr 1           REV 01    740-034554    B11C02847        CFP-40G-LR4
FPC 6                  REV 18    750-036844    EJ4391           FPC
  CPU                  REV 12    711-030686    EJ3257           SNG PMB
FPC 7                  REV 18    750-036844    EJ4382           FPC
  CPU                  REV 12    711-030686    EJ3238           SNG PMB
SPMB 0                 REV 10    711-030686    EG5418           SNG PMB
SPMB 1                 REV 09    711-030686    EG5373           SNG PMB
SIB 0                  REV 07    750-030631    EG4858           SIB-I-8S
SIB 1                  REV 07    750-030631    EG4872           SIB-I-8S
SIB 2                  REV 07    750-030631    EG4866           SIB-I-8S
SIB 3                  REV 07    750-030631    EG6011           SIB-I-8S
SIB 4                  REV 07    750-030631    EG4907           SIB-I-8S
SIB 5                  REV 07    750-030631    EG4879           SIB-I-8S
SIB 6                  REV 07    750-030631    EG4864           SIB-I-8S
SIB 7                  REV 07    750-030631    EG4899           SIB-I-8S
SIB 8                  REV 07    750-030631    EG4880           SIB-I-8S
Fan Tray 0             REV 04    760-032784    EG1496           Vertical Fan Tray
Fan Tray 1             REV 04    760-030642    EG1335           Horizontal Fan Tray
Fan Tray 2             REV 02    760-030642    ED4952           Horizontal Fan Tray
```

show chassis hardware detail (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis hardware detail
Hardware inventory:
Item                   Version   Part number   Serial number    Description
Chassis                                        JN1204FC0AJA     PTX5000
Midplane               REV 11    750-035893    ACAB8038         Midplane-8S
FPM                    REV 12    760-030647    BBBD5619         Front Panel
Display
PDU 0                  Rev 04    740-048336    1GB93470043      High Capacity DC PDU
  PSM 0                Rev 04    740-046988    1GB63500184      High Capacity DC PSM
  PSM 2                Rev 04    740-046988    1GB63500169      High Capacity DC PSM
  PSM 4                Rev 04    740-046988    1GB63500306      High Capacity DC PSM
  PSM 6                Rev 04    740-046988    1GB63500074      High Capacity DC PSM
PDU 1                  Rev 04    740-048336    1GB93470045      High Capacity DC PDU
  PSM 1                Rev 04    740-046988    1GB63500193      High Capacity DC PSM
  PSM 3                Rev 04    740-046988    1GB63500143      High Capacity DC PSM
  PSM 5                Rev 04    740-046988    1GB63500146      High Capacity DC PSM
  PSM 7                Rev 04    740-046988    1GB63500192      High Capacity DC PSM
CCG 0                  REV 09    750-030653    BBBC1909         Clock Generator
CCG 1                  REV 09    750-030653    BBBD2970         Clock Generator
...
```

show chassis hardware models (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware models
Hardware inventory:
Item                   Version   Part number   Serial number    FRU model number
FPM                    REV 08    760-030647    EG1679           CRAFT-PTX5000-S
PDU 0                  Rev 05    740-032019    ZE00006          PWR-SAN-PDU-DC
  PSM 0                Rev 05    740-032022    ZJ00018          PSM-PTX-DC-120-S
  PSM 1                Rev 04    740-032022    ZC00052          PWR-SAN-12-DC
  PSM 2                Rev 04    740-032022    ZD00051          PWR-SAN-12-DC
  PSM 3                Rev 05    740-032022    ZJ00060          PSM-PTX-DC-120-S
CCG 0                  REV 04    750-030653    EG3703           CCG-PTX-S
CCG 1                  REV 04    750-030653    EG3698           CCG-PTX-S
```



```
Routing Engine 0 REV 05   740-026942   P737A-002231      RE-DUO-C2600-16G-S
Routing Engine 1 REV 06   740-026942   P737A-002438      RE-DUO-C2600-16G-S
CB 0             REV 08   750-030625   EG5519            CB-PTX-S
CB 1             REV 08   750-030625   EG5516            CB-PTX-S
FPC 0            REV 18   750-036844   EJ3080            FPC-PTX-P1-A
FPC 2            REV 13   750-036844   EG5065            FPC-PTX-P1-A
  PIC 0          REV 14   750-031913   EG5127            P1-PTX-24-10GE-SFPP
FPC 3            REV 13   750-036844   EG5074            FPC-PTX-P1-A
FPC 5
  PIC 0          REV 14   750-031913   EG5134            P1-PTX-24-10GE-SFPP
FPC 6            REV 18   750-036844   EJ4391            FPC-PTX-P1-A
FPC 7            REV 18   750-036844   EJ4382            FPC-PTX-P1-A
SIB 0            REV 07   750-030631   EG4858            SIB-I-PTX5008
SIB 1            REV 07   750-030631   EG4872            SIB-I-PTX5008
SIB 2            REV 07   750-030631   EG4866            SIB-I-PTX5008
SIB 3            REV 07   750-030631   EG6011            SIB-I-PTX5008
SIB 4            REV 07   750-030631   EG4907            SIB-I-PTX5008
SIB 5            REV 07   750-030631   EG4879            SIB-I-PTX5008
SIB 6            REV 07   750-030631   EG4864            SIB-I-PTX5008
SIB 7            REV 07   750-030631   EG4899            SIB-I-PTX5008
SIB 8            REV 07   750-030631   EG4880            SIB-I-PTX5008
Fan Tray 1       REV 04   760-030642   EG1335            FAN-PTX-H-S
```

show chassis hardware models (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 11   750-035893   ACAB8038          CHAS-MP-PTX5000-S
FPM              REV 12   760-030647   BBBD5619          CRAFT-PTX5000-S
PDU 0            Rev 04   740-048336   1GB93470043       PDU2-PTX-DC-S
  PSM 0          Rev 04   740-046988   1GB63500184       PSM2-PTX-DC-S
  PSM 2          Rev 04   740-046988   1GB63500169       PSM2-PTX-DC-S
  PSM 4          Rev 04   740-046988   1GB63500306       PSM2-PTX-DC-S
  PSM 6          Rev 04   740-046988   1GB63500074       PSM2-PTX-DC-S
PDU 1            Rev 04   740-048336   1GB93470045       PDU2-PTX-DC-S
  PSM 1          Rev 04   740-046988   1GB63500193       PSM2-PTX-DC-S
  PSM 3          Rev 04   740-046988   1GB63500143       PSM2-PTX-DC-S
  PSM 5          Rev 04   740-046988   1GB63500146       PSM2-PTX-DC-S
  PSM 7          Rev 04   740-046988   1GB63500192       PSM2-PTX-DC-S
CCG 0            REV 09   750-030653   BBBC1909          CCG-PTX-S
CCG 1            REV 09   750-030653   BBBD2970          CCG-PTX-S
...
```

show chassis hardware extensive (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
...............
PDU 0            Rev 04   740-032019   UE0003            DC Power Dist Unit
 Jedec Code:    0x7fb0           EEPROM Version:    0x02
 P/N:           740-032019       S/N:               UE0003
 Assembly ID:   0x043d           Assembly Version:  04.00
 Date:          11-29-2010       Assembly Flags:    0x00
 Version:       Rev 04           CLEI Code:         032022XXXX
 ID: DC Power Dist Unit          FRU Model Number:  PWR-SAN-PDU-DC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 3d 04 00 52 65 76 20 30 34 00 00
```

```
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 32 30 31 39 00 00
  Address 0x20: 53 2f 4e 20 55 45 30 30 30 33 00 00 00 1d 0b 07
  Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 30 33 32 30 32 32 58 58 58 58 50
  Address 0x50: 57 52 2d 53 41 4e 2d 50 44 55 2d 44 43 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 a3 ff ff ff ff ff ff ff ff ff ff ff ff
  PSM 0          Rev 04   740-032022   YG00065          DC 12V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-032022       S/N:               YG00065
 Assembly ID:  0x0440           Assembly Version:  04.00
 Date:         07-30-2010       Assembly Flags:    0x00
 Version:      Rev 04           CLEI Code:         032022XXXX
 ID: DC 12V Power Supply Module FRU Model Number:  PWR-SAN-12-DC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 40 04 00 52 65 76 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 32 30 32 32 00 00
  Address 0x20: 53 2f 4e 20 59 47 30 30 30 36 35 00 00 1e 07 07
  Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 30 33 32 30 32 32 58 58 58 58 50
  Address 0x50: 57 52 2d 53 41 4e 2d 31 32 2d 44 43 20 20 20 20
  Address 0x60: 20 20 20 20 20 20 01 00 ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 0c ff ff ff ff ff ff ff ff ff ff ff ff
```

show chassis hardware (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1100FB1AFB      MX480
Midplane         REV 05   710-017414   TR3310            MX480 Midplane
FPM Board        REV 02   710-017254   KG1872            Front Panel Display
PEM 2            Rev 02   740-017343   QCS0812A00N       DC Power Entry Module
PEM 3            Rev 02   740-017343   QCS0812A00U       DC Power Entry Module
Routing Engine 0 REV 07   740-015113   1000740938        RE-S-1300
CB 0             REV 03   710-021523   KF4630            MX SCB
FPC 1            REV 11   750-037207   ZW9726            AS-MCC
  CPU            REV 04   711-038173   ZW4819            AS-MCC PMB
  MIC 0          REV 06   750-037214   ZW3574            AS-MSC
    PIC 0                 BUILTIN      BUILTIN           AS-MSC
  MIC 1          REV 00   750-037211                     AS-MXC
    PIC 2                 BUILTIN      BUILTIN           AS-MXC
```

show chassis hardware extensive (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis hardware extensive
FPC 1            REV 11   750-037207   ZW9726            AS-MCC
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          750-037207       S/N:               ZW9726
 Assembly ID:  0x0b37           Assembly Version:  01.11
 Date:         02-17-2012       Assembly Flags:    0x00
 Version:      REV 11           CLEI Code:         PROTOXCLEI
 ID: AS-MCC          FRU Model Number:  750-037207
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 37 01 0b 52 45 56 20 31 31 00 00
```



```
 Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 30 37 00 00
 Address 0x20: 53 2f 4e 20 5a 57 39 37 32 36 00 00 00 11 02 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
 Address 0x50: 35 30 2d 30 33 37 32 30 37 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 31 31 00 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 5e ff ff ff ff ff ff ff ff ff ff ff ff
 CPU           REV 04   711-038173   ZW4819           AS-MCC-PMB
Jedec Code:   0x7fb0           EEPROM Version:    0x02
P/N:          711-038173       S/N:               ZW4819
Assembly ID:  0x0b38           Assembly Version:  01.04
Date:         12-30-2011       Assembly Flags:    0x00
Version:      REV 04
ID: AS-MCC PMB
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 0b 38 01 04 52 45 56 20 30 34 00 00
 Address 0x10: 00 00 00 00 37 31 31 2d 30 33 38 31 37 33 00 00
 Address 0x20: 53 2f 4e 20 5a 57 34 38 31 39 00 00 00 1e 0c 07
 Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 37
 Address 0x50: 31 31 2d 30 33 38 31 37 33 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 30 34 00 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 60 00 00 00 00 00 00 00 00 00 00 00 00
 MIC 0         REV 06   750-037214   ZW3574           AS-MSC
Jedec Code:   0x7fb0           EEPROM Version:    0x02
P/N:          750-037214       S/N:               ZW3574
Assembly ID:  0x0a44           Assembly Version:  01.06
Date:         02-19-2012       Assembly Flags:    0x00
Version:      REV 06           CLEI Code:         PROTOXCLEI
ID: AS-MSC          FRU Model Number:  750-037214
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 0a 44 01 06 52 45 56 20 30 36 00 00
 Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 34 00 00
 Address 0x20: 53 2f 4e 20 5a 57 33 35 37 34 00 00 00 13 02 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
 Address 0x50: 35 30 2d 30 33 37 32 31 34 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 30 36 00 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 60 c0 03 e5 f4 00 00 00 00 00 00 00 00
   PIC 0                BUILTIN      BUILTIN          AS-MSC
 MIC 1         REV 00   750-037211                    AS-MXC
Jedec Code:   0x7fb0           EEPROM Version:    0x01
P/N:          750-037211
Assembly ID:  0x0a43           Assembly Version:  01.00
Date:         255-255-65535    Assembly Flags:    0x00
Version:      REV 00
ID: AS-MXC
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 0a 43 01 00 52 45 56 20 30 30 00 00
 Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 31 00 00
 Address 0x20: 00 00 00 00 00 00 00 00 00 00 00 00 00 ff ff ff
 Address 0x30: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
 Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

```
  Address 0x70: ff ff ff ff c0 02 e6 6c 7f b0 02 ff 0a 44 01 06
    PIC 2                 BUILTIN      BUILTIN           AS-MXC
```

show chassis hardware (QFX3500 Switch running Enhanced Layer 2 Software)

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                P3566             QFX3500
Pseudo CB 0
Routing Engine 0          BUILTIN      BUILTIN           QFX Routing Engine
FPC 0            REV 16   750-036931   P3566-C           QFX3500-48S4Q
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           48x 10G-SFP+
    Xcvr 12      REV 01   740-030658   AD1125A0438       SFP+-10G-USR
    Xcvr 13      REV 01   740-030658   AD1125A02GN       SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 40G-QSFP+
  PIC 2
  MGMT BRD       REV 10   750-036946   BBAW0328          QFX3500-MGMT-RJ45-AFI
Power Supply 0   Rev 05   740-032091   WA13035           JPSU-650W-AC-AFI
Power Supply 1
Fan Tray 0                                              QFX3500 Fan Tray, Front
 to Back Airflow
Fan Tray 1                                              QFX3500 Fan Tray, Front
 to Back Airflow
Fan Tray 2                                              QFX3500 Fan Tray, Front
 to Back Airflow
```

show chassis hardware (QFX5100 Switch running Enhanced Layer 2 Software)

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                TB3113280048      QFX5100-24Q-2P
Pseudo CB 0
Routing Engine 0          BUILTIN      BUILTIN           QFX Routing Engine
FPC 0            REV 02   650-049942   TB3113280048      QFX5100-24Q-2P
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           24x 40G-QSFP
    Xcvr 8       REV 01   740-032986   QA470143          QSFP+-40G-SR4
    Xcvr 14      REV 01   740-032986   QB500525          QSFP+-40G-SR4
  PIC 1          REV 02   611-049555   RR3113310169      QFX-EM-4Q
    Xcvr 0       REV 01   740-032986   QC440904          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-032986   QB240154          QSFP+-40G-SR4
    Xcvr 2       REV 01   740-035085   018110105         QSFP+-40G-LPBK
  PIC 2          REV 02   611-049555   RR3113310209      QFX-EM-4Q
    Xcvr 0       REV 01   740-032986   QB190270          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-035085   018110063         QSFP+-40G-LPBK
    Xcvr 2       REV 01   740-032986   QB210034          QSFP+-40G-SR4
Power Supply 0   REV 03   740-041741   1GA23110973        JPSU-650W-AC-AFO
Power Supply 1   REV 03   740-041741   1GA23090878        JPSU-650W-AC-AFO
Fan Tray 0                                            QFX5100 Fan Tray 0, Front
 to Back Airflow - AFO
Fan Tray 1                                            QFX5100 Fan Tray 1, Front
 to Back Airflow - AFO
Fan Tray 2                                            QFX5100 Fan Tray 2, Front
 to Back Airflow - AFO
Fan Tray 3                                            QFX5100 Fan Tray 3, Front
 to Back Airflow - AFO
```



```
Fan Tray 4                                           QFX5100 Fan Tray 4, Front
 to Back Airflow - AFO
```

show chassis in-service-upgrade

Syntax **show chassis in-service-upgrade**

Release Information Command introduced in Junos OS Release 9.0.
Command introduced in Junos OS Release 12.3R2, 13.1R2, and 13.2R1 for TX Matrix Plus routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for PTX5000 routers.
Command introduced in Junos OS Release 13.2X51-D15 for the QFX Series.

Description Display the status of Flexible PIC Concentrators (FPCs) and their corresponding PICs after the most recent unified in-service software upgrade (ISSU). This command must be issued on the master Routing Engine.

NOTE: Only Intelligent Queuing (IQ) PICs are displayed by this command output. Unified ISSU status for other PIC types is controlled internally by the FPC.

Options This command has no options.

Required Privilege Level view

Related Documentation

- *request system software abort*
- *request system software in-service-upgrade*
- *Unified ISSU Concepts*
- *Performing a Unified ISSU*

List of Sample Output

show chassis in-service-upgrade on page 1429
show chassis in-service-upgrade (MX2010 Router) on page 1429
show chassis in-service-upgrade (MX2020 Router) on page 1429
show chassis in-service-upgrade (TX Matrix Plus Router) on page 1430
show chassis in-service-upgrade (QFX5100 Switch) on page 1431

Output Fields Table 91 on page 1428 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 91: show chassis in-service-upgrade Output Fields

Field Name	Field Description
Item	Flexible PIC Concentrator (FPC) slot number.

Table 91: show chassis in-service-upgrade Output Fields *(continued)*

Field Name	Field Description
Status	FPC and corresponding PIC state. State can be either of the follwing: • **Online**—FPC is online and running. • **Offline**—FPC is powered down.
Reason	Reason for the state (if offline).

Sample Output

show chassis in-service-upgrade

```
user@host> show chassis in-service-upgrade
  Item           Status                  Reason
  FPC 0          Online
  FPC 1          Online
  FPC 2          Online
    PIC 0        Online
    PIC 1        Online
  FPC 3          Offline                Offlined by CLI command

  FPC 4          Online
    PIC 1        Online
  FPC 5          Online
    PIC 0        Online
  FPC 6          Online
    PIC 3        Online
  FPC 7          Online
```

show chassis in-service-upgrade (MX2010 Router)

```
user@host> show chassis in-service-upgrade
Item           Status                  Reason
  FPC 0          Online
  FPC 1          Online
  FPC 8          Online
  FPC 9          Online
```

show chassis in-service-upgrade (MX2020 Router)

```
user@host> show chassis in-service-upgrade
  Item           Status                  Reason
  FPC 0          Online
  FPC 1          Online
  FPC 2          Online
  FPC 3          Online
  FPC 4          Online
  FPC 5          Online
  FPC 6          Online
  FPC 7          Online
  FPC 8          Online
  FPC 9          Online
  FPC 10         Online
  FPC 11         Online
  FPC 12         Online
  FPC 13         Online
```

```
  FPC 14         Online
  FPC 15         Online
  FPC 16         Online
  FPC 17         Online
  FPC 18         Online
  FPC 19         Online
```

show chassis in-service-upgrade (TX Matrix Plus Router)

```
user@host> show chassis in-service-upgrade
lcc0-re0:
--------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 1          Online
    PIC 0        Online
  FPC 2          Online
  FPC 3          Online
    PIC 1        Online
  FPC 4          Online
  FPC 6          Online
  FPC 7          Online

lcc1-re0:
--------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online
    PIC 3        Online
  FPC 1          Online
  FPC 2          Online
  FPC 4          Online
  FPC 6          Online
  FPC 7          Online

lcc2-re0:
--------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online
  FPC 2          Online
  FPC 3          Online
    PIC 0        Online
  FPC 4          Online
  FPC 6          Online
  FPC 7          Online
    PIC 1        Online

lcc3-re0:
--------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online
    PIC 0        Online
  FPC 1          Online
  FPC 2          Online
  FPC 3          Online
    PIC 2        Online
  FPC 4          Online
  FPC 5          Online
  FPC 6          Online
  FPC 7          Online
    PIC 1        Online
```

show chassis in-service-upgrade (QFX5100 Switch)

```
user@switch> show chassis in-service-upgrade
  Item           Status                  Reason
  FPC 0          Online (ISSU)
```

show chassis lccs

Syntax show chassis lccs

Release Information Command introduced before Junos OS Release 7.4.

Description (TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, display the status of all T640 LCC connected to the TX Matrix router. On a TX Matrix Plus router, display the status of all LCC connected to the TX Matrix Plus router.

Options This command has no options.

Required Privilege Level view

Related Documentation

- request chassis lcc on page 637
- *Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)*
- *fpc*

List of Sample Output

show chassis lccs on page 1432
show chassis lccs (TX Matrix Plus router with 3D SIBs) on page 1433

Output Fields Table 92 on page 1432 lists the output fields for the **show chassis lccs** command. Output fields are listed in the approximate order in which they appear.

Table 92: show chassis lccs Output Fields

Field Name	Field Description
Slot	LCC slot number.
State	LCC status: • **Online**—LCC is online and running. • **Offline**—LCC is powered down. • **Empty**—No LCC is present.
Uptime	How long the LCC has been up and running.

Sample Output

show chassis lccs

```
user@host> show chassis lccs
Slot  State               Uptime
 0    Online             3 minutes, 17 seconds
 1    Empty
 2    Online             3 minutes, 23 seconds
 3    Empty
```

show chassis lccs (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis lccs
Slot  State              Uptime
 0    Offline
 1    Empty
 2    Online            1 day, 4 hours, 57 minutes, 7 seconds
 3    Empty
 4    Online            1 day, 4 hours, 56 minutes, 58 seconds
 5    Empty
 6    Empty
 7    Online            3 hours, 45 minutes, 41 seconds
```


show chassis lcc-mode

Syntax show chassis lcc-mode

Release Information Command introduced in Junos OS Release 13.1.

Description (TX Matrix Plus routers only) Display the mode in which LCCs are connected to a TX Matrix Plus router.

NOTE: This command is supported only on TX Matrix Plus routers with 3D SIBs.

Options This command has no options.

Required Privilege Level view

Related Documentation

- lcc-mode on page 515
- *Routing Matrix with a TXP-Mixed-LCC-3D Configuration*

List of Sample Output show chassis lcc-mode (TX Matrix Plus Router with 3D SIBs) on page 1434

Output Fields Table 93 on page 1434 lists the output fields for the **show chassis lcc-mode** command. Output fields are listed in the approximate order in which they appear.

Table 93: show chassis lcc-mode Output Fields

Field Name	Field Description
Slot	The LCC number.
LCC-mode	Displays the mode of the LCC: • **T1600**—LCC functions as a T1600 router. • **T4000**—LCC functions as a T4000 router. • **EMPTY**—LCC is not configured as either a T1600 or a T4000 router.

Sample Output

show chassis lcc-mode (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis lcc-mode

Slot          LCC-mode
 0            T4000
 1            EMPTY
 2            T4000
 3            EMPTY
```



```
4                T4000
5                EMPTY
6                T1600
7                EMPTY
```

show chassis location

List of Syntax

Syntax

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*>

Syntax (OCX Series)

show chassis location

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the physical location of the chassis. This command can only be used on the master Routing Engine.

Options

none—Display all information about the physical location of the chassis. On a TX Matrix router, display all information about the physical location of the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display all information about the physical location of the TX Matrix Plus router and its attached routers.

all-members—(MX Series routers only) (Optional) Display the physical location of the chassis for all the member routers in the Virtual Chassis configuration.

fpc—(TX Matrix router and TX Matrix Plus router only) (Optional) Display the physical location of all Flexible PIC Concentrators (FPCs).

interconnect-device *name*—(QFabric systems only) (Optional) Display the physical location of the Interconnect device.

interface by-name *name*—(TX Matrix and TX Matrix Plus routers only) (Optional) Display the physical location of a specified interface name. On a TX Matrix router, this option displays the FPC number and T640 router (line-card chassis) number associated with the specified interface. On a TX Matrix Plus router, this option displays the FPC number and router (line-card chassis) number associated with the specified interface.

interface by-slot fpc *number* lcc *number*—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix router, display the global FPC number of an interface by specifying its local FPC number and T640 router (line-card chassis) number. On a TX Matrix Plus router, display the global FPC number of an interface by specifying its local FPC number and router (line-card chassis) number.

- The global FPC number is the FPC slot number when all the FPC slots in the routing matrix are considered: **0** through **31**. On TX Matrix Plus router with 3D SIBs, the value is **0** through **63**. The local FPC number is the FPC slot number on a particular T640 router.
- For **fpc**, replace ***number*** with a value from **0** through **7**.
- For **lcc**, replace ***number*** with a value from **0** through **7**.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the physical location of a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router , display the physical location of a specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display the physical location of the chassis for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display the physical location of the chassis for the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device *name*—(QFabric systems only) (Optional) Display the physical location of the Node device.

scc—(TX Matrix routers only) (Optional) Display the physical location of the TX Matrix router (switch-card chassis).

sfc—(TX Matrix Plus routers only) (Optional) Display the physical location of the TX Matrix Plus router (or switch-fabric chassis).

Required Privilege Level view

Related Documentation

- *Displaying Chassis Physical Locations for a Routing Matrix with a TX Matrix Plus Router*

List of Sample Output

Output Fields Table 94 on page 1438 lists the output fields for the **show chassis location** command. Output fields are listed in the approximate order in which they appear.

Table 94: show chassis location Output Fields

Field Name	Field Description
country-code	Country code information.
postal-code	Postal code information.
Building	Building information.
Floor	Floor information.
Global FPC	Global FPC number. The FPC slot number, when all FPC slots in the routing matrix are considered. The range of values is **0** through **31**. On TX Matrix Plus router with 3D SIBs the value is **0** through **63**.
LATA	Local access transport area information.
LCC	Line-card chassis number. On a TX Matrix router, the number of a particular T640 router connected to the TX Matrix router. On a TX Matrix Plus router, the number of a particular router connected to the TX Matrix Plus router.
Local FPC	Local FPC number. On a TX Matrix router, the FPC slot number on a particular T640 router. On a TX Matrix Plus router, the FPC slot number on a particular router.

Sample Output

show chassis location

`user@host>` **show chassis location**


```
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2
```

show chassis location fpc (TX Matrix Router)

```
user@host> show chassis location fpc
Global FPC    LCC     Local FPC
    17          2         1
    21          2         5
```

show chassis location interface by-slot (TX Matrix Router)

```
user@host> show chassis location interface by-slot fpc 1 lcc 1
Global FPC: 9
```

show chassis location fpc (TX Matrix Plus Router)

```
user@host> show chassis location fpc
Global FPC    LCC     Local FPC
     0          0         0
     1          0         1
```

show chassis location interface by-slot (TX Matrix Plus Router)

```
user@host> show chassis location interface by-slot fpc 2 lcc 1
Global FPC: 10
```

show chassis location (QFX Series and OCX Series)

```
user@switch> show chassis location
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2
```

show chassis location (QFabric Systems)

```
user@switch> show chassis location interconnect-device interconnect1
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2
```

show chassis mac-addresses

List of Syntax

Syntax on page 1440
Syntax (TX Matrix Router) on page 1440
Syntax (TX Matrix Plus Router) on page 1440
Syntax (MX Series Router) on page 1440
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 1440
Syntax (QFX Series) on page 1440
Syntax (OCX Series) on page 1440
Syntax (ACX Series Universal Access Routers) on page 1440

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 (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis mac-addresses

Syntax (QFX Series)

show chassis mac-addresses
<interconnect-device *name*>
<node-group *name*>

Syntax (OCX Series)

show chassis mac-addresses

Syntax (ACX Series Universal Access Routers)

show chassis mac-addresses

Release Information

Command introduced before JUNOS Release 7.4.
Command introduced in JUNOS Release 9.0 for EX Series switches.
sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6.
Command introduced in Junos OS Release 11.1 for QFX Series.
Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the media access control (MAC) addresses for the router, switch chassis, or switch.

Options

none—(TX Matrix, TX Matrix Plus routers, QFX Series, and OCX Series Switches) Display the MAC addresses for the router chassis or switch. On a TX Matrix router, display MAC addresses on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display MAC addresses on the TX Matrix Plus router and its attached routers.

all-members—(MX Series routers only) (Optional) Display the MAC addresses for all the member routers of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display the MAC addresses for the Interconnect device.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display MAC addresses for a specified T640 router (line-card chassis) that is connected to the TX Matrix Plus router. On a TX Matrix Plus router, display MAC addresses for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display the MAC addresses for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display the MAC addresses for the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-group *name*—(QFabric systems only) (Optional) Display the MAC addresses for the specified Node group.

scc—(TX Matrix routers only) (Optional) Display MAC addresses for the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display MAC addresses for the TX Matrix Plus router (or switch-fabric chassis).

Required Privilege Level

view

Related Documentation

- *ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping*

List of Sample Output

Output Fields

Table 95 on page 1442 lists the output fields for the **show chassis mac-addresses** command. Output fields are listed in the approximate order in which they appear.

Table 95: show chassis mac-addresses Output Fields

Field Name	Field Description
MAC address information	
Public base address	Base address of the MAC addresses allocated to this router or switch.
Public count	Number of allocated public addresses.
Private base address	Base address of the private MAC addresses allocated to this router or switch.
Private count	Number of allocated private addresses.

Sample Output

show chassis mac-addresses

```
user@host> show chassis mac-addresses
MAC address information
  Public base address   0:90:69:0:4:0
  Public count       1008
  Private base address   0:90:69:0:7:f0
  Private count       16
```

show chassis mac-addresses (MX104 Router)

```
user@host > show chassis mac-addresses
MAC address information:
  Public base address      b0:a8:6e:a1:e8:58
  Public count             2032
  Private base address     b0:a8:6e:a1:f0:48
  Private count            16
```

show chassis mac-addresses (MX2010 Router)

```
user@host> show chassis mac-addresses
MAC address information:
  Public base address      64:87:88:04:50:00
  Public count             1984
```

```
  Private base address    64:87:88:04:57:c0
  Private count           64
```

show chassis mac-addresses (MX2020 Router)

```
user@host> show chassis mac-addresses
MAC address information:
  Public base address     2c:21:72:70:20:00
  Public count            4032
  Private base address    2c:21:72:70:2f:c0
  Private count           64
```

show chassis mac-addresses (TX Matrix Router)

```
user@host> show chassis mac-addresses
scc-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:05:85:9e:cc:00
  Public count            8064
  Private base address    00:05:85:9e:eb:80
  Private count           128
lcc0-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:05:85:68:98:00
  Public count            2032
  Private base address    00:05:85:68:9f:f0
  Private count           16
lcc2-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:05:85:68:78:00
  Public count            2032
  Private base address    00:05:85:68:7f:f0
  Private count           16
```

show chassis mac-addresses (TX Matrix Plus Router)

```
user@host> show chassis mac-addresses
sfc0-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:1d:b5:14:00:00
  Public count            65023
  Private base address    00:1d:b5:14:fd:ff
  Private count           512

lcc0-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:1f:12:7a:84:00
  Public count            2032
  Private base address    00:1f:12:7a:8b:f0
  Private count           16

lcc1-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:22:83:42:48:00
  Public count            2032
  Private base address    00:22:83:42:4f:f0
```

```
  Private count          16

lcc2-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address    00:1f:12:c3:58:00
  Public count           2032
  Private base address   00:1f:12:c3:5f:f0
  Private count          16

lcc3-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address    00:21:59:ef:b8:00
  Public count           2032
  Private base address   00:21:59:ef:bf:f0
  Private count          16
```

show chassis mac-addresses (QFX Series and OCX Series)

```
user@switch> show chassis mac-addresses
MAC address information:
Public base address 02:00:08:00:00:00
Public count 512
Private base address 02:00:00:00:00:00
Private count 64
```

show chassis mac-addresses interconnect-device (QFabric Systems)

```
user@switch> show chassis mac-addresses interconnect-device interconnect1
MAC address information:
  Public base address    00:1f:12:30:9c:c0
  Public count           58
  Private base address   00:1f:12:30:9c:fa
  Private count          6
```

show chassis mac-addresses node-group (QFabric Systems)

```
user@switch> show chassis mac-addresses node-group NW-NG-0
MAC address information:
------------------------
RE:
  FC MAC base    00:11:00:00:00:00
  FC MAC count   2
  VLAN MAC       00:11:00:00:00:09
EC6007
  Base address   00:00:01:76:00:00
  Count          64
EC6008
  Base address   00:22:83:22:52:ae
  Count          260
```

show chassis mac-addresses (ACX2000 Universal Access Router)

```
user@switch> show chassis mac-addresses
MAC address information:
  Public base address    84:18:88:c0:2b:00
  Public count           112
  Private base address   84:18:88:c0:2b:70
  Private count          16
```


show chassis network services

Syntax show chassis network services

Release Information Command introduced in Junos OS Release 9.4.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.

Description Display the network services mode that the router is configured to run in—IP Network Services mode, Ethernet Network Services mode, Enhanced IP Network Services mode, or Enhanced Ethernet Network Services mode.

Options This command has no options.

Required Privilege Level view

List of Sample Output

Output Fields Table 96 on page 1445 lists the output fields for the **show chassis network services** command. Output fields are listed in the approximate order in which they appear.

Table 96: show chassis network services Output Fields

Field Name	Field Description
Network Services Mode	Network services mode configured for the MX Series router: • **IP**—IP Network Services mode. • **Ethernet**—Ethernet Network Services mode. • **enhanced-ip**—Enhanced IP Network Services mode • **enhanced-ethernet**—Enhanced Ethernet Network Services mode

Sample Output

show chassis network services

```
user@host> show chassis network services
Network Services Mode: IP
```

show chassis network services (MX104 Router)

```
user@host> show chassis network services
Network Services Mode: IP
```

show chassis network services (MX2010 Router)

```
user@host> show chassis network services
Network Services Mode: Enhanced-IP
```


show chassis network services (MX2020 Router)

```
user@host> show chassis network services
Network Services Mode: Enhanced-IP
```

show chassis oss-map

Syntax show chassis oss-map

Release Information Command introduced in Junos OS Release 12.3R3, 13.1R2, and 13.2R1 for T4000 routers.

Description (T4000 routers only) Display the operations support systems (OSS) mapping details.

Required Privilege Level view

Related Documentation

- Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 264
- Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 445
- **oss-map on page 539**
- Understanding Operations Support Systems Mapping on page 26

Output Fields Table 97 on page 1447 lists the output fields for the **show chassis oss-map** command. Output fields are listed in the approximate order in which they appear.

Table 97: show chassis oss-map Output Fields

Field Name	Field Description
Chassis type	Displays the original chassis type.
Oss-map	Displays the mapped chassis type.

Sample Output

```
user@T4000# show chassis oss-map
Chassis type              Oss-map
T4000                     T640
```


show chassis pic

List of Syntax

Syntax

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

Syntax (TX Matrix and TX Matrix Plus Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*
<lcc *number*>

Syntax (MX Series Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*
<all-members>
<local>
<member *member-id*>

Syntax (MX104, MX2010 and MX2020 3D Universal Edge Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

Syntax (PTX Series Packet Transport Router)

show chassis pic transport fpc-slot *slot-number* pic-slot *slot-number*

Syntax (QFX Series)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*
<interconnect-device *name* (fpc-slot *slot-number* | pic-slot *slot-number*)>
<node-device *name* pic-slot *slot-number*>

Syntax (OCX Series)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

Syntax (ACX Series Universal Access Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for QFX Series.
Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display status information about the PIC installed in the specified Flexible PIC Concentrator (FPC) and PIC slot.

Options **fpc-slot *slot-number***—Display information about the PIC in this particular FPC slot:

- On a TX Matrix router, if you specify the number of the T640 router by using the **lcc *number*** option (the recommended method), replace ***slot-number*** with a value from **0** through **7**. Otherwise, replace ***slot-number*** with a value from **0** through **31**.

  Likewise, on a TX Matrix Plus router, if you specify the number of the T1600 router by using the **lcc *number*** option (the recommended method), replace ***slot-number*** with a value from **0** through **7**. Otherwise, replace ***slot-number*** with a value from **0** through **31**. For example, the following commands have the same result:

  ```
  user@host> show chassis pic fpc-slot 1 lcc 1 pic-slot 1
  user@host> show chassis pic fpc-slot 9 pic-slot 1
  ```

- M120 routers only—Replace ***slot-number*** with a value from **0** through **5**.
- MX80 routers only—Replace ***slot-number*** with a value from **0** through **1**.
- MX104 routers only—Replace ***slot-number*** with a value from **0** through **2**.
- MX240 routers only—Replace ***slot-number*** with a value from **0** through **2**.
- MX480 routers only—Replace ***slot-number*** with a value from **0** through **5**.
- MX960 routers only—Replace ***slot-number*** with a value from **0** through **11**.
- MX2010 routers only—Replace ***slot-number*** with a value from **0** through **9**.
- MX2020 routers only—Replace ***slot-number*** with a value from **0** through **19**.
- Other routers—Replace ***slot-number*** with a value from **0** through **7**.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—Replace ***slot-number*** with 0.
  - EX4200 switches in a Virtual Chassis configuration—Replace ***slot-number*** with a value from 0 through 9 (switch's member ID).
  - EX8208 switches—Replace ***slot-number*** with a value from 0 through 7 (line card).
  - EX8216 switches—Replace ***slot-number*** with a value from 0 through 15 (line card).
- QFX Series:
  - QFX3500,QFX3600, QFX5100, and OCX Series standalone switches—Replace ***slot-number*** with 0. In the command output, FPC refers to a line card. The FPC number equals the slot number for the line card.
  - QFabric systems—Replace ***slot-number*** with any number between 0 and 15. In the command output, FPC refers to a line card. The FPC number equals the slot number for the line card.

all-members—(MX Series routers and EX Series switches only) (Optional) Display PIC information for all member routers in the Virtual Chassis configuration.

interconnect-device ***name***—(QFabric systems only) (Optional) Display PIC information for a specified Interconnect device.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display PIC information for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display PIC information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers and EX Series switches only) (Optional) Display PIC information for the local Virtual Chassis member.

member ***member-id***—(MX Series routers and EX Series switches only) (Optional) Display PIC information for the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device ***name***—(QFabric systems only) (Optional) Display PIC information for a specified Node device.

pic-slot ***slot-number***—Display information about the PIC in this particular PIC slot. For routers, replace ***slot-number*** with a value from **0** through **3**. For EX3200 and EX4200 switches, replace ***slot-number*** with 0 for built-in network interfaces and 1 for interfaces on uplink modules. For EX8208 and EX8216 switches, replace ***slot-number*** with 0. For the QFX3500, QFX3600, and OCX Series standalone switches , replace ***slot-number*** with 0.

transport—Display PIC information for optical transport network.

Required Privilege Level

view

Related Documentation

- request chassis pic on page 644
- show chassis hardware on page 1253
- *Configuring the PIC Type*

- *100-Gigabit Ethernet Type 4 PIC with CFP Overview*

List of Sample Output

show chassis pic FPC slot PIC slot (MX Routers with Media Services Blade [MSB]) on page 1463
show chassis pic transport fpc-slot pic-slot (PTX Series Packet Transport Routers) on page 1463

Output Fields Table 98 on page 1452 lists the output fields for the **show chassis pic** command. Output fields are listed in the approximate order in which they appear.

Table 98: show chassis pic Output Fields

Field Name	Field Description
Type	PIC type. NOTE: On the 1-port OC192/STM64 MICs with the SDH framing mode, the type is displayed as **MIC-3D-1STM64-XFP** and with the SONET framing mode, the type is displayed as **MIC-3D-1OC192-XFP**. By default, the 1-port OC192/STM64 MICs displays the type as **MIC-3D-1OC192-XFP**.
Account Layer2 Overhead	(MX Series routers) Indicates whether functionality to count the Layer 2 overhead bytes in the interface statistics at the PIC level is enabled or disabled.
ASIC type	Type of ASIC on the PIC.
State	Status of the PIC. State is displayed only when a PIC is in the slot. • **Online**— PIC is online and running. • **Offline**—PIC is powered down.
PIC version	PIC hardware version.
Uptime	How long the PIC has been online.
Package	(Multiservices PICs only) Services package supported: **Layer-2** or **Layer-3**.
Port Number	Port number for the PIC.
Cable Type	Type of cable connected to the port: **LH**, **LX**, or **SX.**
PIC Port Information (MX480 Router 100-Gigabit Ethernet CFP)	Port-level information for the PIC. • Port—Port number • Cable type—Type of optical transceiver installed. • Fiber type—Type of fiber. SM is single-mode. • Xcvr vendor—Transceiver vendor name. • Xcvr vendor part number—Transceiver vendor part number. • Wavelength—Wavelength of the transmitted signal. Uplinks and downlinks are always 1550 nm. There is a separate fiber for each direction

Table 98: show chassis pic Output Fields *(continued)*

Field Name	Field Description

PIC Port Information (MX960 Router Bidirectional Optics)	Port-level information for the PIC.
	• Port—Port number
	• Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. Uplink interfaces display -U. Down link interfaces display -D.
	• Fiber type—Type of fiber. SM is single-mode.
	• Xcvr vendor—Transceiver vendor name.
	• Xcvr vendor part number—Transceiver vendor part number.
	  ◦ BX10-10-km bidirectional optics.
	  ◦ BX40-40-km bidirectional optics.
	  ◦ SFP-LX-40-km SFP optics.
	• Wavelength—Wavelength of the transmitted signal. Uplinks are always 1310 nm. Downlinks are either 1490 nm or 1550 nm.

PIC Port Information (Next-Generation SONET/SDH SFP)	Port-level information for the next-generation SONET/SDH SFP PIC. • Port—Port number. • Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. • Fiber type—Type of fiber: **SM** (single-mode) or **MM** (multimode). • Xcvr vendor—Transceiver vendor name. • Xcvr vendor part number—Transceiver vendor part number. • Wavelength—Wavelength of the transmitted signal. Next-generation SONET/SDH SFPs use 1310 nm.
Pic port information (MX104 router)	Port-level information for the PIC. • Port—Port number • Cable type—Type of optical transceiver installed. • Fiber type—Type of fiber. SM is single-mode. • Xcvr vendor—Transceiver vendor name. • Xcvr vendor part number—Transceiver vendor part number. • Wavelength—Wavelength of the transmitted signal. • Xcvr Firmware—Firmware version of the transceiver.
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 pic-slot (M120 Router)

```
user@host> show chassis pic fpc-slot 3 pic-slot 0
PC slot 3, PIC slot 0 information:
  Type                             2x G/E IQ, 1000 BASE
  ASIC type                        IQ GE 2 VLAN-TAG FPGA
  State                            Online
  PIC version                 1.16
  Uptime                         3 hours, 3 minutes

PIC Port Information:
  Port        Cable            Xcvr              Xcvr Vendor
  Number      Type             Vendor Name       Part Number
  0           GIGE 1000SX      FINISAR CORP.     FTRJ8519P1BNL-J3
  1           GIGE 1000SX      FINISAR CORP.     FTRJ-8519-7D-JUN
```

show chassis pic fpc-slot pic-slot (MX104 Router)

```
user@host> show chassis pic fpc-slot 1 pic-slot 1
FPC slot 1, PIC slot 1 information:
  Type                             10x 1GE(LAN) -E  SFP
  State                            Online
  PIC version                  1.1
  Uptime                         1 hour, 30 minutes, 59 seconds

PIC port information:
                         Fiber                   Xcvr vendor       Wave-    Xcvr


  Port Cable type         type  Xcvr vendor        part number       length
Firmware
  3    GIGE 1000T         n/a   Methode Elec.      SP7041-M1-JN      n/a       0.0
```



```
  6     GIGE 1000LX10      SM    FINISAR CORP.      FTLF1318P2BTL-J1  1310 nm   0.0

  8     GIGE 1000T         n/a   Methode Elec.      SP7041-M1-JN      n/a       0.0

  9     GIGE 1000T         n/a   Methode Elec.      SP7041-M1-JN      n/a       0.0
```

show chassis pic fpc-slot pic-slot (MX960 Router Bidirectional Optics)

```
user@host> show chassis pic fpc-slot 4 pic-slot 1
FPC slot 4, PIC slot 1 information:
  Type                           10x 1GE(LAN)
  Account Layer2 Overhead        Enabled
  State                          Online
  PIC version                    0.0
  Uptime                         18 days, 5 hours, 41 minutes, 54 seconds

PIC port information:
                          Fiber                    Xcvr vendor
  Port  Cable type        type  Xcvr vendor        part number       Wavelength
  0     SFP-1000BASE-BX10-D SM  SumitomoElectric   SBP6H44-J3-BW-49  1490 nm
  1     SFP-1000BASE-BX10-D SM  SumitomoElectric   SBP6H44-J3-BW-49  1490 nm
  2     SFP-1000BASE-BX10-D SM  SumitomoElectric   SBP6H44-J3-BW-49  1490 nm
  3     SFP-1000BASE-BX10-D SM  OCP                TRXBG1LXDBVM2-JW  1490 nm
  4     SFP-1000BASE-BX10-D SM  OCP                TRXBG1LXDBVM2-JW  1490 nm
  5     SFP-1000BASE-BX10-U SM  SumitomoElectric   SBP6H44-J3-BW-31  1310 nm
  6     SFP-1000BASE-BX10-U SM  SumitomoElectric   SBP6H44-J3-BW-31  1310 nm
  7     SFP-1000BASE-BX10-U SM  OCP                TRXBG1LXDBBMH-J1  1310 nm
  8     SFP-1000BASE-BX10-U SM  OCP                TRXBG1LXDBBMH-J1  1310 nm
  9     SFP-1000BASE-BX10-U SM  SumitomoElectric   SBP6H44-J3-BW-31  1310 nm
```

show chassis pic fpc-slot pic-slot (MX480 Router with 100-Gigabit Ethernet MIC)

```
user@host> show chassis pic fpc-slot 1 pic-slot 2
FPC slot 1, PIC slot 2 information:
  Type                        1X100GE CFP
  State                       Online
  PIC version                 2.10
  Uptime                      4 minutes, 48 seconds

PIC port information:
        Fiber                      Xcvr vendor
  Port  Cable type        type  Xcvr vendor        part number       Wavelength
  0     100GBASE LR4      SM    FINISAR CORP.      FTLC1181RDNS-J3   1310 nm

        Xcvr vendor
        firmware version
        1.8
```

show chassis pic fpc-slot pic-slot (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```
user@host> show chassis pic fpc-slot 1 pic-slot 2
FPC slot 1, PIC slot 2 information:
  Type                             AS-MXC
  State                            Online
  PIC version                  1.0
  Uptime                         11 hours, 18 minutes, 3 seconds
```

show chassis pic fpc-slot pic-slot (MX960 Router with MPC5EQ)

```
user@host> show chassis pic fpc-slot 0 pic-slot 3
FPC slot 0, PIC slot 3 information:
  Type                             1X100GE CFP2 OTN
  State                            Online
  PIC version                  0.0
  Uptime                         1 hour, 22 minutes, 42 seconds

PIC port information:
                         Fiber                   Xcvr vendor       Wave-    Xcvr

  Port Cable type         type  Xcvr vendor        part number       length
Firmware
  0    100GBASE LR4      n/a   Oclaro Inc.        TRB5E20FNF-LF150  1309 nm  1.0
```

show chassis pic fpc-slot pic-slot (MX480 Routers with MPC4E)

```
user@host> show chassis pic fpc-slot 3 pic-slot 0
FPC slot 3, PIC slot 0 information:
  Type                             4x10GE SFPP
  State                            Online
  PIC version                  0.0
  Uptime                         41 seconds

PIC port information:
                         Fiber                   Xcvr vendor       Wave-    Xcvr

  Port Cable type         type  Xcvr vendor        part number       length
Firmware
  0    10GBASE SR        MM    OPNEXT, INC.       TRS2001EM-0014    850 nm   0.0

  1    10GBASE SR        MM    OPNEXT, INC.       TRS2001EM-0014    850 nm   0.0
```

show chassis pic fpc-slot pic-slot (MX480 routers with OTN Interfaces)

```
user@host> show chassis pci fpc-slot 4 pic-slot 0
FPC slot 4, PIC slot 0 information:
  Type                             12X10GE SFPP OTN
  State                            Online
  PIC version                  0.0
  Uptime                         5 hours, 28 minutes, 23 seconds

PIC port information:
                         Fiber                   Xcvr vendor       Wave-    Xcvr

  Port Cable type         type  Xcvr vendor        part number       length
Firmware
  0    10GBASE SR        MM    FINISAR CORP.      FTLX8571D3BNL-J1  850 nm   0.0

  1    10GBASE SR        MM    FINISAR CORP.      FTLX8571D3BCL-J1  850 nm   0.0

  2    10GBASE SR        MM    OPNEXT, INC.       TRS2001EM-0014    850 nm   0.0
```

show chassis pic fpc-slot pic-slot (MX2010 Routers with OTN Interfaces)

```
user@host> show chassis pic fpc-slot 9 pic-slot 0
```

```
FPC slot 9, PIC slot 0 information:
  Type                             2X100GE CFP2 OTN
  State                            Online
  PIC version                  1.9
  Uptime                         3 hours, 56 minutes, 16 seconds

PIC port information:
                         Fiber                  Xcvr vendor       Wave-    Xcvr

  Port Cable type        type  Xcvr vendor        part number       length
Firmware
  0    100GBASE LR4-D    SM    FUJITSU            FIM37300/222      1310 nm  1.3

  1    100GBASE SR10     MM    AVAGO              AFBR-8420Z        n/a      1.0
```

show chassis pic fpc-slot pic-slot (MX2010 Routers)

```
user@host> show chassis pic fpc-slot 9 pic-slot 3
FPC slot 9, PIC slot 3 information:
  Type                             1X100GE CFP
  Account Layer2 Overhead          Enabled
  State                            Online
  PIC version                      0.0
  Uptime                           14 hours, 51 seconds
```

show chassis pic fpc-slot pic-slot (MX2020 Routers)

```
user@host> show chassis pic fpc-slot 19 pic-slot 3
FPC slot 19, PIC slot 3 information:
  Type                             4x 10GE(LAN) SFP+
  Account Layer2 Overhead          Enabled
  State                            Online
  PIC version                  0.0
  Uptime                         1 day, 11 hours, 26 minutes, 36 seconds

PIC port information:
                         Fiber                  Xcvr vendor       Wave-    Xcvr

  Port Cable type        type  Xcvr vendor        part number       length
Firmware
  0    10GBASE SR        MM    SumitomoElectric   SPP5200SR-J6-M    850 nm   0.0

  1    10GBASE SR        MM    SumitomoElectric   SPP5200SR-J6-M    850 nm   0.0

  2    10GBASE SR        MM    SumitomoElectric   SPP5200SR-J6-M    850 nm   0.0

  3    10GBASE SR        MM    SumitomoElectric   SPP5200SR-J6-M    850 nm   0.0
```

show chassis pic fpc-slot pic-slot (MX2020 Routers with MPC5EQ and MPC6E)

```
user@host> show chassis pic fpc-slot 18 pic-slot 2
FPC slot 18, PIC slot 2 information:
  Type                             3X40GE QSFPP
  State                            Online
  PIC version                  0.0
  Uptime                         6 minutes, 31 seconds

PIC port information:
                         Fiber                  Xcvr vendor       Wave-    Xcvr

  Port Cable type        type  Xcvr vendor        part number       length
```



```
Firmware
  0     40GBASE SR4        MM     AVAGO              AFBR-79E4Z-D-JU2  850 nm    0.0

  1     40GBASE SR4        MM     AVAGO              AFBR-79E4Z-D-JU2  850 nm    0.0

  2     40GBASE SR4        MM     AVAGO              AFBR-79E4Z-D-JU2  850 nm    0.0
```

show chassis pic fpc-slot pic-slot (MX2020 Routers with MPC6E and OTN MIC)

```
user@host> show chassis pic fpc-slot 3 pic-slot 0
FPC slot 0, PIC slot 1 information:
  Type                             24X10GE SFPP OTN
  State                            Online
  PIC version                  1.1
  Uptime                         1 hour, 33 minutes, 59 seconds

PIC port information:
                         Fiber                   Xcvr vendor       Wave-    Xcvr

  Port Cable type         type  Xcvr vendor        part number       length
Firmware
  7     10GBASE SR        MM     SumitomoElectric   SPP5200SR-J6-M    850 nm    0.0

  9     10GBASE SR        MM     FINISAR CORP.      FTLX8571D3BNL-J1  850 nm    0.0

  12    10GBASE LR        SM     FINISAR CORP.      FTLX1472M3BNL-J3  1310 nm   0.0

  20    10GBASE ZR        SM     FINISAR CORP.      FTLX1871M3BNL-J3  1550 nm   0.0

  21    10GBASE ER        SM     FINISAR CORP.      FTLX1671D3BTL-J4  1550 nm   0.0

  22    10GBASE LR        SM     SOURCEPHOTONICS    SPP10SLREDFCJNP   1310 nm   0.0

  23    10GBASE LR        SM     FINISAR CORP.      FTLX1471D3BNL-J1  1310 nm   0.0
```

show chassis pic fpc-slot pic-slot (MX2020 Routers with MPC4E)

```
user@host> show chassis pic fpc-slot 14 pic-slot 0
FPC slot 14, PIC slot 2 information:
  Type                             4x10GE SFPP
  State                            Online
  PIC version                  0.0
  Uptime                         1 day, 14 hours, 49 minutes, 9 seconds

PIC port information:
                         Fiber                   Xcvr vendor       Wave-    Xcvr

  Port Cable type         type  Xcvr vendor        part number       length
Firmware
  0     10GBASE SR        MM     SumitomoElectric   SPP5100SR-J3      850 nm    0.0

  1     10GBASE SR        MM     SumitomoElectric   SPP5100SR-J3      850 nm    0.0

  3     10GBASE SR        MM     SumitomoElectric   SPP5100SR-J3      850 nm    0.0
```

show chassis pic fpc-slot pic-slot (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 pic-slot (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 pic-slot (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 pic-slot (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 pic-slot (4-port Channelized SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP)

```
user@host> show chassis pic fpc-slot 5 pic-slot 0
FPC slot 5, PIC slot 0 information:
  Type                           MIC-3D-4CHOC3-2CHOC12
  State                          Online
  PIC version                    1.9
  Uptime                         1 hour, 21 minutes

PIC port information:
                          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 pic-slot (1-port OC192/STM64 MIC with XFP)

```
user@host> show chassis pic fpc-slot 1 pic-slot 0
FPC slot 1, PIC slot 0 information:
  Type                               MIC-3D-1OC192-XFP
  State                              Online
  PIC version                        1.2
  Uptime                             1 day, 11 hours, 4 minutes, 6 seconds

PIC port information:
                          Fiber                   Xcvr vendor
  Port  Cable type        type  Xcvr vendor       part number       Wavelength
  0     OC192 short reach n/a   FINISAR CORP.     FTLX1412M3BCL-J3  1310 nm
```

show chassis pic fpc-slot 1 pic-slot 2 (8-port DS3/E3 MIC)

```
user@host> show chassis pic fpc-slot 1 pic-slot 2
FPC slot 1, PIC slot 2 information:
  Type                               MIC-3D-8DS3-E3
  State                              Online
  PIC version                        1.10
  Uptime                             4 days, 1 hour, 29 minutes, 19 seconds
  Channelization Mode                Disabled
```

show chassis pic fpc-slot pic-slot (OTN)

```
user@host> show chassis pic fpc-slot 5 pic-slot 0
PIC fpc slot 5 pic slot 0 information:
     Type                               1x10GE(LAN),OTN
     ASIC type                          H chip
     State                              Online
     PIC version                     1.0
     Uptime                          5 minutes, 50 seconds
```

show chassis pic fpc-slot pic-slot (QFX3500 Switch)

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
```

```
FPC slot 0, PIC slot 0 information:
Type 48x 10G-SFP+ Builtin
State Online
Uptime 3 days, 3 hours, 5 minutes, 20 seconds
```

show chassis pic fpc-slot pic-slot (QFX5100 Switches and OCX Series)

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
  Type                             Unknown Builtin
  State                            Online
  Uptime                         1 day, 17 hours, 5 minutes, 9 seconds
```

show chassis pic interconnect-device fpc-slot pic-slot (QFabric Systems)

```
user@switch> show chassis pic interconnect-device interconnect1 fpc-slot 9 pic-slot 0
FPC slot 9, PIC slot 0 information:
  Type                             16x 40G-GEBuiltin
  State                            Online
  Uptime                         2 hours, 47 minutes, 40 seconds
```

show chassis pic node-device fpc-slot pic-slot (QFabric System)

```
user@switch> show chassis pic node-device node1 pic-slot 0
FPC slot node1, PIC slot 0 information:
  Type                             48x 10G-SFP+Builtin
  State                            Online
  Uptime                         2 hours, 52 minutes, 37 seconds

PIC port information:
                          Fiber                    Xcvr vendor
  Port   Cable type       type  Xcvr vendor        part number      Wavelength
  0      10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  1      10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  2      10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  3      10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  4      10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  5      10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  6      10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  7      10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  8      10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  9      10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  10     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  11     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  12     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  13     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  14     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  15     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  16     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  17     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  18     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  19     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  20     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  21     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  22     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  23     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  24     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  25     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  26     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  27     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  28     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
  29     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3     850 nm
```

```
30    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
31    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
32    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
33    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
34    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
35    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
36    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
37    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
38    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
39    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
40    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
41    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
42    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
43    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
44    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
45    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
46    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
47    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3      850 nm
```

show chassis pic fpc-slot pic-slot (ACX2000 Universal Access Router)

```
user@host> show chassis pic fpc-slot 0 pic-slot 1
FPC slot 0, PIC slot 1 information:
  Type                             8x 1GE(LAN) RJ45 Builtin
  State                            Online
  Uptime                         6 days, 2 hours, 51 minutes, 11 seconds
```

show chassis pic fpc-slot pic-slot (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis pic fpc-slot 1 pic-slot 0
FPC slot 1, PIC slot 0 information:
  Type                             AS-MSC
  State                            Online
  PIC version                  1.6
  Uptime                         11 hours, 17 minutes, 56 seconds
```

show chassis pic FPC slot PIC slot (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis pic fpc-slot 1 pic-slot 2
Type                             AS-MXC
  State                            Online
  PIC version                  1.0
  Uptime                         11 hours, 18 minutes, 3 seconds
```

show chassis pic transport fpc-slot pic-slot (PTX Series Packet Transport Routers)

```
user@host> show chassis pic transport fpc-slot 2 pic-slot 0
Administrative State:      In Service
Operational    State:      Normal
```


show chassis power

List of Syntax

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Syntax (MX Series Router) on page 1464
Syntax (MX2020 3D Universal Edge Routers) on page 1464
Syntax (PTX Series) on page 1464
Syntax (MX2010 3D Universal Edge Routers) on page 1464

Syntax

show chassis power

Syntax (MX Series Router)

show chassis power
<all-members>
<local>
<member *member-id*>

Syntax (MX2020 3D Universal Edge Routers)

show chassis power

Syntax (PTX Series)

show chassis power
<detail>

Syntax (MX2010 3D Universal Edge Routers)

show chassis power

Release Information

Command introduced in Junos OS Release 10.0.
Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

Refereand PTX Series Packet Transport Routers only) Display power limits and usage information for the AC or DC power sources.

- On the MX Series 3D Universal Edge Routers, power is supplied by Power Entry Modules (PEMs).

> NOTE: The new high-capacity (4100 W) enhanced DC PEM on MX960 routers includes a new design that can condition the input voltage. This results in the output voltage differing from the input voltage. The earlier generation of DC PEMs coupled the input power directly to the output, thereby making it safe to assume that the output voltage was equal to the input voltage.

- On the MX2020 3D Universal Edge Routers, the power system consists of three components: the power supply modules (PSMs), the power distribution module (PDM), and the power midplane. The power feed is connected to the PDM. The PDM delivers power to the power midplane. The power midplane supplies power to the PSMs. The

MX2020 router chassis provides 3+3 (2500W/80A) or 4+4 (2100W/60A) PSM redundancy for the critical FRUs with two power zones.

- On the MX2010 3D Universal Edge Routers, the power system consists of three components: the power supply modules (PSMs), the power distribution module (PDM), and the power midplane. The power feed is connected to the PDM. The PDM delivers power to the power midplane. The power midplane supplies power to the PSMs. Unlike the MX2020 router chassis, the MX2010 router chassis does not provide redundancy for the critical FRUs because there is only one power zone.
- On the PTX Series Packet Transport Routers, power is supplied by power supply modules (PSMs). On PTX5000 routers, the power feeds connect to the power distribution units (PDUs).
- Starting with Junos OS Release 14.1, the **show chassis power <detail>** operational mode command output displays power usage information for the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-P1A) and other components in a PTX5000 Packet Transport Router. The output also displays power usage information for each PIC that is connected to the router.

Options

none—Display basic power usage information for the AC and DC power sources.

all-members—(MX Series routers only) (Optional) Display power usage information for all members of the Virtual Chassis configuration.

detail—(PTX Series only) (Optional) Include power usage for specific FRUs.

local—(MX Series routers only) (Optional) Display power usage information for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display power usage information for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

Required Privilege Level

view

Related Documentation

- show chassis power sequence on page 1483
- *Checklist for Monitoring Power Supplies*

List of Sample Output

Output Fields Table 99 on page 1466 lists the output fields for the **show chassis power** command. Output fields are listed in the approximate order in which they appear.

Table 99: show chassis power Output Fields

Field Name	Field Description	Level of Output

PEM ***number***	(MX Series routers only) AC or DC PEM number on the chassis. The following output fields are displayed for the PEM:
	• **State**—State of the PEM:
	  ◦ **Online**—PEM is present in the slot and online.
	  ◦ **Empty**—PEM is not present in the slot.
	  ◦ **Present**—PEM is present in the slot, but not online.
	• ***AC/DC*** **Input**—**OK** or **Check**—State of the AC or DC input power feed with the number of active and expected feeds (one or two).
	For a DC input power feed, this output field also displays the reference voltage input with maximum input voltage displayed in mV (in parentheses) for the AC or DC PEM.
	• **Capacity**—Actual power input capacity with maximum capacity displayed (in parentheses) in watts.
	NOTE: The maximum capacity for AC and DC PEMs is:
	  ◦ MX960 AC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected.
	  ◦ MX960 DC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected.
	  ◦ MX480 AC PEM—2520 W if it is high-line. 1450 W if it is low-line.
	  ◦ MX480 DC PEM—2400 W if the DIP switch is off. 2600 W if the DIP switch is on.
	  ◦ MX240 AC PEM—2520 W if it is high-line. 1450 W if it is low-line.
	  ◦ MX240 DC PEM—2400 W if the DIP switch is off. 2600 W if the DIP switch is on.
	• **DC Output**—DC power output in Watts for the specified zone, at the specified amps and voltage (*A* @ *V*), and load and percentage utilization of the maximum capacity) for the zone.
		All levels

Table 99: show chassis power Output Fields *(continued)*

Field Name	Field Description	Level of Output

System	(MX Series, MX2020, and MX2010 routers only) Overall power statistics for the system zone.
	
	The following output fields are displayed for MX Series routers:
	
	• Zone *number*:
	  ◦ **Capacity**—Maximum power capacity applicable for the zone, in watts.
	  ◦ **Allocated power**—Actual capacity allocated for the zone, in watts, with remaining power displayed in parentheses.
	  ◦ **Actual usage**—Actual power usage for the zone, in watts.
	• **Total system capacity**—Cumulative power capacity of all the zones, in watts.
	• **Total remaining capacity**—Difference between the **Total system capacity** and cumulative **Allocated power** of all the zones, in watts.
	
	The following output fields are displayed for MX2010 and MX2020 routers:
	
	• **Capacity**—Maximum power capacity applicable for the zone, in watts.
	• **Allocated power**—Actual capacity allocated for the zone, in watts, with remaining power displayed in parentheses.
	• **Actual usage**—Actual power usage for the zone, in watts.
	
	NOTE: For MX2020 routers, there are two power subsystems (Lower Zone and Upper Zone) and the listed output fields are displayed for each zone.
		All levels

Total Power	(PTX Series only) Total power used by the switch (displayed in watts).	All levels
PDU *number*	(PTX5000 only) ID number of the power distribution unit (PDU) on the chassis.	All levels

Table 99: show chassis power Output Fields *(continued)*

<table>
<tr><th>Field Name</th><th>Field Description</th><th>Level of Output</th></tr>
<tr><td>PSM number</td><td>(PTX Series, MX2020 routers, and MX2010 routers only) ID number of the power supply module..

(PTX Series) The following output fields are displayed for each PSM:
Input (V)—Voltage supplied to the PSM.
Used (W)—Actual power usage for the PSM (measured in watts).
NOTE: Starting with Junos OS Release 14.1, no output is displayed for Input (v) and Used (W) fields for missing PSMs; unlike in earlier releases where 0 was displayed for missing PSMs.

(MX2010 and MX2020 routers) The following output fields are displayed for each PSM:
State—State of the PSM:
Online—PSM is present in the slot and online.
Empty—PSM is not present in the slot.
Present—PSM is present in the slot but not online.
DC Input—State of the DC input power feed with the number of active or expected feeds (in parantheses).
Capacity—Actual power input capacity and maximum capacity (in parantheses) displayed in watts.
NOTE: The maximum capacity for AC and DC PSMs is:
MX2010/MX2020 AC PSM—2500 W.
MX2010/MX2020 DC PSM—2100 W if the DIP switch is at 60A settings. 2500 W if the DIP switch is at 80A settings.
DC Output—DC power output in watts for the specified zone at the specified amperes and voltage (A at V), and load and percentage utilization of the maximum capacity for the zone.</td><td>All levels</td></tr>
<tr><td>Item</td><td>(PTX Series only) (detail keyword only)

Actual power usage (measured in watts) for the following FRUs:
Fan Tray n—Power usage for the specified fan tray.
REn/CBn—Power usage for the specified Routing Engines and Control Boards
SIB/CCG/FPD—Power usage for the Switch Interface Board, Centralized Clock Generator (PTX5000 only), and Front Panel Display (craft interface).
FPC n—Power usage for the FPC in the slot specified.</td><td>detail</td></tr>
</table>

Sample Output

show chassis power (MX960 Router with DC PEM)

```
user@host> show chassis power
PEM 0:
  State:      Online
  DC input:   OK (2 feed expected, 2 feed connected)
  DC input:   48.0 V input (57000 mV)
```



```
  Capacity:  4100 W (maximum 4100 W)
  DC output: 513 W (zone 0, 9 A at 57 V, 12% of capacity)

PEM 1:
  State:     Online
  DC input:  OK (2 feed expected, 2 feed connected)
  DC input:  48.0 V input (57000 mV)
  Capacity:  4100 W (maximum 4100 W)
  DC output: 228 W (zone 1, 4 A at 57 V, 5% of capacity)

PEM 2:
  State:     Online
  DC input:  OK (2 feed expected, 2 feed connected)
  DC input:  48.0 V input (57000 mV)
  Capacity:  4100 W (maximum 4100 W)
  DC output: 513 W (zone 0, 9 A at 57 V, 12% of capacity)

PEM 3:
  State:     Online
  DC input:  OK (2 feed expected, 2 feed connected)
  DC input:  48.0 V input (57000 mV)
  Capacity:  4100 W (maximum 4100 W)
  DC output: 342 W (zone 1, 6 A at 57 V, 8% of capacity)

System:
  Zone 0:
      Capacity:          4100 W (maximum 4100 W)
      Allocated power:   1680 W (2420 W remaining)
      Actual usage:      1026 W
  Zone 1:
      Capacity:          4100 W (maximum 4100 W)
      Allocated power:   1263 W (2837 W remaining)
      Actual usage:      570 W
  Total system capacity: 8200 W (maximum 8200 W)
  Total remaining power: 5257 W
```

show chassis power (MX960 Router with AC PEM)

```
user@host> show chassis power
PEM 0:
  State:     Online
  AC input:  OK (2 feed expected, 2 feed connected)
  Capacity:  4100 W (maximum 4100 W)
  DC output: 0 W (zone 0, 0 A at 56 V, 0% of capacity)

PEM 1:
  State:     Present
  AC input:  Check (2 feed expected, 1 feed connected)
  Capacity:  1700 W (maximum 4100 W)

PEM 2:
  State:     Empty
  Input:     Absent

PEM 3:
  State:     Online
  AC input:  OK (1 feed expected, 1 feed connected)
  Capacity:  1700 W (maximum 1700 W)

System:
  Zone 0:
```



```
        Capacity:           4100 W (maximum 4100 W)
        Allocated power:    540 W (3560 W remaining)
        Actual usage:       0 W
    Zone 1:
        Capacity:           0 W (maximum 0 W)
        Allocated power:    0 W (0 W remaining)
        Actual usage:       0 W
    Total system capacity: 4100 W (maximum 4100 W)
    Total remaining power: 3560 W
```

show chassis power (MX960 Router with MPC5EQ)

```
user@host> show chassis power
PEM 0:
  State:     Online
  AC input:  OK (2 feed expected, 2 feed connected)
  Capacity:  4100 W (maximum 4100 W)
  DC output: 1197 W (zone 0, 21 A at 57 V, 29% of capacity)

PEM 1:
  State:     Online
  AC input:  OK (2 feed expected, 2 feed connected)
  Capacity:  4100 W (maximum 4100 W)
  DC output: 2451 W (zone 1, 43 A at 57 V, 59% of capacity)

PEM 2:
  State:     Online
  AC input:  OK (2 feed expected, 2 feed connected)
  Capacity:  4100 W (maximum 4100 W)
  DC output: 1083 W (zone 0, 19 A at 57 V, 26% of capacity)

PEM 3:
  State:     Empty
  Input:     Absent

System:
  Zone 0:
      Capacity:           4100 W (maximum 4100 W)
      Allocated power:    3508 W (592 W remaining)
      Actual usage:       2280 W
  Zone 1:
      Capacity:           4100 W (maximum 4100 W)
      Allocated power:    3341 W (759 W remaining)
      Actual usage:       2451 W
  Total system capacity: 8200 W (maximum 8200 W)
  Total remaining power: 1351 W
```

show chassis power detail (MX960 Router with MPC5EQ)

```
user@host> show chassis power detail
PEM 0:
  State:     Online
  AC input:  OK (2 feed expected, 2 feed connected)
  Capacity:  4100 W (maximum 4100 W)
  DC output: 1140 W (zone 0, 20 A at 57 V, 27% of capacity)

PEM 1:
  State:     Online
  AC input:  OK (2 feed expected, 2 feed connected)
  Capacity:  4100 W (maximum 4100 W)
  DC output: 2451 W (zone 1, 43 A at 57 V, 59% of capacity)
```



```
PEM 2:
  State:     Online
  AC input:  OK (2 feed expected, 2 feed connected)
  Capacity:  4100 W (maximum 4100 W)
  DC output: 1026 W (zone 0, 18 A at 57 V, 25% of capacity)

PEM 3:
  State:     Empty
  Input:     Absent

System:
  Zone 0:
      Capacity:          4100 W (maximum 4100 W)
      Allocated power:   3508 W (592 W remaining)
      Actual usage:      2166 W
  Zone 1:
      Capacity:          4100 W (maximum 4100 W)
      Allocated power:   3341 W (759 W remaining)
      Actual usage:      2451 W
  Total system capacity: 8200 W (maximum 8200 W)
  Total remaining power: 1351 W

Item                 Used(W)
  FPC 0                   0
  FPC 4                   0
  FPC 5                   0
  FPC 8                   0
  FPC 10                  0
```

show chassis power (MX480 Router with AC PEM)

```
user@host> show chassis power
PEM 0:
  State:     Online
  AC input:  OK (1 feed expected, 1 feed connected)
  Capacity:  2520 W (maximum 2520 W)
  DC output: 472 W (zone 0, 8 A at 59 V, 18% of capacity)

PEM 1:
  State:     Online
  AC input:  OK (1 feed expected, 1 feed connected)
  Capacity:  2520 W (maximum 2520 W)
  DC output: 472 W (zone 0, 8 A at 59 V, 18% of capacity)

PEM 2:
  State:     Online
  AC input:  OK (1 feed expected, 1 feed connected)
  Capacity:  2520 W (maximum 2520 W)
  DC output: 118 W (zone 0, 2 A at 59 V, 4% of capacity)

PEM 3:
  State:     Empty
  Input:     Absent

System:
  Maximum capacity:   5040 W
  Allocated capacity: 1675 W (33% of maximum)
  Remaining capacity: 3365 W
  Actual usage:       1062 W
```


show chassis power (MX240 Router with DC PEM)

```
user@host> show chassis power
PEM 0:
  State:     Online
  DC input:  OK (1 feed expected, 1 feed connected)
  DC input:  48.0 V input (53500 mV)
  Capacity:  2400 W (maximum 2400 W)
  DC output: 318 W (zone 0, 6 A at 53 V, 13% of capacity)

PEM 1:
  State:     Online
  DC input:  OK (1 feed expected, 1 feed connected)
  DC input:  48.0 V input (54000 mV)
  Capacity:  2400 W (maximum 2400 W)
  DC output: 0 W (zone 0, 0 A at 54 V, 0% of capacity)

PEM 2:
  State:     Online
  DC input:  OK (1 feed expected, 1 feed connected)
  DC input:  48.0 V input (52500 mV)
  Capacity:  2400 W (maximum 2400 W)
  DC output: 312 W (zone 0, 6 A at 52 V, 13% of capacity)

PEM 3:
  State:     Online
  DC input:  OK (1 feed expected, 1 feed connected)
  DC input:  48.0 V input (55000 mV)
  Capacity:  2400 W (maximum 2400 W)
  DC output: 0 W (zone 0, 0 A at 55 V, 0% of capacity)

System:
  Maximum capacity:   2400 W
  Allocated capacity: 1270 W (52% of maximum)
  Remaining capacity: 1130 W
  Actual usage:       630 W
```

show chassis power (MX2010 Router)

```
user@host > show chassis power
PSM 0:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 1022.06 W (19.75 A at 51.75 V, 40.88% of capacity)

PSM 1:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 996.19 W (19.25 A at 51.75 V, 39.85% of capacity)

PSM 2:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 1022.06 W (19.75 A at 51.75 V, 40.88% of capacity)

PSM 3:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
```

```
  Capacity:  2500 W (maximum 2500 W)
  DC output: 1004.25 W (19.50 A at 51.50 V, 40.17% of capacity)

PSM 4:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 996.19 W (19.25 A at 51.75 V, 39.85% of capacity)

PSM 5:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 1017.12 W (19.75 A at 51.50 V, 40.69% of capacity)

PSM 6:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 1009.12 W (19.50 A at 51.75 V, 40.37% of capacity)

PSM 7:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 996.19 W (19.25 A at 51.75 V, 39.85% of capacity)

PSM 8:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 1004.25 W (19.50 A at 51.50 V, 40.17% of capacity)

System:
  Capacity:              22500 W (maximum 22500 W)
  Allocated power:       12888 W (9612 W remaining)
  Actual usage:          9067.44 W
```

show chassis power (MX2020 Router)

```
user@host > show chassis power
PSM 0:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 858.44 W (Lower Zone, 16.75 A at 51.25 V, 34.34% of capacity)

PSM 1:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 854.25 W (Lower Zone, 16.75 A at 51.00 V, 34.17% of capacity)

PSM 2:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 858.44 W (Lower Zone, 16.75 A at 51.25 V, 34.34% of capacity)

PSM 3:
  State:     Online
```

```
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 867.00 W (Lower Zone, 17.00 A at 51.00 V, 34.68% of capacity)

PSM 4:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 871.25 W (Lower Zone, 17.00 A at 51.25 V, 34.85% of capacity)

PSM 5:
  State:     Empty
  Input:     Absent

PSM 6:
  State:     Empty
  Input:     Absent

PSM 7:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 867.00 W (Lower Zone, 17.00 A at 51.00 V, 34.68% of capacity)

PSM 8:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2500 W (maximum 2500 W)
  DC output: 879.75 W (Lower Zone, 17.25 A at 51.00 V, 35.19% of capacity)

PSM 9:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

PSM 10:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 615.00 W (Upper Zone, 12.00 A at 51.25 V, 29.29% of capacity)

PSM 11:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

PSM 12:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

PSM 13:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 612.00 W (Upper Zone, 12.00 A at 51.00 V, 29.14% of capacity)

PSM 14:
```



```
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 627.81 W (Upper Zone, 12.25 A at 51.25 V, 29.90% of capacity)

PSM 15:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 627.81 W (Upper Zone, 12.25 A at 51.25 V, 29.90% of capacity)

PSM 16:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 615.00 W (Upper Zone, 12.00 A at 51.25 V, 29.29% of capacity)

PSM 17:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

System:
  Upper Zone:
      Capacity:          18900 W (maximum 22500 W)
      Allocated power:   12900 W (6000 W remaining)
      Actual usage:      5596.62 W
  Lower Zone:
      Capacity:          17500 W (maximum 17500 W)
      Allocated power:   12900 W (4600 W remaining)
      Actual usage:      6056.12 W
  Total system capacity: 36400 W (maximum 40000 W)
  Total remaining power: 10600 W
```

show chassis power (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis power
PSM 0:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 1:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 538.12 W (Lower Zone, 10.50 A at 51.25 V, 25.62% of capacity)

PSM 2:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 538.12 W (Lower Zone, 10.50 A at 51.25 V, 25.62% of capacity)

PSM 3:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)
```



```
PSM 4:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 5:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 6:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 7:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 8:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 9:
  State:     Empty
  Input:     Absent

PSM 10:
  State:     Empty
  Input:     Absent

PSM 11:
  State:     Empty
  Input:     Absent

PSM 12:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 515.00 W (Upper Zone, 10.00 A at 51.50 V, 24.52% of capacity)

PSM 13:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 517.50 W (Upper Zone, 10.00 A at 51.75 V, 24.64% of capacity)

PSM 14:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 515.00 W (Upper Zone, 10.00 A at 51.50 V, 24.52% of capacity)
```



```
PSM 15:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 527.88 W (Upper Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 16:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 530.44 W (Upper Zone, 10.25 A at 51.75 V, 25.26% of capacity)

PSM 17:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 515.00 W (Upper Zone, 10.00 A at 51.50 V, 24.52% of capacity)

System:
  Upper Zone:
      Capacity:          12600 W (maximum 15000 W)
      Allocated power:   9436 W (3164 W remaining)
      Actual usage:      3120.81 W
  Lower Zone:
      Capacity:          18900 W (maximum 22500 W)
      Allocated power:   10842 W (8058 W remaining)
 Actual usage:      4810.00 W
  Total system capacity: 31500 W (maximum 37500 W)
  Total remaining power: 11222 W
```

show chassis power detail (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis power detail
PSM 0:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 1:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 538.12 W (Lower Zone, 10.50 A at 51.25 V, 25.62% of capacity)

PSM 2:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 538.12 W (Lower Zone, 10.50 A at 51.25 V, 25.62% of capacity)

PSM 3:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 4:
  State:     Online
```

```
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 515.00 W (Lower Zone, 10.00 A at 51.50 V, 24.52% of capacity)

PSM 5:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 6:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 7:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 8:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 530.44 W (Lower Zone, 10.25 A at 51.75 V, 25.26% of capacity)

PSM 9:
  State:     Empty
  Input:     Absent

PSM 10:
  State:     Empty
  Input:     Absent

PSM 11:
  State:     Empty
  Input:     Absent

PSM 12:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 517.50 W (Upper Zone, 10.00 A at 51.75 V, 24.64% of capacity)

PSM 13:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 517.50 W (Upper Zone, 10.00 A at 51.75 V, 24.64% of capacity)

PSM 14:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 515.00 W (Upper Zone, 10.00 A at 51.50 V, 24.52% of capacity)

PSM 15:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
```

```
  Capacity:  2100 W (maximum 2500 W)
  DC output: 527.88 W (Upper Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 16:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 517.50 W (Upper Zone, 10.00 A at 51.75 V, 24.64% of capacity)

PSM 17:
  State:     Online
  DC input:  OK (INP0 feed expected, INP0 feed connected)
  Capacity:  2100 W (maximum 2500 W)
  DC output: 515.00 W (Upper Zone, 10.00 A at 51.50 V, 24.52% of capacity)

System:
  Upper Zone:
      Capacity:          12600 W (maximum 15000 W)
      Allocated power:   9436 W (3164 W remaining)
      Actual usage:      3110.38 W
  Lower Zone:
      Capacity:          18900 W (maximum 22500 W)
      Allocated power:   10842 W (8058 W remaining)
Actual usage:      4799.69 W
  Total system capacity: 31500 W (maximum 37500 W)
  Total remaining power: 11222 W

Item                 Used(W)
  FPC 0                  0
  FPC 4                  0
  FPC 9                719
  FPC 10               681
  FPC 17               656
  FPC 18                 0
  FPC 19                 0
```

show chassis power (PTX5000 Packet Transport Router)

```
user@host> show chassis power
Chassis Power        Input(V)      Used(W)

Total Power                          4006

  PDU 0                              1986
    PSM 0
      Input 1            54           149
    PSM 1
      Input 1            54           377
    PSM 2
      Input 1            54           745
    PSM 3
      Input 1            54           715

  PDU 1                              2020
    PSM 0
      Input 1            54           246
    PSM 1
      Input 1            54           332
    PSM 2
      Input 1            54           721
```

```
    PSM 3
      Input 1          54          721
```

show chassis power (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis power

Chassis Power        Input(V)      Used(W)

Total Power                         4402

  PDU 0                             2104
    PSM 0
      Input 1          53            229
      Input 2          53            375
    PSM 1
    PSM 2
      Input 1          53            248
      Input 2          53            323
    PSM 3
    PSM 4
      Input 1          53            206
      Input 2          53            255
    PSM 5
    PSM 6
      Input 1          53            206
      Input 2          53            262
    PSM 7

  PDU 1                             2298
    PSM 0
    PSM 1
      Input 1          53            289
      Input 2          53            267
    PSM 2
    PSM 3
      Input 1          53            309
      Input 2          53            315
    PSM 4
    PSM 5
      Input 1          53            335
      Input 2          53            220
    PSM 6
    PSM 7
      Input 1          53            308
      Input 2          53            255
```

show chassis power detail (PTX5000 Packet Transport Router)

```
user@host> show chassis power detail
Chassis Power        Input(V)      Used(W)

Total Power                         3997

  PDU 0                             1975
    PSM 0
      Input 1          54            136
    PSM 1
      Input 1          54            377
    PSM 2
      Input 1          54            741
```



```
    PSM 3
      Input 1           54          721

  PDU 1                            2022
    PSM 0
      Input 1           54          235
    PSM 1
      Input 1           54          332
    PSM 2
      Input 1           54          726
    PSM 3
      Input 1           54          729

Item                 Used(W)
  Fan Tray 0            49
  Fan Tray 1           127
  Fan Tray 2           117
  RE0/CB0              109
  RE1/CB1              100
  SIB/CCG/FPD          375
  FPC 0                381
  FPC 1                  0
  FPC 2                447
  FPC 3                560
  FPC 4                  0
  FPC 5                448
  FPC 6                379
  FPC 7                388
```

show chassis power detail (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis power detail
Chassis Power        Input(V)      Used(W)

Total Power                         4394

  PDU 0                             2095
    PSM 0
      Input 1           53          222
      Input 2           53          368
    PSM 1
    PSM 2
      Input 1           53          248
      Input 2           53          329
    PSM 3
    PSM 4
      Input 1           53          212
      Input 2           53          248
    PSM 5
    PSM 6
      Input 1           53          206
      Input 2           53          262
    PSM 7

  PDU 1                             2299
    PSM 0
    PSM 1
      Input 1           53          296
      Input 2           53          260
    PSM 2
    PSM 3
```

```
      Input 1            53          309
      Input 2            53          315
    PSM 4
    PSM 5
      Input 1            53          342
      Input 2            53          214
    PSM 6
    PSM 7
      Input 1            53          308
      Input 2            53          255

Item                 Used(W)
  Fan Trays            252
  RE0/CB0               93
  RE1/CB1               92
  SIB                  360
  FPC 0                369
      PIC 0             16
      PIC 1              0
  FPC 1                  0
  FPC 2                437
      PIC 0             44
      PIC 1             38
  FPC 3                740
      PIC 0             41
      PIC 1             46
  FPC 4                732
      PIC 0             74
      PIC 1             37
  FPC 5                  0
  FPC 6                  0
  FPC 7                  0
```

show chassis power sequence

Syntax

show chassis power sequence

Release Information

Command introduced in Junos OS Release 10.0.
Command introduces in Junos OS Release 12.1 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

(MX Series 3D Universal Edge Routers only) Show power-on sequence for the chassis Dense Port Concentrators (DPCs).

(PTX Series Packet Transport Routers, MX2010 and MX2020 routers only) Show power-on sequence for FPCs installed in the chassis.

Options

This command has no options.

Required Privilege Level

view

Related Documentation

- show chassis power on page 1464

List of Sample Output

show chassis power sequence (MX Series) on page 1483
show chassis power sequence (MX2010 Routers) on page 1483
show chassis power sequence (MX2020 Routers) on page 1484
show chassis power sequence (PTX5000 Packet Transport Router) on page 1484

Output Fields

Table 100 on page 1483 lists the output fields for the **show chassis power sequence** command. Output fields are listed in the approximate order in which they appear.

Table 100: show chassis power sequence Output Fields

Field Name	Field Description
Chassis FRU Power Sequence	(MX Series) Power-on sequence for the DPCs in the chassis. The numbers indicate the slot number of the DPCs. (PTX Series, MX2010 and MX2020 routers only) Power-on sequence for the FPCs in the chassis. The numbers indicate the slot number of the FPC.

Sample Output

show chassis power sequence (MX Series)

```
user@host> show chassis power sequence
Chassis FRU Power Sequence: 3 4 5 6 7 8 9 10 11 0 1 2
```

show chassis power sequence (MX2010 Routers)

```
user@host > show chassis power sequence
Chassis FRU Power On Sequence: 0 1 2 3 4 5 6 7 8 9
```


show chassis power sequence (MX2020 Routers)

```
user@host > show chassis power sequence
Chassis FRU Power On Sequence: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
```

show chassis power sequence (PTX5000 Packet Transport Router)

```
user@host> show chassis power sequence
Chassis FRU Power On Sequence: 0 1 2 3 4 5 6 7
```


show chassis psd

Syntax **show chassis psd**

Release Information Command introduced in Junos OS Release 9.1.

Description (Root System Domain [RSD] only) Display information about Protected System Domains (PSDs). A PSD is initially created by the RSD configuration. An RSD and PSDs are supported on a T320 or T640 router, or a T1600 routing node, or a TX Matrix Plus Platform that is interconnected with the JCS1200 platform.

NOTE: RSD configuration is not supported on a routing matrix based on TX Matrix Plus router with 3D SIBs.

Options This command has no options.

Additional Information For more information about PSDs, RSDs, and the JCS1200 platform, see the *Junos OS Protected System Domain Feature Guide for Routing Devices*.

Required Privilege Level view

List of Sample Output show chassis psd on page 1485

Output Fields Table 101 on page 1485 lists the output fields for the **show chassis psd** command. Output fields are listed in the approximate order in which they appear.

Table 101: show chassis psd Output Fields

Field Name	Field Description
Slot Description	PSD identification.
State	PSD status: • **Online**—PSD is online and running. • **Offline**—PSD is powered down.
Uptime	Length of time that the PSD has been up and running.

Sample Output

show chassis psd

```
{master}

user@host> show chassis psd
Slot Description          State               Uptime
 1                        Online              12 hours, 19 minutes, 51 seconds
```

```
2                       Online              2 hours, 18 minutes, 17 seconds
3                       Online              12 hours, 19 minutes, 51 seconds
```

show chassis redundancy feb

Syntax

show chassis redundancy feb
<errors>
<redundancy-group *group-name*>

Release Information

Command introduced in Junos OS Release 8.2.

Description

(M120 routers only) Display information about the status of configured Forwarding Engine Board (FEB) redundancy groups.

Options

none—Display information about the status of all configured FEB redundancy groups.

redundancy-group ***group-name***—(Optional) Display information about the specified configured redundancy group.

errors—(Optional) Display information about any errors encountered on the components in configured redundancy groups or on links between a FEB and a Flexible PIC Concentrator (FPC).

Required Privilege Level

view

Related Documentation

- request chassis redundancy feb slot on page 648
- *Configuring FEB Redundancy on the M120 Router*
- *Understanding Switching Control Board Redundancy*

List of Sample Output

show chassis redundancy feb on page 1488
show chassis redundancy feb redundancy-group grp1 on page 1488
show chassis redundancy feb redundancy-group grp0 errors on page 1488

Output Fields

Table 102 on page 1487 lists the output fields for the **show chassis redundancy feb** command. Output fields are listed in the approximate order in which they appear.

Table 102: show chassis redundancy feb Output Fields

Field name	Field Description
Group	Name of configured redundancy group.
FEB	Slot number of each FEB included in redundancy groups.
State	State of each FEB: • **Online**—FEB is online and running. • **Offline**—FEB is powered down.
Priority	(Standard and **redundancy-group** option) Status of FEB in the redundancy group: **Backup**, **Primary**, **Other**, or null.

Table 102: show chassis redundancy feb Output Fields *(continued)*

Field name	Field Description
Connected FPCs	(Standard and **redundancy-group** option) Slot number of each FPC connected to the FEB. The status **Check** is displayed when an error might have occurred.
Redundancy State	(Standard and **redundancy-group** option) Status of the FEB: • **Active**—FEB is currently active. • **Ready**—Backup FEB is ready for a switchover • **Not Ready**—Backup FEB is not ready for a switchover.
Auto-failover	(Standard and **redundancy-group** option) Automatic failover status of redundancy group: **Enabled** or **Disabled**.
Switch-reason	(Standard and **redundancy-group** option) Reason a switchover occurred to the backup FEB in the redundancy group.
Hard error: Yes	(**errors** option only) Displayed when a hard error occurs on a FEB.
FPC	(**errors** option only) Slot number and status of FPC: **link ok** or **link error**.
Fabric plane	(**errors** option only) Slot number and status of fabric plane.

Sample Output

show chassis redundancy feb

```
user@host> show chassis redundancy feb
Group:        cfpc
  FEB  State            Priority  Connected FPCs  Redundancy state
  0    Offline          Backup                    Not ready
  1    Online                     5               Active
  Auto-failover:  Enabled
 Group:        grp0
  FEB  State            Priority  Connected FPCs  Redundancy state
  3    Offline          Backup                    Not ready
  5    Online           Primary   0               Active
  Auto-failover:  Enabled
```

show chassis redundancy feb redundancy-group grp1

```
user@host> show chassis redundancy feb redundancy-group grp1
Group:        grp1
  FEB  State            Priority  Connected FPCs  Redundancy state
  0    Online           Other     0               Active
  1    Online           Other     1               Active
  4    Online           Primary   4               Active
  5    Online           Backup                    Ready
  Autofailover:  Enabled
  Switch-reason: Switchover from CLI
```

show chassis redundancy feb redundancy-group grp0 errors

```
user@host> show chassis redundancy feb redundancy-group grp0 errors
```

```
Group: grp0
    FEB: 0    State: Online
        FPC 0 link OK
        Fabric plane 0 OK
        Fabric plane 1 OK
        Fabric plane 2 OK
        Fabric plane 3 OK
    FEB: 1    State: Online
        FPC 0 link OK
        Fabric plane 0 OK
        Fabric plane 1 OK
        Fabric plane 2 OK
        Fabric plane 3 OK
    FEB: 2    State: Online
        FPC 2 link OK
        Fabric plane 0 OK
        Fabric plane 1 OK
        Fabric plane 2 OK
        Fabric plane 3 OK
    FEB: 3    State: Online
        FPC 3 link OK
        Fabric plane 0 OK
        Fabric plane 1 OK
        Fabric plane 2 OK
        Fabric plane 3 OK
    FEB: 4    State: Online
        FPC 4 link OK
        Fabric plane 0 OK
        Fabric plane 1 OK
        Fabric plane 2 OK
        Fabric plane 3 OK
    FEB: 5    State: Online
        FPC 5 link OK
        Fabric plane 0 OK
        Fabric plane 1 OK
        Fabric plane 2 OK
        Fabric plane 3 OK
```


show chassis routing-engine

List of Syntax

Syntax

show chassis routing-engine
<bios | *slot*>

Syntax (EX Series Switches)

show chassis routing-engine
<*slot*>

Syntax (T Series routers)

show chassis routing-engine
<bios | *slot*>

Syntax (TX Matrix Routers)

show chassis routing-engine
<bios | *slot*>
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis routing-engine
<bios | *slot*>
<lcc *number* | sfc *number*>

Syntax (QFX Series)

show chassis routing-engine
<interconnect-device *name*>
<node-device *name*>

Syntax (OCX Series)

show chassis routing-engine

Syntax (MX Series Routers)

show chassis routing-engine
<bios | *slot*>
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis routing-engine
<bios | *slot*>

Syntax (MX2020 3D Universal Edge Routers)

show chassis routing-engine
<bios | *slot*>

Syntax (MX104 3D Universal Edge Routers)

show chassis routing-engine

Syntax (ACX Series Universal Access Routers)

show chassis routing-engine

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option introduced for the TX Matrix Plus router in Junos OS Release in 9.6.
Command introduced in Junos OS Release 11.1 for QFX Series.
Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Univesral Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX 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 routers.

all-members—(MX Series routers only) (Optional) Display Routing Engine information for all members of the Virtual Chassis configuration.

bios—(Optional) Display the (BIOS) firmware version.

interconnect-device ***number***—(QFabric systems only) (Optional) Display Routing Engine information for a specified Interconnect device.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display Routing Engine information for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display Routing Engine information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display Routing Engine information for the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Display Routing Engine information for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

node-device ***number***—(QFabric systems only) (Optional) Display Routing Engine information for a specified Node device.

scc—(TX Matrix routers only) (Optional) Display Routing Engine information for the TX Matrix router (switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display Routing Engine information for the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with 0.

slot—(Systems with multiple Routing Engines) (Optional) Display information for an individual Routing Engine. Replace ***slot*** with 0 or 1. For QFX3500 switches, there is only one Routing Engine, so you do not need to specify the slot number.

Required Privilege Level

view

Related Documentation

- request chassis routing-engine master on page 649
- *Configuring Routing Engine Redundancy*
- *Switching the Global Master and Backup Roles in a Virtual Chassis Configuration*

List of Sample Output

show chassis routing-engine (QFX Series) on page 1508
show chassis routing-engine (OCX Series) on page 1508
show chassis routing engine interconnect-device (QFabric systems) on page 1509
show chassis routing-engine (PTX Series Packet Transport Switch) on page 1509
show chassis routing-engine (EX9200 Switch) on page 1510
show chassis routing-engine (ACX2000 Universal Access Router) on page 1511
show chassis routing-engine (ACX1000 Universal Access Router) on page 1511

Output Fields Table 103 on page 1493 lists the output fields for the **show chassis routing-engine** command. Output fields are listed in the approximate order in which they appear.

Table 103: show chassis routing-engine Output Fields

Field Name	Field Description
Slot	(Systems with single and multiple Routing Engines) Slot number.
Current state	(Systems with multiple Routing Engines) Current state of the Routing Engine: **Master**, **Backup**, or **Disabled**.
Election priority	(Systems with multiple Routing Engines) Election priority for the Routing Engine: **Master** or **Backup**.
Temperature	Temperature of the air flowing past the Routing Engine.
CPU Temperature	Temperature of the CPU.
DRAM	Total DRAM available to the Routing Engine's processor. Starting with Junos OS Release 12.3R1, the DRAM field displays both available memory and installed memory.
Memory utilization	Percentage of Routing Engine memory being used.
CPU utilization	Information about the Routing Engine's CPU utilization: • **User**—Percentage of CPU time being used by user processes. • **Background**—Percentage of CPU time being used by background processes. • **Kernel**—Percentage of CPU time being used by kernel processes. • **Interrupt**—Percentage of CPU time being used by interrupts. • **Idle**—Percentage of CPU time that is idle.
Model	Routing Engine model number.
Serial ID	(Systems with multiple Routing Engines) Identification number of the Routing Engine in this slot.
Start time	Time at which the Routing Engine started running.
Uptime	How long the Routing Engine has been running.
Routing Engine BIOS Version	BIOS version being run by the Routing Engine.

Table 103: show chassis routing-engine Output Fields *(continued)*

Field Name	Field Description
Last reboot reason	Reason for last reboot, including: • **power cycle/failure**—Halt of the Routing Engine using the **halt** command, powering down using the power button on the chassis or any other method (such as removal of the control board or Routing Engine), and then powering back the Routing Engine. A halt of the operating system also occurs if you enter the **request system halt** command. You can enter this command to halt the system operations on the chassis or specific Routing Engines. To restart the software, press any key on the keyboard. • **watchdog**—Reboot due to a hardware watchdog. A watchdog is a hardware monitoring process that examines the health and performance of the router to enable the device to recover from failures. A watchdog checks for problems at certain intervals, and reboots the routing engine if a problem is encountered. • **reset-button reset**—(Not available on the J Series router or EX Series switch) Reboot due to pressing of the reset button on the Routing Engine. • **power-button hard power off**—Reboot due to pressing of the power button on the chassis. A powering down of the software also occurs if you enter the **request system power-off** command. You can enter this command to power down the chassis or specific Routing Engines; you can then restart the software. • **misc hardware reason**—Reboot due to miscellaneous hardware reasons. • **thermal shutdown**—Reboot due to the router or switch reaching a critical temperature at which point it is unsafe to continue operations. • **hard disk failure**—Reboot due to a hard disk or solid-state drive (SSD) failure. • **reset from debugger**—Reboot due to reset from the debugger. • **chassis control reset**—Restart the chassis process that manages PICs, FPCs, and other hardware components. The chassis control module that runs the Routing Engine performs management and monitoring functions, and it provides a single access point for operational and maintenance functions. A reset of the chassis management process occurs when you enter the **restart chassis-control** command. • **bios auto recovery reset**—Reboot due to a BIOS auto-recovery reset. • **could not be determined**—Reboot due to an undetermined reason. • **Router rebooted after a normal shutdown**—Reboot due to a normal shutdown. This reason is displayed if the Routing Engine is powered down by pushing and holding the online/offline button on the Routing Engine faceplate for 30 seconds, and then powered back. A reboot of the software also occurs if you enter the **request system reboot** command. You can enter this command to reboot the chassis or specific Routing Engines.
Load averages	Routing Engine load averages for the last 1, 5, and 15 minutes.

Sample Output

show chassis routing-engine (M5 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
    Temperature                 25 degrees C / 77 degrees F
    DRAM                       768 MB
    Memory utilization          21 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
```



```
    Idle                      100 percent
  Model                           RE-2.0
  Serial ID                       31000007349bf701
  Start time                      2003-12-04 09:42:17 PST
  Uptime                          26 days, 1 hour, 12 minutes, 27 seconds
  Last reboot reason              Router rebooted after a normal shutdown
  Load averages:                  1 minute   5 minute  15 minute
                                      0.00       0.01       0.00
```

show chassis routing-engine (M10 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
    Temperature                 25 degrees C / 77 degrees F
    DRAM                       768 MB
    Memory utilization          21 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    Model                          RE-2.0
    Serial ID                      31000007349bf701
    Start time                     2003-12-04 09:42:17 PST
    Uptime                         26 days, 1 hour, 12 minutes, 27 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.01       0.00
```

show chassis routing-engine (M20 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 29 degrees C / 84 degrees F
    DRAM                       768 MB
    Memory utilization          20 percent
    CPU utilization:
      User                       1 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      97 percent
    Model                          RE-2.0
    Serial ID                      58000007348d9a01
    Start time                     2003-12-30 07:05:47 PST
    Uptime                        3 hours, 41 minutes, 14 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.02       0.00
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 29 degrees C / 84 degrees F
    DRAM                       768 MB
    Memory utilization           0 percent
    CPU utilization:
```



```
    User                    0 percent
    Background              0 percent
    Kernel                  1 percent
    Interrupt               0 percent
    Idle                   99 percent
  Model                       RE-2.0
  Serial ID                   d800000734745701
  Start time                  2003-06-17 16:37:33 PDT
  Uptime                     195 days, 18 hours, 47 minutes, 9 seconds
  Last reboot reason          Router rebooted after a normal shutdown
```

show chassis routing-engine (M40 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
    Temperature                 25 degrees C / 77 degrees F
    DRAM                       768 MB
    Memory utilization          21 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    Model                          RE-2.0
    Serial ID                      31000007349bf701
    Start time                     2003-12-04 09:42:17 PST
    Uptime                         26 days, 1 hour, 12 minutes, 27 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.01       0.00
```

show chassis routing-engine (M120 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 46 degrees C / 114 degrees F
    CPU temperature             44 degrees C / 111 degrees F
    DRAM                      2048 MB
    Memory utilization          18 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     5 percent
      Interrupt                  0 percent
      Idle                      95 percent
    Model                          RE-A-1000
    Serial ID                      1000621154
    Start time                     2006-10-31 17:10:05 PST
    Uptime                         14 minutes, 31 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.02       0.07       0.07
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 45 degrees C / 113 degrees F
```



```
    CPU temperature              42 degrees C / 107 degrees F
    DRAM                       2048 MB
    Memory utilization           15 percent
    CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      0 percent
      Interrupt                   0 percent
      Idle                      100 percent
    Model                           RE-A-1000
    Serial ID                       1000621151
    Start time                      2006-10-31 17:10:04 PST
    Uptime                          14 minutes, 30 seconds
    Last reboot reason              Router rebooted after a normal shutdown
```

show chassis routing-engine (M160 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                   Master
    Election priority               Master (default)
    Temperature                  43 degrees C / 109 degrees F
    DRAM                       2048 MB
    Memory utilization           11 percent
    CPU utilization:
      User                        1 percent
      Background                  0 percent
      Kernel                      2 percent
      Interrupt                   0 percent
      Idle                       97 percent
    Model                           RE-3.0
    Serial ID                       210865700403
    Start time                      2003-12-23 12:25:55 PST
    Uptime                         6 days, 22 hours, 33 minutes, 24 seconds
    Last reboot reason              Router rebooted after a normal shutdown
    Load averages:                  1 minute   5 minute  15 minute
                                        0.24       0.13       0.04
Routing Engine status:
  Slot 1:
    Current state                   Backup
    Election priority               Backup (default)
    Temperature                  40 degrees C / 104 degrees F
    DRAM                       2048 MB
    Memory utilization            9 percent
    CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      0 percent
      Interrupt                   0 percent
      Idle                      100 percent
    Model                           RE-3.0
    Serial ID                       210865700332
    Start time                      2003-12-23 12:25:55 PST
    Uptime                         6 days, 22 hours, 33 minutes, 21 seconds
    Last reboot reason              Router rebooted after a normal shutdown
```

show chassis routing-engine (MX104 Router)

```
user@host> show chassis routing-engine
```

```
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 32 degrees C / 89 degrees F
    CPU temperature             42 degrees C / 107 degrees F
    DRAM                      3840 MB (3840 MB installed)
    Memory utilization          18 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     3 percent
      Interrupt                  2 percent
      Idle                      94 percent
    Model                          RE-MX-104
    Serial ID                      CAAR5925
    Start time                     2013-06-05 13:17:08 IST
    Uptime                         1 hour, 15 minutes, 8 seconds
    Last reboot reason             0x200:normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.87       0.90       0.41
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 32 degrees C / 89 degrees F
    CPU temperature             38 degrees C / 100 degrees F
    DRAM                      3840 MB (3840 MB installed)
    Memory utilization          13 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                  2 percent
      Idle                      97 percent
    Model                          RE-MX-104
    Serial ID                      CAAM6369
    Start time                     2013-06-05 13:07:37 IST
    Uptime                         1 hour, 24 minutes, 34 seconds
    Last reboot reason             0x200:normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.19       0.15       0.06
```

show chassis routing-engine (MX240 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Backup
    Election priority              Master (default)
    Temperature                 40 degrees C / 104 degrees F
    CPU temperature             47 degrees C / 116 degrees F
    DRAM                      3584 MB
    Memory utilization           7 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    Model                          RE-S-2000
```



```
    Serial ID                      1000703522
    Start time                     2007-12-19 10:35:40 PST
    Uptime                         16 days, 3 hours, 15 minutes, 23 seconds
    Last reboot reason             Router rebooted after a normal shutdown
```

show chassis routing-engine (MX480 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 41 degrees C / 105 degrees F
    CPU temperature             38 degrees C / 100 degrees F
    DRAM                      2048 MB
    Memory utilization          13 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-S-1300
    Serial ID                      1000697044
    Start time                     2008-01-04 06:46:08 PST
    Uptime                         8 hours, 17 minutes, 16 seconds
    Last reboot reason             Router rebooted after a normal shutdown
```

show chassis routing-engine (MX960 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 37 degrees C / 98 degrees F
    CPU temperature             37 degrees C / 98 degrees F
    DRAM                      2048 MB
    Memory utilization          18 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     4 percent
      Interrupt                  0 percent
      Idle                      96 percent
    Model                          RE-S-1300
    Serial ID                      1000617944
    Start time                     2006-10-26 12:37:13 PDT
    Uptime                         6 days, 4 hours, 59 minutes, 40 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.16       0.08       0.02
```

show chassis routing-engine (MX2010 Router)

```
user@host> show chassis routing-engine

Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 3 degrees C / 37 degrees F
```

```
      CPU temperature              3 degrees C / 37 degrees F
      DRAM                       17152 MB
      Memory utilization           13 percent
      CPU utilization:
        User                        0 percent
        Background                  0 percent
        Kernel                      4 percent
        Interrupt                   2 percent
        Idle                       95 percent
      Model                           RE-S-1800x4
      Serial ID                       9009099704
      Start time                      2012-10-02 14:33:32 PDT
      Uptime                          14 hours, 39 minutes, 39 seconds
      Last reboot reason              Router rebooted after a normal shutdown.
      Load averages:                  1 minute   5 minute  15 minute
                                          0.06       0.05       0.01
  Routing Engine status:
    Slot 1:
      Current state                   Backup
      Election priority               Backup (default)
      Temperature                  1 degrees C / 33 degrees F
      CPU temperature              2 degrees C / 35 degrees F
      DRAM                       17152 MB
      Memory utilization           11 percent
      CPU utilization:
        User                        0 percent
        Background                  0 percent
        Kernel                      0 percent
        Interrupt                   0 percent
        Idle                      100 percent
      Model                           RE-S-1800x4
      Serial ID                       9009099706
      Start time                      2012-10-02 10:36:06 PDT
      Uptime                          18 hours, 36 minutes, 57 seconds
      Last reboot reason              Router rebooted after a normal shutdown.
      Load averages:                  1 minute   5 minute  15 minute
                                          0.01       0.00       0.00
```

show chassis routing-engine (MX2020 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                   Master
    Election priority               Master (default)
    Temperature                  6 degrees C / 42 degrees F
    CPU temperature              6 degrees C / 42 degrees F
    DRAM                       17152 MB
    Memory utilization           14 percent
    CPU utilization:
      User                        1 percent
      Background                  0 percent
      Kernel                      7 percent
      Interrupt                   2 percent
      Idle                       91 percent
    Model                           RE-S-1800x4
    Serial ID                       9009089704
    Start time                      2012-10-02 11:05:24 PDT
    Uptime                          2 days, 15 hours, 49 minutes, 13 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
    Load averages:                  1 minute   5 minute  15 minute
```



```
                                       0.10       0.05       0.01
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 7 degrees C / 44 degrees F
    CPU temperature             5 degrees C / 41 degrees F
    DRAM                      17152 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                      99 percent
    Model                          RE-S-1800x4
    Serial ID                      9009094138
    Start time                     2012-10-02 11:09:57 PDT
    Uptime                         2 days, 15 hours, 44 minutes, 27 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.00       0.00
```

show chassis routing-engine (T320 router)

```
user@host> show chassis routing-engine
Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 51 degrees C / 123 degrees F
    CPU temperature             55 degrees C / 131 degrees F
    DRAM                      3584 MB
    Memory utilization          11 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      97 percent
    Model                          RE-A-2000
    Serial ID                      9009010618
    Start time                     2012-10-10 01:24:05 PDT
    Uptime                         5 days, 10 hours, 49 minutes, 23 seconds
    Last reboot reason             0x1:power cycle/failure
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.05       0.04
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 45 degrees C / 113 degrees F
    CPU temperature             48 degrees C / 118 degrees F
    DRAM                      3584 MB
    Memory utilization           9 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    Model                          RE-A-2000
```

```
    Serial ID                      9009003642
    Start time                     2012-10-10 01:24:04 PDT
    Uptime                         5 days, 10 hours, 49 minutes, 28 seconds
    Last reboot reason             0x1:power cycle/failure
```

show chassis routing-engine (T640 router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 50 degrees C / 122 degrees F
    CPU temperature             58 degrees C / 136 degrees F
    DRAM                      3584 MB
    Memory utilization          14 percent
    CPU utilization:
      User                       1 percent
      Background                 0 percent
      Kernel                     4 percent
      Interrupt                  1 percent
      Idle                      95 percent
    Model                          RE-A-2000
    Serial ID                      1000686556
    Start time                     2012-10-10 01:24:02 PDT
    Uptime                         5 days, 10 hours, 50 minutes, 27 seconds
    Last reboot reason             0x1:power cycle/failure
    Load averages:                 1 minute   5 minute  15 minute
                                       1.24       0.33       0.12
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 44 degrees C / 111 degrees F
    CPU temperature             49 degrees C / 120 degrees F
    DRAM                      3584 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  1 percent
      Idle                      99 percent
    Model                          RE-A-2000
    Serial ID                      1000702739
    Start time                     2012-10-10 01:24:02 PDT
    Uptime                         5 days, 10 hours, 50 minutes, 26 seconds
    Last reboot reason             0x1:power cycle/failure
```

show chassis routing-engine (T1600 router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 48 degrees C / 118 degrees F
    CPU temperature             58 degrees C / 136 degrees F
    DRAM                      3584 MB
    Memory utilization          13 percent
    CPU utilization:
```

```
      User                      0 percent
      Background                0 percent
      Kernel                    3 percent
      Interrupt                 1 percent
      Idle                     96 percent
    Model                         RE-A-2000
    Serial ID                     1000704521
    Start time                    2012-10-10 01:23:41 PDT
    Uptime                        5 days, 10 hours, 46 minutes, 56 seconds
    Last reboot reason            0x1:power cycle/failure
    Load averages:                1 minute   5 minute  15 minute
                                      0.05       0.03       0.01
Routing Engine status:
  Slot 1:
    Current state                 Backup
    Election priority             Backup (default)
    Temperature                44 degrees C / 111 degrees F
    CPU temperature            48 degrees C / 118 degrees F
    DRAM                     3584 MB
    Memory utilization         12 percent
    CPU utilization:
      User                      0 percent
      Background                0 percent
      Kernel                    0 percent
      Interrupt                 0 percent
      Idle                    100 percent
    Model                         RE-A-2000
    Serial ID                     9009006579
    Start time                    2012-10-10 01:23:42 PDT
    Uptime                        5 days, 10 hours, 46 minutes, 54 seconds
    Last reboot reason            0x1:power cycle/failure
```

show chassis routing-engine (T4000 router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                 Master
    Election priority             Master (default)
    Temperature                33 degrees C / 91 degrees F
    CPU temperature            50 degrees C / 122 degrees F
    DRAM                     8960 MB
    Memory utilization         18 percent
    CPU utilization:
      User                      0 percent
      Background                0 percent
      Kernel                    4 percent
      Interrupt                 1 percent
      Idle                     95 percent
    Model                         RE-DUO-1800
    Serial ID                     P737F-002248
    Start time                    2012-02-09 22:49:53 PST
    Uptime                        2 hours, 21 minutes, 35 seconds
    Last reboot reason            Router rebooted after a normal shutdown.
    Load averages:                1 minute   5 minute  15 minute
                                      0.00       0.04       0.00
Routing Engine status:
  Slot 1:
    Current state                 Backup
    Election priority             Backup (default)
    Temperature                32 degrees C / 89 degrees F
```

```
    CPU temperature             46 degrees C / 114 degrees F
    DRAM                      8960 MB
    Memory utilization          24 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                      99 percent
    Model                          RE-DUO-1800
    Serial ID                      P737F-002653
    Start time                     2012-02-08 20:12:51 PST
    Uptime                         1 day, 4 hours, 58 minutes, 28 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
```

show chassis routing-engine (TX Matrix Router)

```
user@host> show chassis routing-engine
scc-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 34 degrees C / 93 degrees F
    CPU temperature             33 degrees C / 91 degrees F
    DRAM                      2048 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-4.0
    Serial ID                      P11123900153
    Start time                     2004-08-05 18:42:05 PDT
    Uptime                        9 days, 22 hours, 49 minutes, 50 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.08       0.07

lcc0-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 33 degrees C / 91 degrees F
    CPU temperature             30 degrees C / 86 degrees F
    DRAM                      2048 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-3.0
    Serial ID                      210865700363
    Start time                     2004-08-05 18:42:05 PDT
```

```
    Uptime                        9 days, 22 hours, 48 minutes, 20 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.02       0.00

lcc2-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 34 degrees C / 93 degrees F
    CPU temperature             35 degrees C / 95 degrees F
    DRAM                      2048 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-4.0
    Serial ID                      P11123900126
    Start time                     2004-08-05 18:42:05 PDT
    Uptime                        9 days, 22 hours, 49 minutes, 4 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.01       0.01       0.0
```

show chassis routing-engine lcc (TX Matrix Router)

```
user@host> show chassis routing-engine 0 lcc 0
lcc0-re0:
--------------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 33 degrees C / 91 degrees F
    CPU temperature             30 degrees C / 86 degrees F
    DRAM                      2048 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-3.0
    Serial ID                      210865700363
    Start time                     2004-08-05 18:42:05 PDT
    Uptime                        7 days, 22 hours, 49 minutes, 6 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.00       0.00
```

show chassis routing-engine bios (TX Matrix Router)

```
user@host> show chassis routing-engine bios
scc-re0:
--------------------------------------------------------------------------
```



```
Routing Engine BIOS Version: V1.0.0
lcc0-re0:
--------------------------------------------------------------------------
Routing Engine BIOS Version: V1.0.17
lcc2-re0:
--------------------------------------------------------------------------
Routing Engine BIOS Version: V1.0.0
```

show chassis routing-engine (TX Matrix Plus Router)

```
user@host> show chassis routing-engine
sfc0-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 27 degrees C / 80 degrees F
    CPU temperature             42 degrees C / 107 degrees F
    DRAM                      3327 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-TXP-SFC
    Serial ID                      737A-1024
    Start time                     2009-05-11 17:39:49 PDT
    Uptime                         3 hours, 45 minutes, 25 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.00       0.00
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 29 degrees C / 84 degrees F
    CPU temperature             43 degrees C / 109 degrees F
    DRAM                      3327 MB
    Memory utilization          11 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    Model                          RE-TXP-SFC
    Serial ID                      737A-1024
    Start time                     2009-05-11 17:08:54 PDT
    Uptime                         4 hours, 16 minutes, 52 seconds
    Last reboot reason             0x1:power cycle/failure

lcc0-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 30 degrees C / 86 degrees F
```

```
    CPU temperature              43 degrees C / 109 degrees F
    DRAM                       3327 MB
    Memory utilization            9 percent
    CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      2 percent
      Interrupt                   0 percent
      Idle                       98 percent
    Model                           RE-TXP-LCC
    Serial ID                       737F-1024
    Start time                      2009-05-11 17:40:32 PDT
    Uptime                          3 hours, 44 minutes, 51 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
    Load averages:                  1 minute   5 minute  15 minute
                                        0.00       0.00       0.00
Routing Engine status:
  Slot 1:
    Current state                   Backup
    Election priority               Backup (default)
    Temperature                  30 degrees C / 86 degrees F
    CPU temperature              43 degrees C / 109 degrees F
    DRAM                       3327 MB
    Memory utilization            9 percent
    CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      0 percent
      Interrupt                   0 percent
      Idle                      100 percent
    Model                           RE-TXP-LCC
    Serial ID                       737F-1024
    Start time                      2009-05-06 17:31:32 PDT
    Uptime                          5 days, 3 hours, 54 minutes, 19 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
```

show chassis routing-engine lcc (TX Matrix Plus Router)

```
user@host> show chassis routing-engine 0 lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                   Master
    Election priority               Master (default)
    Temperature                  30 degrees C / 86 degrees F
    CPU temperature              43 degrees C / 109 degrees F
    DRAM                       3327 MB
    Memory utilization            9 percent
    CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      2 percent
      Interrupt                   0 percent
      Idle                       98 percent
    Model                           RE-TXP-LCC
    Serial ID                       737F-1024
    Start time                      2009-05-11 17:40:32 PDT
    Uptime                          3 hours, 45 minutes, 26 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
    Load averages:                  1 minute   5 minute  15 minute
```

```
                                       0.00       0.00       0.00
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 30 degrees C / 86 degrees F
    CPU temperature             43 degrees C / 109 degrees F
    DRAM                      3327 MB
    Memory utilization           9 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    Model                          RE-TXP-LCC
    Serial ID                      737F-1024
    Start time                     2009-05-06 17:31:32 PDT
    Uptime                         5 days, 3 hours, 54 minutes, 59 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
```

show chassis routing-engine bios (TX Matrix Plus Router)

```
user@host> show chassis routing-engine bios
sfc0-re0:
--------------------------------------------------------------------------
    Routing Engine BIOS Version: V0.0.Z

lcc0-re0:
--------------------------------------------------------------------------
    Routing Engine BIOS Version: V0.0.N
```

show chassis routing-engine (QFX Series)

```
user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
Current state Master
Election priority Master (default)
DRAM 2820 MB
Memory utilization 49 percent
CPU utilization:
User 1 percent
Background 0 percent
Kernel 1 percent
Interrupt 0 percent
Idle 97 percent
Model QFX3500-48S4Q
Serial ID S/N ED3709
Uptime 3 days, 4 hours, 29 minutes, 42 seconds
Last reboot reason 0x200:chassis control reset
Load averages: 1 minute 5 minute 15 minute
0.37 0.26 0.19
```

show chassis routing-engine (OCX Series)

```
user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
Current state Master
Election priority Master (default)
DRAM 2820 MB
```

```
Memory utilization 49 percent
CPU utilization:
User 1 percent
Background 0 percent
Kernel 1 percent
Interrupt 0 percent
Idle 97 percent
Model OCX-1100-48SX-AFI
Serial ID S/N ED3709
Uptime 3 days, 4 hours, 29 minutes, 42 seconds
Last reboot reason 0x200:chassis control reset
Load averages: 1 minute 5 minute 15 minute
0.37 0.26 0.19
```

show chassis routing engine interconnect-device (QFabric systems)

```
user@switch> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 48 degrees C / 118 degrees F
    DRAM                      3312 MB
    Memory utilization          63 percent
    CPU utilization:
      User                      14 percent
      Background                 0 percent
      Kernel                     5 percent
      Interrupt                  0 percent
      Idle                      81 percent
    Model                          RE-QFXC08-CB4S
    Serial ID                      BUILTIN
    Start time                     2011-07-06 13:26:15 UTC
    Uptime                         11 hours, 24 minutes, 57 seconds
    Last reboot reason             0x4:reset-button reset
    Load averages:                 1 minute   5 minute  15 minute
                                       2.62       2.31       2.28
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 39 degrees C / 102 degrees F
    DRAM                      3312 MB
    Memory utilization          59 percent
    CPU utilization:
      User                       9 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                  0 percent
      Idle                      91 percent
    Model                          RE-QFXC08-CB4S
    Serial ID                      BUILTIN
    Start time                     2011-07-06 13:24:58 UTC
    Uptime                         11 hours, 26 minutes, 18 seconds
    Last reboot reason             0x4:reset-button reset
```

show chassis routing-engine (PTX Series Packet Transport Switch)

```
user@switch> show chassis routing-engine
```

```
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 60 degrees C / 140 degrees F
    CPU temperature             76 degrees C / 168 degrees F
    DRAM                      17152 MB
    Memory utilization          11 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     4 percent
      Interrupt                  0 percent
      Idle                      95 percent
    Model                          RE-DUO-2600
    Serial ID                      P737A-002231
    Start time                     2011-12-21 16:54:37 PST
    Uptime                         25 minutes, 44 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.01       0.02       0.06
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 50 degrees C / 122 degrees F
    CPU temperature             64 degrees C / 147 degrees F
    DRAM                      17152 MB
    Memory utilization          10 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                      99 percent
    Model                          RE-DUO-2600
    Serial ID                      P737A-002438
    Start time                     2011-12-21 16:52:26 PST
    Uptime                         27 minutes, 49 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
```

show chassis routing-engine (EX9200 Switch)

```
user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
  Current state                  Master
  Election priority              Master (default)
  Temperature                 35 degrees C / 95 degrees F
  CPU temperature             33 degrees C / 91 degrees F
  DRAM                      8157 MB
    Installed Memory        8192 MB
  Memory utilization          18 percent
CPU utilization:
  User                       1 percent
  Background                 0 percent
  Kernel                     4 percent
  Interrupt                  1 percent
  Idle                      94 percent
Model                          RE-S-EX9200-1800X4
Serial ID                      9009119555
```



```
Start time                     2014-03-12 14:58:05 UTC
Uptime                         1 hour, 41 minutes, 51 seconds
Last reboot reason             Router rebooted after a normal shutdown.
Load averages:                 1 minute   5 minute  15 minute
                               0.02       0.02       0.00
Routing Engine status:
Slot 1:
  Current state                  Backup
  Election priority              Backup (default)

[...Output truncasted...]
```

show chassis routing-engine (ACX2000 Universal Access Router)

```
user@host> show chassis routing-engine
Routing Engine status:
    Temperature                 53 degrees C / 127 degrees F
    DRAM                      1536 MB
    Memory utilization          25 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  1 percent
      Idle                      99 percent
    Model                          RE-ACX-2000
    Start time                     2012-05-09 00:57:07 PDT
    Uptime                         5 days, 3 hours, 16 minutes, 15 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.03       0.05
```

show chassis routing-engine (ACX1000 Universal Access Router)

```
user@host> show chassis routing-engine
Routing Engine status:
    Temperature                 36 degrees C / 96 degrees F
    DRAM                       768 MB
    Memory utilization          50 percent
    CPU utilization:
      User                       3 percent
      Background                 0 percent
      Kernel                     6 percent
      Interrupt                  0 percent
      Idle                      91 percent
    Model                          RE-ACX-1000
    Start time                     2012-05-10 07:12:23 PDT
    Uptime                         4 days, 10 hours, 46 minutes, 53 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.00       0.00
```


show chassis scb

Syntax show chassis scb

Release Information Command introduced before Junos OS Release 7.4.

Description (M40 router only) Display System Control Board (SCB) status information.

Options This command has no options.

Required Privilege Level view

Related Documentation

- *Checklist for Monitoring the SCB*

List of Sample Output show chassis scb on page 1513

Output Fields Table 104 on page 1512 lists the output fields for the **show chassis scb** command. Output fields are listed in the approximate order in which they appear.

Table 104: show chassis scb Output Fields

Field Name	Field Description
Temperature	Temperature of the air passing by the SCB, in degrees Celsius.
CPU utilization	Total percentage of CPU being used by the SCB's processor.
Interrupt utilization	Of the total CPU being used by the SCB's processor, the percentage being used for interrupts.
Heap utilization	Percentage of heap space being used by the SCB's processor.
Buffer utilization	Percentage of buffer space being used by the SCB's processor.
DRAM	Total DRAM available to the SCB's processor.
Start time	Time when the SCB started running.
Uptime	How long the SCB has been running.
Internet Processor memory	Information about the memory of the Internet Processor ASIC on the SCB: • **IP routes**—Number of IP routes known to the Internet Processor. • **MPLS routes**—Number of MPLS routes known to the Internet Processor. • **SRAM banks enabled**—Which SRAM banks are enabled. • **SRAM size**—Size of SCB SRAM, in bytes. • **SRAM used**—Amount of SRAM used, in bytes. • **SRAM utilization**—Percentage of SRAM used.

Sample Output

show chassis scb

```
user@host> show chassis scb
SCB status:
  Temperature:                 30 Centigrade
  CPU utilization:              5 percent
  Interrupt utilization:        0 percent
  Heap utilization:             0 percent
  Buffer utilization:           2 percent
  DRAM:                        64 Mbytes
  Start time:                     1998-10-28 18:35:46 UTC
  Uptime:                         6 minutes, 16 seconds
  Internet Processor memory:
    IP routes:                 16
    MPLS routes:                1
    SRAM banks enabled:       [ 1 1 1 1 ]
    SRAM size:                  4 Mbytes
    SRAM used:                256 bytes
    SRAM utilization:           0 percent
```

show chassis sfb

Syntax

show chassis sfb
< slot *sfb-slot-number*>

Release Information

Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

Display chassis information about the Switch Fabric Board (SFB).

Options

none—Display chassis information about all Switch Fabric Boards.

sfb-slot-number—(Optional) Display chassis information about the specified Switch Fabric Board. For MX2020 and MX2010 routers, replace ***sfb-slot-number*** with a value from 0 through 7.

Required Privilege Level

view

Related Documentation

- request chassis sfb on page 656

List of Sample Output

show chassis sfb (MX2020 Router) on page 1514
show chassis sfb (MX2010 Router) on page 1515

Output Fields

Table 105 on page 1514 lists the output fields for the **show chassis sfb** command. Output fields are listed in the approximate order in which they appear.

Table 105: show chassis sfb Output Fields

Field Name	Field Description
Slot	Slot number.
State	Status of the SFB. • **Online**—The SFB is online and running. • **Offline**— SFB is powered down.
Uptime	How long the Routing Engine has been connected to the SFB and, therefore, how long the SFB has been up and running.

Sample Output

show chassis sfb (MX2020 Router)

```
user@host> show chassis sfb
Slot  State              Uptime
 0    Online              6 hours, 11 minutes, 33 seconds
 1    Online              6 hours, 11 minutes, 27 seconds
 2    Online              6 hours, 11 minutes, 21 seconds
 3    Online              6 hours, 11 minutes, 15 seconds
 4    Online              6 hours, 11 minutes, 8 seconds
```

```
 5    Online                  6 hours, 11 minutes, 2 seconds
 6    Online                  6 hours, 10 minutes, 57 seconds
 7    Online                  6 hours, 10 minutes, 51 seconds
```

show chassis sfb (MX2010 Router)

```
user@host> show chassis sfb
Slot  State                  Uptime
 0    Online                  6 hours, 48 minutes, 28 seconds
 1    Online                  6 hours, 48 minutes, 23 seconds
 2    Online                  6 hours, 48 minutes, 17 seconds
 3    Offline                  --- Restarting unresponsive board ---
 4    Online                  6 hours, 48 minutes, 12 seconds
 5    Online                  6 hours, 48 minutes, 6 seconds
 6    Online                  6 hours, 48 minutes
 7    Online                  6 hours, 47 minutes, 55 seconds
```

show chassis sfm

Syntax

show chassis sfm
<detail <*sfm-slot*>>

Release Information

Command introduced before Junos OS Release 7.4.

Description

(M40e and M160 routers only) Display Switching and Forwarding Module (SFM) status information.

Options

none—Display standard status information about all SFMs.

detail—(Optional) Display detailed SFM status information.

sfm-slot—(Optional) Display status information about the SFM in the specified slot only. For the M40e router, replace ***sfm-slot*** with **0** or **1**. For the M160 router, replace ***sfm-slot*** with a value from **0** through **3**.

Required Privilege Level

view

Related Documentation

- request chassis sfm on page 658
- request chassis sfm master switch on page 657
- *Switching the Global Master and Backup Roles in a Virtual Chassis Configuration*

List of Sample Output

show chassis sfm (M160 Router) on page 1517
show chassis sfm detail (M40e Router) on page 1518
show chassis sfm detail (M160 Router) on page 1518

Output Fields

Table 106 on page 1516 lists the output fields for the **show chassis sfm** command. Output fields are listed in the approximate order in which they appear.

Table 106: show chassis sfm Output Fields

Field Name	Field Description	Level of Output
Slot	Slot number.	All levels
State	Status of the SFM. State can be any of the following: • **Online**—SFM is online and running. • **Online-Standby** (M40e router only)—SFM is online, operating as Standby. • **Offline**—SFM is powered down. • **Empty**—No SFM is present.	All levels
Reason	If the status is **Offline**, reason for this state.	All levels
Temp	Temperature of air passing by the SFM, in degrees Celsius.	none specified
CPU Utilization (%)	Information about CPU usage.	none specified

Table 106: 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

List of Syntax

Syntax on page 1519
Syntax (TX Matrix Router) on page 1519
Syntax (TX Matrix Plus Router) on page 1519
Syntax (PTX Series Packet Transport Routers) on page 1519

Syntax

show chassis sibs

Syntax (TX Matrix Router)

show chassis sibs
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show chassis sibs
<lcc *number* | sfc *number*>

Syntax (PTX Series Packet Transport Routers)

show chassis sibs
<detail>
<*slot*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
detail and ***sib-slot*** options introduced for the PTX Packet Transport Router in Junos OS Release 12.1

Description

(M320,T Series routers, TX Matrix routers, TX Matrix Plus routers, and PTX Series routers only) Display Switch Interface Boards (SIBs) status information.

Options

none—(TX Matrix routers and TX Matrix Plus routers only) On a TX Matrix router, display the SIB status for the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display the SIB status for the TX Matrix Plus router and its attached routers.

detail—(PTX Series) (Optional) Display detailed SIB status information.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display SIB status information for a specified T640 router (line-card chassis or LCC) that is connected to the TX Matrix router. On a TX Matrix Plus router, display SIB status information for a specified T1600 or T4000 router (LCC) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc—(TX Matrix routers only) (Optional) Display SIB status information for the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display SIB status information for the TX Matrix Plus router (switch-fabric chassis or SFC). Replace ***number*** with **0**.

slot—(PTX Series) (Optional) Display status information about the SIB in the specified slot only. The range of values is 0 through 8.

Required Privilege Level
view

Related Documentation

- request chassis sib on page 659
- show chassis spmb sibs on page 1540
- show chassis environment sib on page 920
- *Monitoring the SIBs*
- *M320 SIB Description*
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

Output Fields
Table 107 on page 1520 lists the output fields for the **show chassis sibs** command. Output fields are listed in the approximate order in which they appear.

Table 107: show chassis sibs Output Fields

Field Name	Field Description
Slot	SIB slot number.
Type	(TX Matrix Plus router only) SIB type.

Table 107: show chassis sibs Output Fields *(continued)*

Field Name	Field Description
Uptime	How long the SIB has been up and running.

State	SIB status:
	
	• **Activating**—SIB is coming online; this is a transitional state.
	• **Deactivating**—SIB is going offline; this is a transitional state.
	• **Connected**—SIBs on a T1600 router are connected and trained but are either not online or are spare, because the plane on the TX Matrix Plus router (or switch-fabric chassis) is still offline.
	• **Disconnected**—SIBs on all T640 routers on the TX Matrix router (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.
	On the TX Matrix Plus router with 3D SIBs, the LCC SIB is also disconnected if the F13 SIB is online, but none of the cables are connected or trained.
	• **Online**—SIB is operational and running.
	• **Offline**—SIB is powered down.
	NOTE: If a SIB transitions to the **Offline** state, the command displays an appropriate reason in the output. For instance, if the SIB is taken offline using the **request chassis sib** command, the **show chassis sibs** command displays **--- Offlined by cli command ---** in the output.
	• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic.
	NOTE: **Spare** does not apply to PTX Series Packet Transport Routers, as there are no spare SIBs.
	• **Empty**—No SIB is present.
	• **Fault**—SIB is in an alarmed state in which the SIB's plane is not operational for one of the following reasons:
	  ◦ Onboard fabric ASIC is not operational.
	  ◦ Fiber-optic connector faults.
	  ◦ FPC connector faults.
	  ◦ SIB midplane connector faults.
	• **Check**—SIB is in an alarmed state due to link errors or destination errors. A SIB can transition to the **Check** state from the online or spare state.
	The **Check** state can be caused by the following reasons:
	  ◦ Unsupported FPC installed on a router.
	  ◦ SIB not inserted properly (such as bent pins).
	  ◦ Destination errors are detected on the SIB. In this case, the Packet Forwarding Engine stops using the SIB to send traffic to the affected destination Packet Forwarding Engine. When

Table 107: show chassis sibs Output Fields *(continued)*

Field Name	Field Description

	a Packet Forwarding Engine cannot be reached on that plane or SIB, a destination error is reported against that SIB.
	
	NOTE: For SIBs in the **Check** state, the output displays some additional information:
	
	• In Junos OS Release 9.6 and later, the **Check** state message shows the number of Packet Forwarding Engines in the plane having destination errors. For example, **Check (10 destination errors)** indicates 10 Packet Fowarding Engines cannot be reached on that particular SIB. If there are no destination errors, and if the SIB transitions to the **Check** state because of link errors only, the **Check** state message shows **Check (0 destination errors)**.
	• In Junos OS Release 9.5 and earlier, the **Check** state message shows **Check (destination errors)** if there are Packet Forwarding Engines with destination errors in this plane. However, it does not show the number of Packet Forwarding Engines having destination errors. If there are no destination errors and if the SIB transitions to the **Check** state because of link errors only, the **Check** state message shows **Check (no destination errors)**.
	
	If the SIB is in a **Check** state, because of destination errors, the CLI displays an additional line in the output, **use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details**.
	
	• Link errors are detected on the channel between the SIB and a Packet Forwarding Engine. Link errors can be detected at initialization time or runtime:
	  • Link errors caused by a link training failure at initialization time—The Packet Forwarding Engine does not use the SIB to send traffic. The **show chassis fabric fpcs** command shows **Plane disabled** as status for this link.
	  • Link errors caused by CRC errors detected at runtime—The Packet Forwarding Engine continues to use the SIB to send traffic. The **show chassis fabric fpcs** command shows **Link error** as the status for this link.
	
	NOTE: The **Check** state does not apply to PTX Series Packet Transport Routers.
	
	• **SFC Error**—If an F13 SIB on the TX Matrix Plus router (SFC) transitions to the **Fault** state (for instance, because of link errors), and then if an LCC SIB (connected to the F13 SIB) comes online, the LCC SIB transitions to the **SFC Error** state. This state indicates that the F13 SIB to which the LCC SIB is connected has errors.
	
	NOTE: The **Connected**, **Disconnected**, and **SFC Error** states are only applicable to the SIBs on an LCC.
	
	• **Invalid**—The specific SIB slot is not valid for 4-LCC chassis configuration. See the *TX Matrix Plus Hardware Guide* for more information about the supported SIB slots.

Table 107: show chassis sibs Output Fields *(continued)*

Field Name	Field Description
	NOTE: The **Invalid** state is applicable to TX Matrix Plus routers only.
Fabric links	Indicates status of fabric links on the SIB. • **Active**—All fabric links on SIB are active. Errors detected on the SIB's fabric links, if any, are reported in the Errors column. • **Unused**—All fabric links on the SIB are not used for fabric traffic.
Errors	Indicates if there is any error on the SIB. • **None**—No errors • **Link Errors**—Fabric link errors were found on SIB RX link. • **Cell drops**—Fabric cell drops were found on the SIB ASIC. • **Link Errors, Cell drops**—Both link errors and cell drops were detected on at least one of the SIB's fabric links.
Link Errors	indicate the number of links which are marked faulty because the errors on them have crossed threshold.
Cable Errors	Indicate the number of mandatory cables that are not connected, or in up state for that plane
Destination Errors	Indicate the number of destinations that are not reachable on this plane.

Sample Output

show chassis sibs (T640 Router)

```
user@host> show chassis sibs
Slot  State                          Uptime
 0    Empty
 1    Offline                             --- Offlined by cli command ---
 2    Check (21 destination errors)       1 day, 1 hour, 32 minutes, 55 seconds
 3    Check (0 destination errors)        1 day, 1 hour, 32 minutes, 45 seconds
 4    Empty

use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details
```

show chassis sibs (T4000 Router)

```
user@host> show chassis sibs
Slot  State                               Uptime
 0    Spare
 1    Online                              3 hours, 48 minutes, 38 seconds
 2    Online                              3 hours, 48 minutes, 22 seconds
 3    Online                              3 hours, 48 minutes, 5 seconds
 4    Online                              3 hours, 47 minutes, 49 seconds
```


show chassis sibs (TX Matrix Router)

```
user@host> show chassis sibs
scc-re0:
--------------------------------------------------------------------------
Slot  State              Uptime
 0    Empty
 1    Empty
 2    Offline            --- Offlined by cli command ---
 3    Offline
 4    Online             7 days, 21 hours, 50 minutes, 4 seconds
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          Link errors  Destination errors  Uptime
 0    Spare              SIB F13          NONE            NONE
 1    Empty                               NONE            NONE
 2    Invalid                             NONE            NONE
 3    Online             SIB F13          NONE            NONE           1 hour,
53 minutes, 19 seconds
 4    Empty                               NONE            NONE
 5    Invalid                             NONE            NONE
 6    Online             SIB F13          NONE            NONE           1 hour,
53 minutes, 8 seconds
 7    Empty                               NONE            NONE
 8    Online             SIB F13          NONE            NONE           1 hour,
52 minutes, 57 seconds
 9    Empty                               NONE            NONE
10    Invalid                             NONE            NONE
11    Online             SIB F13          NONE            NONE           1 hour,
52 minutes, 46 seconds
12    Empty                               NONE            NONE
13    Invalid                             NONE            NONE
14    Invalid                             NONE            NONE
```



```
15    Invalid                                 NONE             NONE
0/0   Spare              SIB F2S              NONE             NONE
0/2   Spare              SIB F2S              NONE             NONE
0/4   Spare              SIB F2S              NONE             NONE
0/6   Spare              SIB F2S              NONE             NONE
1/0   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 29 seconds
1/2   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 28 seconds
1/4   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 27 seconds
1/6   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 26 seconds
2/0   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 18 seconds
2/2   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 17 seconds
2/4   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 16 seconds
2/6   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 14 seconds
3/0   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 7 seconds
3/2   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 5 seconds
3/4   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 4 seconds
3/6   Online             SIB F2S              NONE             NONE         1 hour,
53 minutes, 3 seconds
4/0   Online             SIB F2S              NONE             NONE         1 hour,
52 minutes, 56 seconds
4/2   Online             SIB F2S              NONE             NONE         1 hour,
52 minutes, 54 seconds
4/4   Online             SIB F2S              NONE             NONE         1 hour,
52 minutes, 53 seconds
4/6   Online             SIB F2S              NONE             NONE         1 hour,
52 minutes, 52 seconds

lcc0-re0:
--------------------------------------------------------------------------
Slot  State              Link errors  Destination errors  Uptime
 0    Spare                 NONE             NONE
 1    Online                NONE             NONE         1 hour, 53 minutes, 31
 seconds
 2    Online                NONE             NONE         1 hour, 53 minutes, 27
 seconds
 3    Online                NONE             NONE         1 hour, 53 minutes, 23
 seconds
 4    Online                NONE             NONE         1 hour, 53 minutes, 19
 seconds
```

show chassis sibs (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis sibs
sfc0-re0:
--------------------------------------------------------------------------
Slot  State              Type          Cable errors  Link errors  Destination
errors  Uptime
 0    Online             SIB F13            6            NONE             NONE
      21 hours, 54 minutes, 28 seconds
 1    Online             SIB F13            8            NONE             NONE
```

```
       21 hours, 54 minutes, 12 seconds
  2    Invalid                        NONE          NONE                NONE
  3    Online          SIB F13         6            NONE                NONE
       21 hours, 57 minutes, 6 seconds
  4    Online          SIB F13         8             1                  NONE
       21 hours, 56 minutes, 49 seconds
  5    Invalid                        NONE          NONE                NONE
  6    Online          SIB F13         6            NONE                NONE
       21 hours, 56 minutes, 25 seconds
  7    Online          SIB F13         8            NONE                NONE
       21 hours, 56 minutes, 8 seconds
  8    Online          SIB F13         6            NONE                NONE
       21 hours, 55 minutes, 43 seconds
  9    Online          SIB F13         8            NONE                NONE
       21 hours, 55 minutes, 26 seconds
 10    Invalid                        NONE          NONE                NONE
 11    Empty                          NONE          NONE                NONE
 12    Empty                          NONE          NONE                NONE
 13    Invalid                        NONE          NONE                NONE
 14    Invalid                        NONE          NONE                NONE
 15    Invalid                        NONE          NONE                NONE
0/0    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 55 minutes, 16 seconds
0/2    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 54 minutes, 49 seconds
0/4    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 54 minutes, 47 seconds
0/6    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 54 minutes, 45 seconds
1/0    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 57 minutes, 29 seconds
1/2    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 57 minutes, 27 seconds
1/4    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 57 minutes, 25 seconds
1/6    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 57 minutes, 23 seconds
2/0    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 56 minutes, 48 seconds
2/2    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 56 minutes, 46 seconds
2/4    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 56 minutes, 43 seconds
2/6    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 56 minutes, 41 seconds
3/0    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 56 minutes, 6 seconds
3/2    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 56 minutes, 4 seconds
3/4    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 56 minutes, 2 seconds
3/6    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 56 minutes
4/0    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 55 minutes, 24 seconds
4/2    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 55 minutes, 22 seconds
4/4    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 55 minutes, 20 seconds
4/6    Online          SIB F2S        -n/a-         NONE                NONE
       21 hours, 55 minutes, 18 seconds
```

```
lcc0-re0:
--------------------------------------------------------------------------
Slot  State            Cable errors  Link errors  Destination errors  Uptime
 0    Online                6           NONE              NONE          21 hours,
47 minutes, 29 seconds
 1    Online                6           NONE              NONE          21 hours,
47 minutes, 50 seconds
 2    Online                6           NONE              NONE          21 hours,
47 minutes, 43 seconds
 3    Online                6           NONE              NONE          21 hours,
47 minutes, 36 seconds
 4    Empty                NONE         NONE              NONE
use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

lcc4-re0:
--------------------------------------------------------------------------
Slot  State            Cable errors  Link errors  Destination errors  Uptime
 0    Online                6           NONE              NONE          21 hours,
57 minutes, 1 second
 1    Online                6           NONE              NONE          21 hours,
57 minutes, 21 seconds
 2    Online                6           NONE              NONE          21 hours,
57 minutes, 14 seconds
 3    Online                6           NONE              NONE          21 hours,
57 minutes, 7 seconds
 4    Empty                NONE         NONE              NONE
use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

lcc7-re0:
--------------------------------------------------------------------------
Slot  State            Cable errors  Link errors  Destination errors  Uptime
 0    Online                2           NONE              NONE          21 hours,
56 minutes, 54 seconds
 1    Online                2           NONE              NONE          21 hours,
57 minutes, 21 seconds
 2    Online                2           NONE              NONE          21 hours,
57 minutes, 12 seconds
 3    Online                2           NONE              NONE          21 hours,
57 minutes, 3 seconds
 4    Empty                NONE         NONE              NONE
use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details
```

show chassis sibs sfc (TX Matrix Plus Router))

```
user@host> show chassis sibs sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Slot  State              Type          Link errors  Destination errors  Uptime
 0    Spare              SIB F13          NONE              NONE
 1    Empty                               NONE              NONE
 2    Invalid                             NONE              NONE
 3    Online            SIB F13          NONE              NONE          12 hours,
 6 minutes, 22 seconds
 4    Empty                               NONE              NONE
 5    Invalid                             NONE              NONE
 6    Online            SIB F13          NONE              NONE          12 hours,
 6 minutes, 11 seconds
 7    Empty                               NONE              NONE
 8    Online            SIB F13          NONE              NONE          12 hours,
 6 minutes
```

```
 9     Empty                             NONE            NONE
10     Invalid                           NONE            NONE
11     Online            SIB F13        NONE            NONE           12 hours,
 5 minutes, 49 seconds
12     Empty                             NONE            NONE
13     Invalid                           NONE            NONE
14     Invalid                           NONE            NONE
15     Invalid                           NONE            NONE
0/0    Spare             SIB F2S         NONE            NONE
0/2    Spare             SIB F2S         NONE            NONE
0/4    Spare             SIB F2S         NONE            NONE
0/6    Spare             SIB F2S         NONE            NONE
1/0    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 32 seconds
1/2    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 31 seconds
1/4    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 30 seconds
1/6    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 29 seconds
2/0    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 21 seconds
2/2    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 20 seconds
2/4    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 19 seconds
2/6    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 17 seconds
3/0    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 10 seconds
3/2    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 9 seconds
3/4    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 7 seconds
3/6    Online            SIB F2S        NONE            NONE           12 hours,
 6 minutes, 6 seconds
4/0    Online            SIB F2S        NONE            NONE           12 hours,
 5 minutes, 59 seconds
4/2    Online            SIB F2S        NONE            NONE           12 hours,
 5 minutes, 57 seconds
4/4    Online            SIB F2S        NONE            NONE           12 hours,
 5 minutes, 56 seconds
4/6    Online            SIB F2S        NONE            NONE           12 hours,
 5 minutes, 55 seconds
```

show chassis sibs lcc (TX Matrix Plus Router)

```
user@host> show chassis sibs lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Slot  State             Link errors  Destination errors  Uptime
 0     Online              NONE            NONE          20 hours, 14 minutes,
50 seconds
 1     Fault               NONE            NONE
 2     Online              NONE            NONE          20 hours, 15 minutes,
2 seconds
 3     Online              NONE            NONE          20 hours, 14 minutes,
58 seconds
 4     Online              NONE            NONE          20 hours, 14 minutes,
54 seconds
```


show chassis sibs lcc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis sibs lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Slot  State           Cable errors  Link errors  Destination errors  Uptime
 0    Disconnected        NONE         NONE              NONE          17 hours,
2 minutes, 37 seconds
 1    Online              NONE         NONE              NONE          17 hours,
3 minutes, 6 seconds
 2    Online              NONE         NONE              NONE          17 hours,
2 minutes, 59 seconds
 3    Online              NONE         NONE              NONE          17 hours,
2 minutes, 52 seconds
 4    Online              NONE         NONE              NONE          17 hours,
2 minutes, 44 seconds
```

show chassis sibs (M320 Router)

```
user@host> show chassis sibs

 0    Online              1 hour, 18 minutes, 3 seconds
 1    Offline             --- Offlined by cli command ---
 2    Online              1 hour, 18 minutes, 18 seconds
 3    Online              1 hour, 18 minutes, 3 seconds
```

show chassis sibs (PTX Series)

```
user@host> show chassis sibs
Slot  State         Fabric links        Errors
0    Online             Active         None
1    Online             Active         Link Errors
2    Online             Active         None
3    Online             Active         Cell drops
4    Offline            Unused         None
5    Online             Active         None
6    Online             Active         None
7    Online             Active         None
8    Online             Active         None
```

show chassis sibs (PTX Series)

```
user@host> show chassis sibs detail
Slot 4 information
  State                             Offline
  Reason                            Offlined by cli command
  Fabric links                      Unused
  Errors                            None
```

show chassis spmb

List of Syntax

Syntax on page 1530
Syntax (T4000 Routers) on page 1530
Syntax (TX Matrix Routers) on page 1530
Syntax (TX Matrix Plus Routers) on page 1530

Syntax

```
show chassis spmb
```

Syntax (T4000 Routers)

```
show chassis spmb
<sibs>
```

Syntax (TX Matrix Routers)

```
show chassis spmb
<sibs>
<lcc number | scc>
```

Syntax (TX Matrix Plus Routers)

```
show chassis spmb
<sibs>
<lcc number | sfc number>
```

Release Information

Command introduced before Junos OS Release 7.4.
sibs option introduced for the T1600 and TX Matrix Plus routers in Junos OS Release 9.6.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

(T Series routers, MX2010 and MX2020 routers only) Display Switch Processor Mezzanine Board (SPMB) status information.

Options

none—(TX Matrix, TX Matrix Plus router , MX2010, and MX2020 routers only) On a TX Matrix router, display SPMB status for the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display SPMB status for the TX Matrix Plus router and its attached routers. On MX2010 and MX2020 routers, display the SPMB status for the routers.

lcc *number*—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix router, display information about the SPMB on a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display information about the SPMB on a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc—(TX Matrix routers only) (Optional) Display information about the SPMB on the TX Matrix router (switch-card chassis).

sfc ***number***—(TX Matrix Plus router only) (Optional) Display information about the SPMB on the TX Matrix Plus router (switch-fabric chassis). Replace ***number*** with **0**.

sibs—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix Plus router, display information about the SIBs on the TX Matrix router (switch-card chassis). On a TX Matrix Plus router, display information about the SIBs on The TX Matrix Plus router (switch-fabric chassis). The **sibs** option has the following sub-options:

lcc ***number*** (TX Matrix, TX Matrix Plus router only) (Optional) On a TX Matrix router, display information about the SIBs on a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display information about the SIBs on a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc ***number***—(TX Matrix routers only) (Optional) Display information about the SIBs on the TX Matrix router (switch-card chassis). Replace ***number*** variable with **0**.

sfc ***number***—(TX Matrix Plus router only) (Optional) Display information about the SIBs on the TX Matrix Plus router (switch-fabric chassis). Replace ***number*** variable with **0**.

Required Privilege Level

view

Related Documentation

- request chassis sib on page 659
- request chassis spmb restart on page 668
- show chassis spmb sibs on page 1540

List of Sample Output

show chassis spmb (T1600 Router) on page 1534
show chassis spmb sibs (T1600 Router) on page 1534
show chassis spmb (TX Matrix Plus Router) on page 1534
show chassis spmb lcc (TX Matrix Plus Router) on page 1536
show chassis spmb scc (TX Matrix Plus Router) on page 1536
show chassis spmb sibs (TX Matrix Plus Router) on page 1537
show chassis spmb lcc (TX Matrix Plus router with 3D SIBs) on page 1538
show chassis spmb sfc (TX Matrix Plus router with 3D SIBs) on page 1538

Output Fields Table 108 on page 1532 lists the output fields for the **show chassis spmb** command. Output fields are listed in the approximate order in which they appear.

Table 108: show chassis spmb Output Fields

Field Name	Field Description
Slot	SPMB slot number: **0** or **1**.
State	SPMB status: • **Online**—SPMB is operational and running. • **Offline**—SPMB is powered down.
Total CPU Utilization (%)	Total percentage of CPU being used by the SPMB processor.
Interrupt CPU Utilization (%)	Of the total CPU being used by the SPMB processor, the percentage being used for interrupts.
Memory Heap Utilization (%)	Percentage of heap space (dynamic memory) being used by the FPC processor. If this number exceeds 80 percent, there may be a software problem (memory leak).
Buffer Utilization (%)	Percentage of buffer space being used by the SPMB processor for buffering internal messages.
Start time	Time at which the SPMB last came online.
Uptime	How long the SPMB has been up and running.

Sample Output

show chassis spmb

```
user@host> show chassis spmb
Slot 0 information:
  State                           Online
  Total CPU Utilization              1%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                40%
  Start time:                     2001-08-27 14:05:04 PDT
  Uptime:                          46 minutes, 36 seconds
```


show chassis spmb (MX2010 Router)

```
user@host> show chassis spmb
Slot 0 information:
  State                          Online
  Total CPU Utilization            12%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           1%
  Buffer Utilization               22%
  Start time:                    2012-10-04 15:34:29 PDT
  Uptime:                        7 hours, 10 minutes, 15 seconds
Slot 1 information:
  State                          Online - Standby
  Total CPU Utilization             1%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               22%
  Start time:                    2012-10-02 14:34:54 PDT
  Uptime:                        2 days, 8 hours, 9 minutes, 50 seconds
```

show chassis spmb (MX2020 Router)

```
user@host> show chassis spmb
Slot 0 information:
  State                          Online
  Total CPU Utilization           100%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           3%
  Buffer Utilization               22%
  Start time:                    2012-10-03 14:58:26 PDT
  Uptime:                        1 day, 12 hours, 16 minutes, 14 seconds
Slot 1 information:
  State                          Online - Standby
  Total CPU Utilization             0%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               22%
  Start time:                    2012-10-03 14:58:27 PDT
  Uptime:                        1 day, 12 hours, 16 minutes, 13 seconds
```

show chassis spmb (T4000 Router)

```
user@host> show chassis spmb

Slot 0 information:
  State                          Online
  Total CPU Utilization            18%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               22%
  Start time:                    2012-02-09 22:51:09 PST
  Uptime:                        2 hours, 25 minutes, 45 seconds
Slot 1 information:
  State                          Online - Standby
  Total CPU Utilization             0%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               22%
  Start time:                    2012-02-09 22:51:10 PST
  Uptime:                        2 hours, 25 minutes, 44 seconds
```


show chassis spmb lcc (TX Matrix Router)

```
user@host> show chassis spmb lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                42%
  Start time:                     2004-08-05 18:43:38 PDT
  Uptime:                         8 days, 55 minutes, 52 seconds
```

show chassis spmb scc (TX Matrix Router)

```
user@host> show chassis spmb scc
scc-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online
  Total CPU Utilization              1%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                42%
  Start time:                     2004-08-05 18:43:37 PDT
  Uptime:                         8 days, 1 hour, 6 minutes, 51 seconds
```

show chassis spmb (T1600 Router)

```
user@host> show chassis spmb
Slot 0 information:
  State                           Online
  Total CPU Utilization              2%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-07 22:34:03 PDT
  Uptime:                         3 days, 4 hours, 14 minutes, 33 seconds
Slot 1 information:
  State                           Online - Standby
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-07 22:34:02 PDT
  Uptime:                         3 days, 4 hours, 14 minutes, 34 seconds
```

show chassis spmb sibs (T1600 Router)

```
user@host> show chassis spmb sibs
Slot  State                Uptime
 0    Check               3 days, 4 hours, 11 minutes, 59 seconds
 1    Disconnected        3 days, 4 hours, 12 minutes, 36 seconds
 2    Disconnected        3 days, 4 hours, 12 minutes, 26 seconds
 3    Disconnected        3 days, 4 hours, 12 minutes, 17 seconds
 4    Disconnected        3 days, 4 hours, 12 minutes, 8 seconds
```

show chassis spmb (TX Matrix Plus Router)

```
user@host> show chassis spmb
```

```
sfc0-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                               Online
  Total CPU Utilization                 84%
  Interrupt CPU Utilization              0%
  Memory Heap Utilization                0%
  Buffer Utilization                    24%
  Start time:                         2009-05-11 01:25:20 PDT
  Uptime:                             46 minutes, 6 seconds
Slot 1 information:
  State                               Online - Standby
  Total CPU Utilization                  0%
  Interrupt CPU Utilization              0%
  Memory Heap Utilization                0%
  Buffer Utilization                    24%
  Start time:                         2009-05-11 01:25:20 PDT
  Uptime:                             46 minutes, 6 seconds

lcc0-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                               Online - Standby
  Total CPU Utilization                  0%
  Interrupt CPU Utilization              0%
  Memory Heap Utilization                0%
  Buffer Utilization                    24%
  Start time:                         2009-05-11 01:25:09 PDT
  Uptime:                             46 minutes, 24 seconds
Slot 1 information:
  State                               Online
  Total CPU Utilization                  5%
  Interrupt CPU Utilization              0%
  Memory Heap Utilization                0%
  Buffer Utilization                    24%
  Start time:                         2009-05-11 01:25:08 PDT
  Uptime:                             46 minutes, 25 seconds

lcc1-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                               Online - Standby
  Total CPU Utilization                  1%
  Interrupt CPU Utilization              0%
  Memory Heap Utilization                0%
  Buffer Utilization                    24%
  Start time:                         2009-05-11 01:25:09 PDT
  Uptime:                             46 minutes, 24 seconds
Slot 1 information:
  State                               Online
  Total CPU Utilization                  5%
  Interrupt CPU Utilization              0%
  Memory Heap Utilization                0%
  Buffer Utilization                    24%
  Start time:                         2009-05-11 01:25:10 PDT
  Uptime:                             46 minutes, 23 seconds

lcc2-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                               Online - Standby
```



```
  Total CPU Utilization           0%
  Interrupt CPU Utilization       0%
  Memory Heap Utilization         0%
  Buffer Utilization             24%
  Start time:                  2009-05-11 01:25:08 PDT
  Uptime:                      46 minutes, 25 seconds
Slot 1 information:
  State                        Online
  Total CPU Utilization           5%
  Interrupt CPU Utilization       0%
  Memory Heap Utilization         0%
  Buffer Utilization             24%
  Start time:                  2009-05-11 01:25:10 PDT
  Uptime:                      46 minutes, 23 seconds

lcc3-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                        Online - Standby
  Total CPU Utilization           1%
  Interrupt CPU Utilization       0%
  Memory Heap Utilization         0%
  Buffer Utilization             24%
  Start time:                  2009-05-11 01:25:10 PDT
  Uptime:                      46 minutes, 23 seconds
Slot 1 information:
  State                        Online
  Total CPU Utilization           5%
  Interrupt CPU Utilization       0%
  Memory Heap Utilization         0%
  Buffer Utilization             24%
  Start time:                  2009-05-11 01:25:09 PDT
  Uptime:                      46 minutes, 24 seconds
```

show chassis spmb lcc (TX Matrix Plus Router)

```
user@host> show chassis spmb lcc 2
lcc2-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                        Online - Standby
  Total CPU Utilization           0%
  Interrupt CPU Utilization       0%
  Memory Heap Utilization         0%
  Buffer Utilization             24%
  Start time:                  2009-05-11 01:25:08 PDT
  Uptime:                      45 minutes, 18 seconds
Slot 1 information:
  State                        Online
  Total CPU Utilization           6%
  Interrupt CPU Utilization       0%
  Memory Heap Utilization         0%
  Buffer Utilization             24%
  Start time:                  2009-05-11 01:25:10 PDT
  Uptime:                      45 minutes, 16 seconds
```

show chassis spmb scc (TX Matrix Plus Router)

```
user@host> show chassis spmb sfc 0
sfc0-re0:
--------------------------------------------------------------------------
```



```
Slot 0 information:
  State                          Online
  Total CPU Utilization            87%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               24%
  Start time:                    2009-05-11 01:25:20 PDT
  Uptime:                        43 minutes, 32 seconds
Slot 1 information:
  State                          Online - Standby
  Total CPU Utilization             0%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               24%
  Start time:                    2009-05-11 01:25:20 PDT
  Uptime:                        43 minutes, 32 seconds
```

show chassis spmb sibs (TX Matrix Plus Router)

```
user@host> show chassis spmb sibs
sfc0-re0:
--------------------------------------------------------------------------
Slot  State               Type          Uptime
 0    Online              SIB F13        1 hour, 18 minutes, 54 seconds
 1    Online              SIB F13        1 hour, 18 minutes, 45 seconds
 2    Invalid
 3    Online              SIB F13        1 hour, 20 minutes, 21 seconds
 4    Online              SIB F13        1 hour, 20 minutes, 18 seconds
 5    Invalid
 6    Online              SIB F13        1 hour, 19 minutes, 51 seconds
 7    Fault               SIB F13
 8    Online              SIB F13        1 hour, 19 minutes, 17 seconds
 9    Online              SIB F13        1 hour, 19 minutes, 13 seconds
10    Invalid
11    Online              SIB F13        1 hour, 17 minutes, 54 seconds
12    Online              SIB F13        1 hour, 17 minutes, 51 seconds
13    Invalid
14    Invalid
15    Invalid
0/0   Online              SIB F2S        1 hour, 18 minutes, 52 seconds
0/2   Online              SIB F2S        1 hour, 18 minutes, 51 seconds
0/4   Online              SIB F2S        1 hour, 18 minutes, 49 seconds
0/6   Online              SIB F2S        1 hour, 18 minutes, 48 seconds
1/0   Online              SIB F2S        1 hour, 20 minutes, 16 seconds
1/2   Online              SIB F2S        1 hour, 20 minutes, 15 seconds
1/4   Online              SIB F2S        1 hour, 20 minutes, 14 seconds
1/6   Online              SIB F2S        1 hour, 20 minutes, 13 seconds
2/0   Online              SIB F2S        1 hour, 19 minutes, 48 seconds
2/2   Online              SIB F2S        1 hour, 19 minutes, 47 seconds
2/4   Online              SIB F2S        1 hour, 19 minutes, 46 seconds
2/6   Online              SIB F2S        1 hour, 19 minutes, 44 seconds
3/0   Online              SIB F2S        1 hour, 19 minutes, 24 seconds
3/2   Online              SIB F2S        1 hour, 19 minutes, 22 seconds
3/4   Online              SIB F2S        1 hour, 19 minutes, 21 seconds
3/6   Online              SIB F2S        1 hour, 19 minutes, 20 seconds
4/0   Online              SIB F2S        1 hour, 18 minutes, 2 seconds
4/2   Online              SIB F2S        1 hour, 18 minutes
4/4   Online              SIB F2S        1 hour, 17 minutes, 58 seconds
4/6   Online              SIB F2S        1 hour, 17 minutes, 58 seconds

lcc0-re1:
```



```
--------------------------------------------------------------------------
Slot  State               Uptime
 0    Online             1 hour, 18 minutes, 58 seconds
 1    Online             1 hour, 20 minutes, 25 seconds
 2    Fault
 3    Online             1 hour, 18 minutes, 30 seconds
 4    Online             1 hour, 18 minutes, 28 seconds

lcc1-re1:
--------------------------------------------------------------------------
Slot  State               Uptime
 0    Online             1 hour, 18 minutes, 58 seconds
 1    Online             1 hour, 20 minutes, 26 seconds
 2    Fault
 3    Online             1 hour, 18 minutes, 22 seconds
 4    Online             1 hour, 18 minutes, 20 seconds

lcc2-re1:
--------------------------------------------------------------------------
Slot  State               Uptime
 0    Online             1 hour, 18 minutes, 19 seconds
 1    Online             1 hour, 20 minutes, 25 seconds
 2    Fault
 3    Online             1 hour, 18 minutes, 17 seconds
 4    Online             1 hour, 18 minutes, 15 seconds

lcc3-re1:
--------------------------------------------------------------------------
Slot  State               Uptime
 0    Online             1 hour, 18 minutes, 27 seconds
 1    Online             1 hour, 20 minutes, 24 seconds
 2    Fault
 3    Online             1 hour, 18 minutes, 25 seconds
 4    Online             1 hour, 18 minutes, 23 seconds
```

show chassis spmb lcc (TX Matrix Plus router with 3D SIBs)

```
user@host > show chassis spmb lcc 0
lcc0-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online - Standby
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                 0%
  Start time:                     2013-02-08 00:57:20 PST
  Uptime:                         19 minutes, 43 seconds
Slot 1 information:
  State                           Online
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                22%
  Start time:                     2013-02-08 00:56:59 PST
  Uptime:                         20 minutes, 4 seconds
```

show chassis spmb sfc (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis spmb sfc o
```

```
sfc0-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                          Online
  Total CPU Utilization             0%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization                0%
  Start time:                    2013-02-06 19:16:55 PST
  Uptime:                        1 day, 6 hours, 2 minutes, 59 seconds
Slot 1 information:
  State                          Online - Standby
  Total CPU Utilization             0%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization                0%
  Start time:                    2013-02-06 19:16:53 PST
  Uptime:                        1 day, 6 hours, 3 minutes, 1 second
```


show chassis spmb sibs

List of Syntax

Syntax on page 1540
Syntax (TX Matrix Router) on page 1540
Syntax (TX Matrix Plus Router) on page 1540

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 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 (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display SIB status information for a specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

scc—(TX Matrix router only) (Optional) Display SIB status information for the TX Matrix router (switch-card chassis).

sfc—(TX Matrix Plus router only) (Optional) Display SIB status information for the TX Matrix Plus router (or switch-fabric chassis).

Additional Information

On a T Series router, you can use either this command or the **show chassis sibs** command to produce the same output. The **show chassis sibs** command is supported on the M320 router and on the T Series routers.

Required Privilege Level

view

Related Documentation

- show chassis sibs on page 1519
- request chassis sib on page 659
- request chassis spmb restart on page 668

List of Sample Output

Output Fields

Table 109 on page 1541 lists the output fields for the **show chassis spmb sibs** command. Output fields are listed in the approximate order in which they appear.

Table 109: show chassis spmb sibs Output Fields

Field Name	Field Description

Slot	SIB slot number:
	• T640 router, T1600 router or TX Matrix router—**0** through **4**
	• TX Matrix Plus router:
	  ◦ TXP-F13 SIB Slots—**0** through **16**
	  ◦ TXP-F2S SIB Slots —**0** – **4**/[**0**|**2**|**4**|**6**]
	• T320 router—**0** through **2**

Table 109: show chassis spmb sibs Output Fields *(continued)*

Field Name	Field Description

State	SIB status:
	• **Disconnected**—SIBs on all T640 routers on the TX Matrix router (switch-card chassis) are in the **Disconnected** state, because a SIB on the SCC has gone offline. Likewise, SIBs on all T1600 or T4000 routers on the TX Matrix Plus router (or switch-fabric chassis) are in the **Disconnected** state, because a SIB on the SFC has gone offline.
	• **Online**—SPMB is operational and running.
	• **Offline**—SPMB is powered down.
	• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fail to pass traffic.
	• **Empty**—No SPMB is present.
	• **Fault**— SIB is in alarmed state where the SIB's plane is not operational for the following reasons:
	  • On-board F-chip is not operational.
	  • Fiber optic connector faults.
	  • FPC connector faults.
	  • SIB midplane connector faults.
	• **Check**—SIB is in alarmed state where the SIB's plane is partially operational for the following reasons:
	  • SIB is not inserted properly.
	  • Two or more links between the SIB and PFE fails.

Uptime	How long the SIB has been up and running.

Sample Output

show chassis spmb sibs (T320 Router)

```
user@host> show chassis spmb sibs
Slot  State
 0    Spare
 1    Online
 2    Online
```

show chassis-spmb-sibs (T1600 Router)

```
user@host> show chassis spmb sibs
Slot  State
 0    Spare
 1    Online
 2    Empty
 3    Online
 4    Offline
```

show chassis spmb sibs (T4000 Router)

```
user@host> show chassis spmb sibs

Slot  State                             Uptime
```



```
 0     Spare
 1     Online                            2 hours, 28 minutes, 13 seconds
 2     Online                            2 hours, 27 minutes, 57 seconds
 3     Online                            2 hours, 27 minutes, 40 seconds
 4     Online                            2 hours, 27 minutes, 24 seconds
```

show chassis spmb sibs (TX Matrix Router)

```
user@host> show chassis spmb sibs
Slot  State
 0     Online
 1     Online
 2     Empty
 3     Online
 4     Offline
```

show chassis spmb sibs lcc (TX Matrix Router)

```
user@host> show chassis spmb sibs lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Slot  State               Uptime
 0     Empty
 1     Empty
 2     Empty
 3     Disconnected        8 days, 48 minutes, 58 seconds
 4     Online              8 days, 48 minutes, 57 seconds
```

show chassis spmb sibs scc (TX Matrix Router)

```
user@host> show chassis spmb sibs scc
scc-re0:
--------------------------------------------------------------------------
Slot  State       Uptime
 0     Empty
 1     Empty
 2     Empty
 3     Offline
 4     Online             8 days, 54 minutes, 1 second
```

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.
Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.2 for ACX Series routers.

Description

(ACX Series, M320, M40e,M120, T320, T640, and T1600 routers and PTX Series Packet Transport Routers only) Display information about the external clock source currently used for chassis synchronization.

Options

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 672
- Configuring Clock Synchronization Interface on MX Series Routers on page 309
- show chassis synchronization (MX Series Routers) on page 1550
- *Supported Time Synchronization Standard*
- *Configuring External Clock Synchronization for ACX Series Routers*

List of Sample Output

show chassis synchronization on page 1548
show chassis synchronization master on page 1548
show chassis synchronization backup on page 1548
show chassis synchronization extensive on page 1548
show chassis synchronization (T320, T640, and T1600 Routers) on page 1549
show chassis synchronization (PTX Series Packet Transport Routers) on page 1549
show chassis synchronization extensive (ACX Series Routers) on page 1549

Output Fields

Table 110 on page 1547 lists the output fields for the **show chassis synchronization** command. Output fields are listed in the approximate order in which they appear.show chassis synchronizationshow chassis synchronizationshow chassis synchronization

Table 110: show chassis synchronization Output Fields

Field Name	Field Description
Current state	Indicates current status of external clock sources: • **backup**—Source is currently the backup clock source. • **master**—Source is currently the master clock source. • **Online-Master**—(PTX Series Packet Transport Routers) Source is the master clock. Source is online. • **Online-Standby**—(PTX Series Packet Transport Routers) Source is the standby (backup) clock. Source is online.
Current clock state	Indicates current source of external synchronization: • **internal**—Source is providing its own clocking. • **locked to master CB**—(M320, M40e, and M120 routers) Source is locked to master clock source. • **locked to master SCG**—(T320, T640, and T1600 routers) Source is locked to master clock source. • **locked to master CCG**—(PTX Series Packet Transport Routers) Source is locked to master clock source.
Selected for	Number of seconds this clock has been the master or backup clock source.
Selected since	Timestamp for establishment as master or backup clock source.
Deviation (in ppm)	Difference in clock timing, in parts per million (ppm).
Last deviation (in ppm)	Previous difference in clock timing, if any, in ppm.
Configured sources	Information about clock sources eligible for selection as master clock.
Source	Information about external clock sources.
Priority	Indicates priority of external clock sources: • **primary**—Source is a primary reference. • **secondary**—Source is a secondary reference.
Deviation (in ppm)	Current difference in clock timing, in ppm: • **measuring**—Establishing source deviation. • ***number***—Deviation in ppm.
Last deviation (in ppm)	Previous difference in clock timing, in ppm: • ***number***—Deviation in ppm.
Status	Indicates status of external sources: • **present**—Source is configured and present. • **qualified**—Source is eligible for synchronization source.

Sample Output

show chassis synchronization

```
user@host> show chassis synchronization
Clock Synchronization Status :
  Clock module on CB 0
    Current state             : master
    Current clock state       : internal
      Selected for            : 18 hours, 12 minutes, 43 seconds
      Selected since          : 2008-09-10 03:27:47 PDT
      Deviation (in ppm)      : +0.00
      Last deviation (in ppm): +0.00
Clock Synchronization Status :
  Clock module on CB 1
    Current state             : backup
    Current clock state       : locked to master CB
      Selected for            : 1 day, 12 hours, 49 minutes, 20 seconds
      Selected since          : 2008-09-09 08:51:10 PDT
```

show chassis synchronization master

```
user@host> show chassis synchronization master
Clock Synchronization Status :
  Clock module on CB 0
    Current state             : master
    Current clock state       : internal
      Selected for            : 8 days, 21 minutes, 12 seconds
      Selected since          : 2008-08-27 21:05:40 PDT
      Deviation (in ppm)      : +0.00
      Last deviation (in ppm): +0.00
```

show chassis synchronization backup

```
user@host> show chassis synchronization backup
Clock Synchronization Status :
  Clock module on CB 1
    Current state             : backup
    Current clock state       : locked to master CB
      Selected for            : 34 days, 20 hours, 17 minutes, 8 seconds
      Selected since          : 2008-08-01 01:22:16 PDT
```

show chassis synchronization extensive

```
user@host> show chassis synchronization extensive
Clock Synchronization Status :
  Clock module on CB 0
    Current state             : master
    Current clock state       : internal
      Selected for            : 8 days, 36 minutes, 29 seconds
      Selected since          : 2008-08-27 21:05:40 PDT
      Deviation (in ppm)      : +0.00
      Last deviation (in ppm): +0.00
Clock Synchronization Status :
  Clock module on CB 1
    Current state             : backup
    Current clock state       : locked to master CB
      Selected for            : 34 days, 20 hours, 19 minutes, 53 seconds
      Selected since          : 2008-08-01 01:22:16 PDT
```


show chassis synchronization (T320, T640, and T1600 Routers)

```
user@host> show chassis synchronization
    Clock Synchronization Status :
      Clock module on SCG 0
        Current state              : master
        Current clock state        : locked to external-a
          Selected for             : 2 hours, 28 minutes, 4 seconds
          Selected since           : 2006-02-17 01:12:58 PST
        Configured sources
          Source      Priority    Deviation    Last deviation   Status
                                  (in ppm)     (in ppm)
          external-a  primary     measuring    -0.10            in-use
          external-b  secondary   -0.10        -0.10            qualified
    Clock Synchronization Status :
      Clock module on SCG 1
        Current state              : backup
        Current clock state        : locked to master SCG
          Selected for             : 19 hours, 49 minutes, 14 seconds
          Selected since           : 2006-02-16 07:51:48 PST
        Configured sources
          Source      Priority    Deviation    Last deviation   Status
                                  (in ppm)     (in ppm)
          external-a  primary     -0.25        -0.25            qualified
          external-b  secondary   -0.25        -0.25            qualified
```

show chassis synchronization (PTX Series Packet Transport Routers)

```
user@host> show chassis synchronization
Clock Synchronization Status :
  Clock module on CCG 0
    Current state              : Online - Master
    Current clock state        : internal
      Selected for             : 1 hour, 24 minutes, 21 seconds
      Selected since           : 2011-03-21 15:59:37 PDT
      Deviation (in ppm)       : +0.51
      Last deviation (in ppm): +0.51
Clock Synchronization Status :
  Clock module on CCG 1
    Current state              : Online - Standby
    Current clock state        : locked to master CCG
      Selected for             : 1 hour, 39 minutes, 12 seconds
      Selected since           : 2011-03-21 15:44:46 PDT
```

show chassis synchronization extensive (ACX Series Routers)

```
user@host> show chassis synchronization extensive
Current clock status  : Locked
Clock locked to       : Primary
Configured sources:
Interface           : ce1-0/0/4
Status              : Primary                     Index       : 132
Clock source state  : Clk qualified   Priority    : Default(8)
Configured QL       : PRC                   ESMC QL      : Unknown
Clock source type   : ifd                    Clock Event : Clock locked
Kernel flags        : Up,pri,
```

show chassis synchronization (MX Series Routers)

Syntax

show chassis synchronization
<clock-module <(re0 | re1 | routing-engine (backup | both | local | master | other))>>
<extensive>
<interface *interface-name*>

Release Information

Command introduced in Junos OS Release 10.4.
clock-module option introduced in Junos OS Release 12.2.
Command introduced in Junos OS Release 13.3 for MX2020 routers.

Description

Display information about clocks used for chassis synchronization.

NOTE:

The Switch Control Board (SCB) framer in MX Series routers supports only the first-generation Synchronization Status Message (SSM) format. Therefore, whenever the router needs to transmit an SSM value of st3e or tnc via an external interface, an SSM value of st3 is transmitted. However, on a Synchronous Ethernet interface, an ESMC packet with the unadjusted SSM is transmitted. The term *unadjusted* here means:

- If the **receive-quality** statement at the **[edit chassis synchronization selection-mode]** hierarchy level is configured, the originally received SSM value st3e or tnc (corresponding to the currently active Synchronous Ethernet clock interface) is transmitted.
- If the **configured quality** statement at the **[edit chassis synchronization selection-mode]** hierarchy level is configured, the originally configured SSM value of st3e or tnc (corresponding to the currently active Synchronous Ethernet clock interface) is transmitted.

Note that when the external interface receives an SSM value of either st3e or tnc, the SCB framer does not recognize either of these SSM codes, and therefore, it reports that the Do Not Use (DNU) quality value has been received.

SCBE2 does not support SSM when you configure the following framing format values on the external interface at the **[edit chassis synchronization interfaces external]** hierarchy level:

- sf for the **t1-options** statement
- g704-no-crc for the **e1-options** statement

Options

clock-module—(MX240, MX480, MX960, MX2010, and MX2020 routers with Enhanced MX Switch Control Board only) (Optional) Display clock module information. You can optionally specify one of these Routing Engine qualifiers:

re0—Routing Engine 0

re1—Routing Engine 1

routing-engine (backup | both | local | master | other)—Routing Engine type

extensive—(Optional) Display clock synchronization information in detail.

interface *interface-name*—(Optional) Display clock synchronization information for the specified interface.

Required Privilege Level

maintenance

Related Documentation

- Configuring an External Clock Synchronization Interface for MX Series Routers on page 309
- *Configuring External Clock Synchronization for ACX Series Routers*
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 324
- **request chassis synchronization mode on page 670**
- **show chassis synchronization on page 1546**
- **synchronization (MX Series) on page 581**
- Synchronous Ethernet Overview on page 133

List of Sample Output

Output Fields

Table 111 on page 1552 lists the output fields for the **show chassis synchronization** command. Output fields are listed in the approximate order in which they appear.

Table 111: show chassis synchronization Output Fields

Field Name	Field Description	Level of Output
Current clock status	Indicates the current status of chassis synchronization: • **Locked**—Clock is operational. • **Holdover**—Clock is not operational. • **Freerun**—Clock is locked to the free-run local oscillator.	none
Clock locked to	Indicates whether the clock is locked to either the **primary** source or the **secondary** source.	none
Configured sources	Heading for the list of interfaces configured for chassis synchronization and their subsequent status indicators.	none
Source name	Indicates the configured interface that is the source. The **external** source name indicates the external clock interface.	none
Configured Priority	Indicates the priority configured for the interface.	none
Interface Status	Indicates the status of the interface as **primary**, **secondary**, or **n/a** (external).	none
Configured quality	Indicates the configured quality of the interface. • **prs** —Primary reference source—Stratum 1 • **st2**—Stratum 2 • **tnc**—Transit node clock • **st3e**—Stratum 3E • **st3**—Stratum 3 • **smc**—SONET minimum clock • **st4**—Stratum 4 • **prc**—Primary reference clock • **ssu-a**—Synchronization supply unit A • **ssu-b**—Synchronization supply unit B • **sec**—SDH equipment clock	none
Interface	Indicates the configured interface: • **ge-*fpc/pic/port***—Indicates the interface type and which FPC, PIC, and port are configured.	**extensive**
Status	Indicates the synchronization status of the indicated interface, as follows: • **Primary**—This interface is the selected primary chassis clock source. • **Secondary**—This interface is the selected secondary chassis clock source. • **n/a**—This interface is not a selected clock source.	**extensive**
Index	Unique numeric identifier for the established Synchronous Ethernet configuration.	**extensive**

Table 111: show chassis synchronization Output Fields *(continued)*

Field Name	Field Description	Level of Output
Clock source state	Indicates the status of the Synchronous Ethernet clock source: • **Clk qualified**—The Synchronous Ethernet clock source is qualified. • **n/a**—The Synchronous Ethernet clock source is not qualified.	**extensive**
Priority	Indicates the configured priority. The range is from 1 through 5. The following values indicate whether the parameter is not specified or undefined: • **Default(8)**—The parameter is not specified. • **- -**—The parameter is undefined or out of range.	**extensive**
Configured QL	Indicates the configured source interface quality level (QL), which is dependent on the source interface and option. The following quality levels are supported and the configured QL is indicated: • **prs | st2 | tnc | st3e | st3 | smc | st4**—Network option I QLs • **prc | ssu-a | ssu-b | sec**—Network option II QLs	**extensive**
ESMC QL	Indicates the configured Ethernet Synchronization Message Channel (ESMC) quality level: • **DNU**—Network option I source • **DSU**—Network option II source	**extensive**
Clock source type	Indicates that the configured chassis synchronization clock source is one of the following types: • **ifd**—Uses the free-run local oscillator. • **extern**—Uses a configured qualified clock source.	**extensive**
Clock Event	Indicates the event clock status: • **Clock locked**—Clock is established. • **n/a**—Clock is not established.	**extensive**
Configuration flags	Indicates **Ext** for external interface configuration	
Kernel flags	Indicates the Synchronous Ethernet software operational status: • **Up**—The Synchronous Ethernet software is operational for the configured interface. • **pri**—The source is the selected primary clock source. • **Dn**—The Synchronous Ethernet software is not operational for the configured interface.	**extensive**

Table 111: show chassis synchronization Output Fields *(continued)*

Field Name	Field Description	Level of Output
Ineligibility reason	Indicates the reason the interface is ineligible for the Synchronous Ethernet operation, including the following: • **Link Down**—The link between the Synchronous Ethernet interfaces is not operational. • **Not restored**—The Synchronous Ethernet link has not yet been restored because it is waiting for the specified **wait-to-restore** time to elapse. • **Forbidden slot**—Slot 10 is not supported. • **Interface unit missing**—The unit parameter is not set or is invalid. • **Locked**—The paired interface is not available. • **No cfg**—Synchronous Ethernet is not configured. • **RX Disabled**—The receiving interface is disabled. • **Undefined/invalid QL**—The QL mode is not specified in the configuration or, if specified, is not supported. • **System initialization in progress**—The remote system is performing initialization and not currently available for synchronization. • **Unsupported interface**—The configured interface does not support Synchronous Ethernet.	**extensive**
Clock module on	Indicates whether the clock module is on the Switch Control Board **SCB0** or **SCB1**.	**clock-module**
Current role	Indicates the role of the clock module: • **master**—The clock module is on the primary SCB, which is the active chassis clock source. • **backup**—The clock module is on the backup SCB, which mirrors the state of the active clock.	**clock-module**
Current state	Indicates the state of the clock module: • **freerun**—The clock module is in free-run mode. When the system starts up, the default clock module state is free-run. • **acquiring-lock on**—The clock module is attempting to acquire a lock on the specified clock source. • **locked to**—The clock module is locked to the specified clock source. • **holdover on**—The clock module is in holdover mode on the specified clock source. Prior to the specified clock source becoming invalid, the clock module was locked on the source and holdover data was collected. • **holdover**—The clock module has transitioned into holdover prior to locking on a valid clock source and collecting holdover data.	**clock-module**
Monitored clock sources	Displays information about monitored clock sources.	**clock-module**
Interface	Indicates the interface type and which FPC, PIC, and port are configured: • **external**—External clock source • **ge-*fpc/pic/port***—Line Synchronous Ethernet or PTP slave • **xe-*fpc/pic/port***—Line Synchronous Ethernet or PTP slave	**clock-module**

Table 111: show chassis synchronization Output Fields *(continued)*

Field Name	Field Description	Level of Output
Type	Indicates the type of clock source: • **t1**—BITS T1 framed • **e1**—BITS E1 framed • **2048khz**—BITS unframed 2048 KHz frequency source • **syncE**—Synchronous Ethernet frequency source • **ptp**—PTP slave source • **ptp-hybrid**—PTP slave source using Synchronous Ethernet for frequency	**clock-module**
Status	Indicates the status of the clock source: • **failed**—The clock source is in the failed state. • **qualifying**—The clock source is being qualified. • **qualified**—The clock source is qualified and can be selected as the chassis clock source. • **qualified-selected**—The clock source is qualified and selected as the chassis clock source.	**clock-module**

Sample Output

show chassis synchronization

```
user@host> show chassis synchronization
Current clock status: Locked
Clock locked to : Primary

Configured sources
Source      Configured       Interface       Configured
Name        Priority         Status          Quality

ge-1/0/0       -             Primary         PRC
```

Sample Output

show chassis synchronization extensive

```
user@host> show chassis synchronization extensive
Current clock status: Locked
Clock locked to            : Primary

Configured sources:
Interface           : ge-1/0/0
Status              : Primary        Index : 143
Clock source state  : Clk qualified  Priority : -
Configured QL       : PRC            ESMC QL : DNU
Clock source type   : ifd            Clock Event : Clock locked
Kernel flags        : Up,pri,
```

Sample Output

show chassis synchronization extensive (Synchronous Ethernet with link down)

```
user@host> show chassis synchronization extensive
Current clock status  : Holdover
Configured sources:

Interface           : ge-1/0/2
Status              : n/a           Index       : 142
Clock source state  : n/a           Priority    : Default(8)
Configured QL       : SSU-B         ESMC QL     : DNU
Clock source type   : ifd           Clock Event : n/a
Kernel flags        : Dn,
Ineligibility reason: Link Down,
```

Sample Output

show chassis synchronization extensive (Synchronous Ethernet with physical interface not restored)

```
user@host> show chassis synchronization extensive
Current clock status  : Holdover
Configured sources:

Interface           : ge-1/0/2
Status              : n/a           Index       : 142
Clock source state  : n/a           Priority    : Default(8)
Configured QL       : SSU-B         ESMC QL     : DNU
Clock source type   : ifd           Clock Event : n/a
Kernel flags        : Restoring in 13s,ESMC TX(QL DNU/SSM 0xf),
Ineligibility reason: Not restored,
```

Sample Output

show chassis synchronization extensive (Synchronous Ethernet configured on ineligible slot 10)

```
user@host> show chassis synchronization extensive
Current clock status  : Holdover
Configured sources:

Interface           : ge-10/0/2  # Note: configuration 10/x/y (slot 10), which
does not support Synchronous Ethernet
Status              : n/a           Index       : 142
Clock source state  : n/a           Priority    : Default(8)
Configured QL       : SSU-B         ESMC QL     : DNU
Clock source type   : ifd           Clock Event : n/a
Kernel flags        : Up,
Ineligibility reason: Forbidden slot,
```

Sample Output

show chassis synchronization interface

```
user@host> show chassis synchronization interface ge-1/0/2
Current clock status  : Locked
Clock locked to       : Primary
```


Sample Output

show chassis synchronization clock-module

```
user@host> show chassis synchronization clock-module
Clock module on SCB0
  Current role     : master
  Current state    : locked to ge-4/1/0
    State for      : 0 days, 00 hrs, 00 mins, 15 secs
    State since    : Mon Jun  6 07:29:40 2011
  Monitored clock sources
    Interface      Type         Status
    ge-4/1/0       syncE        qualified-selected
    ge-4/3/0       syncE        qualified
```

show chassis synchronization (configured external clock interface)

```
user@host> show chassis synchronization
Current clock status  : Free-run

Configured interfaces:
Name            Signal type                Rx status      Tx status
external        e1 (g704 ami sa4)          loss of signal squelched

Configured outputs:
Interface       Tx status   Minimum QL   Tx QL
external        squelched   SEC          DNU

Configured sources:
Source         Configured    Interface   Configured
 Name           Priority     Status      Quality
external       Default(6)    n/a         SSU-A
```

show chassis synchronization clock-module (configured external clock interface)

```
user@host> show chassis synchronization clock-module
re0:
--------------------------------------------------------------------------

Clock module on SCB0
  Current role     : master
  Current state    : freerun
    State for      : 2 days, 06 hrs, 16 mins, 57 secs
    State since    : Wed Nov 14 08:02:07 2012
  Monitored clock sources
    Interface      Type         Status
    external       e1           failed
```

show chassis synchronization extensive (configured external clock interface)

```
user@host> show chassis synchronization extensive
Current clock status: Locked
Clock locked to            : Primary

Configured sources:
Interface           : xe-2/0/10
Status              : Primary         Index : 227
Clock source state  : Clk qualified   Priority : Default (8)
Configured QL       : SEC             ESMC QL : SEC
```

```
Clock source type    : ifd              Clock Event : Clock locked
Kernel flags         : Up,pri, ESMC Rx(SSM 0xb),ESMC TX(QL DNU/SSM 0xf),
```

show chassis synchronization clock-module(configured external clock interfaces)

```
user@host> show chassis synchronization clock-module
re0:
--------------------------------------------------------------------------

Clock module on SCB0
  Current role      : master
  Current state     : locked to xe-2/0/10
    State for       : 29 days, 10 hrs, 06 mins, 23 secs
    State since     : Wed Jun 7 21:55:23 2014
  Monitored clock sources
    Interface       Type          Status
    xe-2/0/10       syncE         qualified-selected
```

show chassis synchronization extensive (configured external clock interface)

```
user@host> show chassis synchronization extensive
Current clock status  : Free-run

Configured interfaces:

Name          : external
Signal type   : e1 (g704 ami sa4)
Rx status     : loss of signal
Tx status     : squelched
LED color     : red

Configured outputs:

Interface      : external
Tx status      : squelched (holdover data invalid)
Minimum QL     : SEC              Tx QL         : DNU
Holdover mode  : enabled          Wander filter : disabled
Source mode    : chassis          Source Tx DNU : disabled
Holdover data  : invalid
Current state  : holdover
  State for    : 2 days, 06 hrs, 03 mins, 46 secs
  State since  : Wed Nov 14 08:02:09 2012

Configured sources:

Interface            : external
Status               : n/a            Index       : 0
Clock source state   : n/a            Priority    : Default(6)
Configured QL        : SSU-A          ESMC QL     : DNU
Clock source type    : extern         Clock Event : n/a
Interface State      : Dn,ESMC Rx(SSM 0xf),
Ineligibility reason: Link Down,
```

show chassis temperature-thresholds

List of Syntax

Syntax

```
show chassis temperature-thresholds
```

Syntax (TX Matrix Routers)

show chassis temperature-thresholds
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis temperature-thresholds
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis temperature-thresholds
<all-members>
<local>
<member *member-id*>

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis temperature-thresholds

Syntax (QFX Series)

show chassis temperature-thresholds
<interconnect-device *name*>
<node-device *name*>

Syntax (PTX Series)

show chassis temperature-thresholds

Release Information

Command introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc command introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 11.1 for QFX Series.
Command introduced in Junos OS Release 12.1 for T4000 Core Routers.
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.

Description

Display chassis temperature threshold settings, in degrees Celsius.

Options

none—Display the temperature threshold details.

all-members—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of all member routers in the Virtual Chassis configuration.

interconnect-device ***name***—(QFabric systems only) (Optional) Display the chassis temperature threshold settings of the Interconnect device.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the temperature threshold details of a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display the temperature threshold details of a specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device ***name***—(QFabric systems only) (Optional) Display the chassis temperature threshold settings of the Node device.

scc—(TX Matrix routers only) (Optional) Display the temperature threshold details of the TX Matrix router (switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) On TX Matrix Plus routers, display the temperature threshold details of the TX Matrix Plus router, which is the switch-fabric chassis. Replace *number* with **0**.

Required Privilege Level view

Related Documentation

- *Defining Alarm Thresholds for System Temperature Sensors*

List of Sample Output

Output Fields Table 112 on page 1561 lists the output fields for the **show chassis temperature-thresholds** command. Output fields are listed in the approximate order in which they appear.

Table 112: show chassis temperature-thresholds Output Fields

Field name	Field Description
Item	Chassis component. If per FRU per slot thresholds are configured, the components about which information is displayed include the chassis, the Routing Engines, FPCs, and FEBs. If per FRU per slot thresholds are not configured, the components about which information is displayed include the chassis and the Routing Engines.
Fan speed	NOTE: On the QFX3500 switch and QFX3600 switch, there are four fan speeds: **low**, **medium-low**, **medium-high**, and **high**. The fan speed changes at the threshold when going from a low speed to a higher speed. When the fan speed changes from a higher speed to a lower speed, the temperature changes two degrees below the threshold. Temperature threshold settings, in degrees Celsius, for the fans to operate at normal and high speeds. • **Normal**—The fans operate at normal speed if the component is at or below this temperature and all the fans are present and functioning normally. NOTE: On a TX Matrix Plus router with 3D SIBs, the threshold temperature at the XF junction is set to 70ºC for **Normal** fan speed, which is less than or equal to 4800 RPM. • **High**—The fans operate at high speed if the component has exceeded this temperature or a fan has failed or is missing. NOTE: On a TX Matrix Plus router with 3D SIBs, the threshold temperature at the XF junction is set to 75ºC for **High** fan speed, which is greater than or equal to 5000 RPM. NOTE: For MX480 Routers, there are three fan speeds: **Low**, **Medium**, and **High**. An alarm is not triggered until the temperature exceeds the threshold settings for a yellow alarm or a red alarm.
Yellow alarm	Temperature threshold settings, in degrees Celsius, that trigger a yellow alarm. • **Normal**—The temperature that must be exceeded on the component to trigger a yellow alarm when the fans are running at full speed. • **Bad fan**—The temperature that must be exceeded on the component to trigger a yellow alarm when one or more fans have failed or are missing.

Table 112: show chassis temperature-thresholds Output Fields *(continued)*

Field name	Field Description
Red alarm	Temperature threshold settings, in degrees Celsius, that trigger a red alarm. • **Normal**—The temperature that must be exceeded on the component to trigger a red alarm when the fans are running at full speed. • **Bad fan**—The temperature that must be exceeded on the component to trigger a red alarm when one or more fans have failed or are missing.
Fire Shutdown	(T4000 routers, TX Matrix Plus router with 3D SIBs, and PTX Series Packet Transport Routers only)—Temperature threshold settings, in degrees Celsius, for the network device to shut down.

Sample Output

show chassis temperature-thresholds

```
user@host> show chassis temperature-thresholds

                          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 (MX104 Router)

```
user@host> show chassis temperature-thresholds
       Fan speed      Yellow alarm      Red alarm      Fire Shutdown
                         (degrees C)      (degrees C)     (degrees C)
(degrees C)
Item                     Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Chassis default              48    54       65       55       75       65
100
Routing Engine 0             55    80       95       95      105      100
108
```

show chassis temperature-thresholds (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```
user@host> show chassis temperature-thresholds
Fan speed      Yellow alarm      Red alarm      Fire Shutdown
                          (degrees C)      (degrees C)     (degrees C)
(degrees C)
```

```
Item                      Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Chassis default               48    54       65       55       75       65
100
Routing Engine 0              70    80       95       95      110      110
112
Routing Engine 1              70    80       95       95      110      110
112
FPC 0                         55    60       75       65       90       80
95
FPC 1                         55    60       75       65       90       80
95
FPC 2                         55    60       75       65       90       80
95
FPC 4                         55    60       75       65       90       80
95
FPC 5                         55    60       75       65       90       80
95
```

show chassis temperature-thresholds (MX480 Router with MPC4E)

```
user@ host> show chassis temperature-thresholds
       Fan speed      Yellow alarm      Red alarm      Fire Shutdown
                          (degrees C)       (degrees C)     (degrees C)
(degrees C)
Item                      Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Chassis default               48    54       65       55       75       65
100
Routing Engine 0              70    80       95       95      110      110
112
Routing Engine 1              70    80       95       95      110      110
112
FPC 2                         55    60       75       65       95       80
100
FPC 3                         55    60       75       65       95       80
100
FPC 4                         55    60       75       65       90       80
95
```

show chassis temperature-thresholds (MX2010 Router)

```
user@host> show chassis temperature-thresholds
                  Fan speed       Yellow alarm      Red alarm     Fire Shutdown
                     (degrees C)     (degrees C)      (degrees C)     (degrees C)
Item                   Normal  High    Normal  Bad fan   Normal  Bad fan  Normal
Routing Engine 0        70     80         95       95      110      110      112
Routing Engine 1        70     80         95       95      110      110      112
CB 0 IntakeA-Zone0      60     65         78       75       85       80       95
CB 0 IntakeB-Zone1      60     65         78       75       85       80       95
CB 0 IntakeC-Zone0      60     65         78       75       85       80       95
CB 0 ExhaustA-Zone0     60     65         78       75       85       80       95
CB 0 ExhaustB-Zone1     60     65         78       75       85       80       95
CB 0 TCBC-Zone0         60     65         78       75       85       80       95
CB 1 IntakeA-Zone0      60     65         78       75       85       80       95
CB 1 IntakeB-Zone1      60     65         78       75       85       80       95
CB 1 IntakeC-Zone0      60     65         78       75       85       80       95
CB 1 ExhaustA-Zone0     60     65         78       75       85       80       95
CB 1 ExhaustB-Zone1     60     65         78       75       85       80       95
CB 1 TCBC-Zone0         60     65         78       75       85       80       95
SPMB 0 Intake           56     62         75       63       83       76       95
```

```
SPMB 1 Intake          56     62        75        63        83        76        95
SFB 0 Intake-Zone0     56     62        75        63        82        70        87
SFB 0 Exhaust-Zone1    56     62        75        63        82        70        87
SFB 0 IntakeA-Zone0    56     62        75        63        82        70        87
SFB 0 IntakeB-Zone1    56     62        75        63        82        70        87
SFB 0 Exhaust-Zone0    56     62        75        63        82        70        87
SFB 0 SFB-XF2-Zone1    70     80        90        90       107       107       115
SFB 0 SFB-XF1-Zone0    70     80        90        90       107       107       115
SFB 0 SFB-XF0-Zone0    70     80        90        90       107       107       115
SFB 1 Intake-Zone0     56     62        75        63        82        70        87
SFB 1 Exhaust-Zone1    56     62        75        63        82        70        87
SFB 1 IntakeA-Zone0    56     62        75        63        82        70        87
SFB 1 IntakeB-Zone1    56     62        75        63        82        70        87
SFB 1 Exhaust-Zone0    56     62        75        63        82        70        87
SFB 1 SFB-XF2-Zone1    70     80        90        90       107       107       115
SFB 1 SFB-XF1-Zone0    70     80        90        90       107       107       115
SFB 1 SFB-XF0-Zone0    70     80        90        90       107       107       115
SFB 2 Intake-Zone0     56     62        75        63        82        70        87
SFB 2 Exhaust-Zone1    56     62        75        63        82        70        87
SFB 2 IntakeA-Zone0    56     62        75        63        82        70        87
SFB 2 IntakeB-Zone1    56     62        75        63        82        70        87
SFB 2 Exhaust-Zone0    56     62        75        63        82        70        87
SFB 2 SFB-XF2-Zone1    70     80        90        90       107       107       115
SFB 2 SFB-XF1-Zone0    70     80        90        90       107       107       115
SFB 2 SFB-XF0-Zone0    70     80        90        90       107       107       115
SFB 3 Intake-Zone0     56     62        75        63        82        70        87
SFB 3 Exhaust-Zone1    56     62        75        63        82        70        87
SFB 3 IntakeA-Zone0    56     62        75        63        82        70        87
SFB 3 IntakeB-Zone1    56     62        75        63        82        70        87
SFB 3 Exhaust-Zone0    56     62        75        63        82        70        87
SFB 3 SFB-XF2-Zone1    70     80        90        90       107       107       115
SFB 3 SFB-XF1-Zone0    70     80        90        90       107       107       115
SFB 3 SFB-XF0-Zone0    70     80        90        90       107       107       115
SFB 4 Intake-Zone0     56     62        75        63        82        70        87
SFB 4 Exhaust-Zone1    56     62        75        63        82        70        87
SFB 4 IntakeA-Zone0    56     62        75        63        82        70        87
SFB 4 IntakeB-Zone1    56     62        75        63        82        70        87
SFB 4 Exhaust-Zone0    56     62        75        63        82        70        87
SFB 4 SFB-XF2-Zone1    70     80        90        90       107       107       115
SFB 4 SFB-XF1-Zone0    70     80        90        90       107       107       115
SFB 4 SFB-XF0-Zone0    70     80        90        90       107       107       115
SFB 5 Intake-Zone0     56     62        75        63        82        70        87
SFB 5 Exhaust-Zone1    56     62        75        63        82        70        87
SFB 5 IntakeA-Zone0    56     62        75        63        82        70        87
SFB 5 IntakeB-Zone1    56     62        75        63        82        70        87
SFB 5 Exhaust-Zone0    56     62        75        63        82        70        87
SFB 5 SFB-XF2-Zone1    70     80        90        90       107       107       115
SFB 5 SFB-XF1-Zone0    70     80        90        90       107       107       115
SFB 5 SFB-XF0-Zone0    70     80        90        90       107       107       115
SFB 6 Intake-Zone0     56     62        75        63        82        70        87
SFB 6 Exhaust-Zone1    56     62        75        63        82        70        87
SFB 6 IntakeA-Zone0    56     62        75        63        82        70        87
SFB 6 IntakeB-Zone1    56     62        75        63        82        70        87
SFB 6 Exhaust-Zone0    56     62        75        63        82        70        87
SFB 6 SFB-XF2-Zone1    70     80        90        90       107       107       115
SFB 6 SFB-XF1-Zone0    70     80        90        90       107       107       115
SFB 6 SFB-XF0-Zone0    70     80        90        90       107       107       115
SFB 7 Intake-Zone0     56     62        75        63        82        70        87
SFB 7 Exhaust-Zone1    56     62        75        63        82        70        87
SFB 7 IntakeA-Zone0    56     62        75        63        82        70        87
SFB 7 IntakeB-Zone1    56     62        75        63        82        70        87
```

```
SFB 7 Exhaust-Zone0     56     62     75     63     82     70     87
SFB 7 SFB-XF2-Zone1     70     80     90     90    107    107    115
SFB 7 SFB-XF1-Zone0     70     80     90     90    107    107    115
SFB 7 SFB-XF0-Zone0     70     80     90     90    107    107    115
FPC 0                   55     60     75     65     95     80    100
FPC 1                   55     60     75     65     90     80     95
FPC 2                   55     60     75     65     95     80    100
FPC 3                   55     60     75     65     90     80     95
FPC 4                   55     60     75     65     90     80     95
FPC 5                   55     60     75     65     95     80    100
FPC 6                   55     60     75     65     90     80     95
FPC 7                   55     60     75     65     95     80    100
FPC 8                   55     60     75     65     90     80     95
FPC 9                   55     60     75     65     95     80    100
ADC 0 Intake            56     62     75     63     83     76     95
ADC 0 Exhaust           56     62     75     63     83     76     95
ADC 0 ADC-XF1           70     80     90     90    107    107    115
ADC 0 ADC-XF0           70     80     90     90    107    107    115
ADC 1 Intake            56     62     75     63     83     76     95
ADC 1 Exhaust           56     62     75     63     83     76     95
ADC 1 ADC-XF1           70     80     90     90    107    107    115
ADC 1 ADC-XF0           70     80     90     90    107    107    115
ADC 2 Intake            56     62     75     63     83     76     95
ADC 2 Exhaust           56     62     75     63     83     76     95
ADC 2 ADC-XF1           70     80     90     90    107    107    115
ADC 2 ADC-XF0           70     80     90     90    107    107    115
ADC 3 Intake            56     62     75     63     83     76     95
ADC 3 Exhaust           56     62     75     63     83     76     95
ADC 3 ADC-XF1           70     80     90     90    107    107    115
ADC 3 ADC-XF0           70     80     90     90    107    107    115
ADC 4 Intake            56     62     75     63     83     76     95
ADC 4 Exhaust           56     62     75     63     83     76     95
ADC 4 ADC-XF1           70     80     90     90    107    107    115
ADC 4 ADC-XF0           70     80     90     90    107    107    115
ADC 5 Intake            56     62     75     63     83     76     95
ADC 5 Exhaust           56     62     75     63     83     76     95
ADC 5 ADC-XF1           70     80     90     90    107    107    115
ADC 5 ADC-XF0           70     80     90     90    107    107    115
ADC 6 Intake            56     62     75     63     83     76     95
ADC 6 Exhaust           56     62     75     63     83     76     95
ADC 6 ADC-XF1           70     80     90     90    107    107    115
ADC 6 ADC-XF0           70     80     90     90    107    107    115
ADC 7 Intake            56     62     75     63     83     76     95
ADC 7 Exhaust           56     62     75     63     83     76     95
ADC 7 ADC-XF1           70     80     90     90    107    107    115
ADC 7 ADC-XF0           70     80     90     90    107    107    115
ADC 8 Intake            56     62     75     63     83     76     95
ADC 8 Exhaust           56     62     75     63     83     76     95
ADC 8 ADC-XF1           70     80     90     90    107    107    115
ADC 8 ADC-XF0           70     80     90     90    107    107    115
ADC 9 Intake            56     62     75     63     83     76     95
ADC 9 Exhaust           56     62     75     63     83     76     95
ADC 9 ADC-XF1           70     80     90     90    107    107    115
ADC 9 ADC-XF0           70     80     90     90    107    107    115
```

show chassis temperature-thresholds (MX2020 Router)

```
user@host> show chassis temperature-thresholds
                     Fan speed       Yellow alarm      Red alarm    Fire Shutdown

                      (degrees C)    (degrees C)      (degrees C)    (degrees C)
```

```
Item                    Normal  High   Normal  Bad fan   Normal  Bad fan  Normal
Routing Engine 0          70     80      95      95       110      110     112
Routing Engine 1          70     80      95      95       110      110     112
CB 0 IntakeA-Zone0        60     65      78      75        85       80      95
CB 0 IntakeB-Zone1        60     65      78      75        85       80      95
CB 0 IntakeC-Zone0        60     65      78      75        85       80      95
CB 0 ExhaustA-Zone0       60     65      78      75        85       80      95
CB 0 ExhaustB-Zone1       60     65      78      75        85       80      95
CB 0 TCBC-Zone0           60     65      78      75        85       80      95
CB 1 IntakeA-Zone0        60     65      78      75        85       80      95
CB 1 IntakeB-Zone1        60     65      78      75        85       80      95
CB 1 IntakeC-Zone0        60     65      78      75        85       80      95
CB 1 ExhaustA-Zone0       60     65      78      75        85       80      95
CB 1 ExhaustB-Zone1       60     65      78      75        85       80      95
CB 1 TCBC-Zone0           60     65      78      75        85       80      95
SPMB 0 Intake             56     62      75      63        83       76      95
SPMB 1 Intake             56     62      75      63        83       76      95
SFB 0 Intake-Zone0        56     62      75      63        82       70      87
SFB 0 Exhaust-Zone1       56     62      75      63        82       70      87
SFB 0 IntakeA-Zone0       56     62      75      63        82       70      87
SFB 0 IntakeB-Zone1       56     62      75      63        82       70      87
SFB 0 Exhaust-Zone0       56     62      75      63        82       70      87
SFB 0 SFB-XF2-Zone1       70     80      90      90       107      107     115
SFB 0 SFB-XF1-Zone0       70     80      90      90       107      107     115
SFB 0 SFB-XF0-Zone0       70     80      90      90       107      107     115
SFB 1 Intake-Zone0        56     62      75      63        82       70      87
SFB 1 Exhaust-Zone1       56     62      75      63        82       70      87
SFB 1 IntakeA-Zone0       56     62      75      63        82       70      87
SFB 1 IntakeB-Zone1       56     62      75      63        82       70      87
SFB 1 Exhaust-Zone0       56     62      75      63        82       70      87
SFB 1 SFB-XF2-Zone1       70     80      90      90       107      107     115
SFB 1 SFB-XF1-Zone0       70     80      90      90       107      107     115
SFB 1 SFB-XF0-Zone0       70     80      90      90       107      107     115
SFB 2 Intake-Zone0        56     62      75      63        82       70      87
SFB 2 Exhaust-Zone1       56     62      75      63        82       70      87
SFB 2 IntakeA-Zone0       56     62      75      63        82       70      87
SFB 2 IntakeB-Zone1       56     62      75      63        82       70      87
SFB 2 Exhaust-Zone0       56     62      75      63        82       70      87
SFB 2 SFB-XF2-Zone1       70     80      90      90       107      107     115
SFB 2 SFB-XF1-Zone0       70     80      90      90       107      107     115
SFB 2 SFB-XF0-Zone0       70     80      90      90       107      107     115
SFB 3 Intake-Zone0        56     62      75      63        82       70      87
SFB 3 Exhaust-Zone1       56     62      75      63        82       70      87
SFB 3 IntakeA-Zone0       56     62      75      63        82       70      87
SFB 3 IntakeB-Zone1       56     62      75      63        82       70      87
SFB 3 Exhaust-Zone0       56     62      75      63        82       70      87
SFB 3 SFB-XF2-Zone1       70     80      90      90       107      107     115
SFB 3 SFB-XF1-Zone0       70     80      90      90       107      107     115
SFB 3 SFB-XF0-Zone0       70     80      90      90       107      107     115
SFB 4 Intake-Zone0        56     62      75      63        82       70      87
SFB 4 Exhaust-Zone1       56     62      75      63        82       70      87
SFB 4 IntakeA-Zone0       56     62      75      63        82       70      87
SFB 4 IntakeB-Zone1       56     62      75      63        82       70      87
SFB 4 Exhaust-Zone0       56     62      75      63        82       70      87
SFB 4 SFB-XF2-Zone1       70     80      90      90       107      107     115
SFB 4 SFB-XF1-Zone0       70     80      90      90       107      107     115
SFB 4 SFB-XF0-Zone0       70     80      90      90       107      107     115
SFB 5 Intake-Zone0        56     62      75      63        82       70      87
SFB 5 Exhaust-Zone1       56     62      75      63        82       70      87
SFB 5 IntakeA-Zone0       56     62      75      63        82       70      87
SFB 5 IntakeB-Zone1       56     62      75      63        82       70      87
```

```
SFB 5 Exhaust-Zone0     56     62       75       63      82      70      87
SFB 5 SFB-XF2-Zone1     70     80       90       90     107     107     115
SFB 5 SFB-XF1-Zone0     70     80       90       90     107     107     115
SFB 5 SFB-XF0-Zone0     70     80       90       90     107     107     115
SFB 6 Intake-Zone0      56     62       75       63      82      70      87
SFB 6 Exhaust-Zone1     56     62       75       63      82      70      87
SFB 6 IntakeA-Zone0     56     62       75       63      82      70      87
SFB 6 IntakeB-Zone1     56     62       75       63      82      70      87
SFB 6 Exhaust-Zone0     56     62       75       63      82      70      87
SFB 6 SFB-XF2-Zone1     70     80       90       90     107     107     115
SFB 6 SFB-XF1-Zone0     70     80       90       90     107     107     115
SFB 6 SFB-XF0-Zone0     70     80       90       90     107     107     115
SFB 7 Intake-Zone0      56     62       75       63      82      70      87
SFB 7 Exhaust-Zone1     56     62       75       63      82      70      87
SFB 7 IntakeA-Zone0     56     62       75       63      82      70      87
SFB 7 IntakeB-Zone1     56     62       75       63      82      70      87
SFB 7 Exhaust-Zone0     56     62       75       63      82      70      87
SFB 7 SFB-XF2-Zone1     70     80       90       90     107     107     115
SFB 7 SFB-XF1-Zone0     70     80       90       90     107     107     115
SFB 7 SFB-XF0-Zone0     70     80       90       90     107     107     115
FPC 0                   55     60       75       65      90      80      95
FPC 1                   55     60       75       65      90      80      95
FPC 2                   55     60       75       65      90      80      95
FPC 3                   55     60       75       65      90      80      95
FPC 4                   55     60       75       65      90      80      95
FPC 5                   55     60       75       65      90      80      95
FPC 6                   55     60       75       65      90      80      95
FPC 7                   55     60       75       65      90      80      95
FPC 8                   55     60       75       65      90      80      95
FPC 9                   55     60       75       65      90      80      95
FPC 10                  55     60       75       65      90      80      95
FPC 11                  55     60       75       65      90      80      95
FPC 12                  55     60       75       65      90      80      95
FPC 13                  55     60       75       65      90      80      95
FPC 14                  55     60       75       65      90      80      95
FPC 15                  55     60       75       65      90      80      95
FPC 16                  55     60       75       65      90      80      95
FPC 17                  55     60       75       65      90      80      95
FPC 18                  55     60       75       65      90      80      95
FPC 19                  55     60       75       65      90      80      95
ADC 0 Intake            56     62       75       63      83      76      95
ADC 0 Exhaust           56     62       75       63      83      76      95
ADC 0 ADC-XF1           70     80       90       90     107     107     115
ADC 0 ADC-XF0           70     80       90       90     107     107     115
ADC 1 Intake            56     62       75       63      83      76      95
ADC 1 Exhaust           56     62       75       63      83      76      95
ADC 1 ADC-XF1           70     80       90       90     107     107     115
ADC 1 ADC-XF0           70     80       90       90     107     107     115
ADC 2 Intake            56     62       75       63      83      76      95
ADC 2 Exhaust           56     62       75       63      83      76      95
ADC 2 ADC-XF1           70     80       90       90     107     107     115
ADC 2 ADC-XF0           70     80       90       90     107     107     115
ADC 3 Intake            56     62       75       63      83      76      95
ADC 3 Exhaust           56     62       75       63      83      76      95
ADC 3 ADC-XF1           70     80       90       90     107     107     115
ADC 3 ADC-XF0           70     80       90       90     107     107     115
ADC 4 Intake            56     62       75       63      83      76      95
ADC 4 Exhaust           56     62       75       63      83      76      95
ADC 4 ADC-XF1           70     80       90       90     107     107     115
ADC 4 ADC-XF0           70     80       90       90     107     107     115
ADC 5 Intake            56     62       75       63      83      76      95
```

```
ADC 5 Exhaust          56     62       75       63       83       76       95
ADC 5 ADC-XF1          70     80       90       90      107      107      115
ADC 5 ADC-XF0          70     80       90       90      107      107      115
ADC 6 Intake           56     62       75       63       83       76       95
ADC 6 Exhaust          56     62       75       63       83       76       95
ADC 6 ADC-XF1          70     80       90       90      107      107      115
ADC 6 ADC-XF0          70     80       90       90      107      107      115
ADC 7 Intake           56     62       75       63       83       76       95
ADC 7 Exhaust          56     62       75       63       83       76       95
ADC 7 ADC-XF1          70     80       90       90      107      107      115
ADC 7 ADC-XF0          70     80       90       90      107      107      115
ADC 8 Intake           56     62       75       63       83       76       95
ADC 8 Exhaust          56     62       75       63       83       76       95
ADC 8 ADC-XF1          70     80       90       90      107      107      115
ADC 8 ADC-XF0          70     80       90       90      107      107      115
ADC 9 Intake           56     62       75       63       83       76       95
ADC 9 Exhaust          56     62       75       63       83       76       95
ADC 9 ADC-XF1          70     80       90       90      107      107      115
ADC 9 ADC-XF0          70     80       90       90      107      107      115
ADC 10 Intake          56     62       75       63       83       76       95
ADC 10 Exhaust         56     62       75       63       83       76       95
ADC 10 ADC-XF1         70     80       90       90      107      107      115
ADC 10 ADC-XF0         70     80       90       90      107      107      115
ADC 11 Intake          56     62       75       63       83       76       95
ADC 11 Exhaust         56     62       75       63       83       76       95
ADC 11 ADC-XF1         70     80       90       90      107      107      115
ADC 11 ADC-XF0         70     80       90       90      107      107      115
ADC 12 Intake          56     62       75       63       83       76       95
ADC 12 Exhaust         56     62       75       63       83       76       95
ADC 12 ADC-XF1         70     80       90       90      107      107      115
ADC 12 ADC-XF0         70     80       90       90      107      107      115
ADC 13 Intake          56     62       75       63       83       76       95
ADC 13 Exhaust         56     62       75       63       83       76       95
ADC 13 ADC-XF1         70     80       90       90      107      107      115
ADC 13 ADC-XF0         70     80       90       90      107      107      115
ADC 14 Intake          56     62       75       63       83       76       95
ADC 14 Exhaust         56     62       75       63       83       76       95
ADC 14 ADC-XF1         70     80       90       90      107      107      115
ADC 14 ADC-XF0         70     80       90       90      107      107      115
ADC 15 Intake          56     62       75       63       83       76       95
ADC 15 Exhaust         56     62       75       63       83       76       95
ADC 15 ADC-XF1         70     80       90       90      107      107      115
ADC 15 ADC-XF0         70     80       90       90      107      107      115
ADC 16 Intake          56     62       75       63       83       76       95
ADC 16 Exhaust         56     62       75       63       83       76       95
ADC 16 ADC-XF1         70     80       90       90      107      107      115
ADC 16 ADC-XF0         70     80       90       90      107      107      115
ADC 17 Intake          56     62       75       63       83       76       95
ADC 17 Exhaust         56     62       75       63       83       76       95
ADC 17 ADC-XF1         70     80       90       90      107      107      115
ADC 17 ADC-XF0         70     80       90       90      107      107      115
ADC 18 Intake          56     62       75       63       83       76       95
ADC 18 Exhaust         56     62       75       63       83       76       95
ADC 18 ADC-XF1         70     80       90       90      107      107      115
ADC 18 ADC-XF0         70     80       90       90      107      107      115
ADC 19 Intake          56     62       75       63       83       76       95
ADC 19 Exhaust         56     62       75       63       83       76       95
ADC 19 ADC-XF1         70     80       90       90      107      107      115
ADC 19 ADC-XF0         70     80       90       90      107      107      115
```


show chassis temperature-thresholds (MX2020 Router with MPC4E)

```
user@host> show chassis temperature-thresholds
     Fan speed      Yellow alarm      Red alarm      Fire Shutdown
                     (degrees C)      (degrees C)     (degrees C)      (degrees
C)
Item                 Normal  High   Normal  Bad fan   Normal  Bad fan     Normal
Routing Engine 0        70    80       95       95    110      110        112
Routing Engine 1        70    80       95       95    110      110        112
CB 0 IntakeA-Zone0      60    65       78       75     85       80         95
CB 0 IntakeB-Zone1      60    65       78       75     85       80         95
CB 0 IntakeC-Zone0      60    65       78       75     85       80         95
CB 0 ExhaustA-Zone0     60    65       78       75     85       80         95
CB 0 ExhaustB-Zone1     60    65       78       75     85       80         95
CB 0 TCBC-Zone0         60    65       78       75     85       80         95
CB 1 IntakeA-Zone0      60    65       78       75     85       80         95
CB 1 IntakeB-Zone1      60    65       78       75     85       80         95
CB 1 IntakeC-Zone0      60    65       78       75     85       80         95
CB 1 ExhaustA-Zone0     60    65       78       75     85       80         95
CB 1 ExhaustB-Zone1     60    65       78       75     85       80         95
CB 1 TCBC-Zone0         60    65       78       75     85       80         95
SPMB 0 Intake           56    62       75       63     83       76         95
SPMB 1 Intake           56    62       75       63     83       76         95
SFB 0 Intake-Zone0      56    62       70       70     85       85         89
SFB 0 Exhaust-Zone1     56    62       70       70     85       85         89
SFB 0 IntakeA-Zone0     56    62       70       70     85       85         89
SFB 0 IntakeB-Zone1     56    62       70       70     85       85         89
SFB 0 Exhaust-Zone0     56    62       70       70     85       85         89
SFB 0 SFB-XF2-Zone1     70    75       90       85     95       90        100
SFB 0 SFB-XF1-Zone0     70    75       90       85     95       90        100
SFB 0 SFB-XF0-Zone0     70    75       90       85     95       90        100
SFB 1 Intake-Zone0      56    62       70       70     85       85         89
SFB 1 Exhaust-Zone1     56    62       70       70     85       85         89
SFB 1 IntakeA-Zone0     56    62       70       70     85       85         89
SFB 1 IntakeB-Zone1     56    62       70       70     85       85         89
SFB 1 Exhaust-Zone0     56    62       70       70     85       85         89
SFB 1 SFB-XF2-Zone1     70    75       90       85     95       90        100
SFB 1 SFB-XF1-Zone0     70    75       90       85     95       90        100
SFB 1 SFB-XF0-Zone0     70    75       90       85     95       90        100
SFB 2 Intake-Zone0      56    62       70       70     85       85         89
SFB 2 Exhaust-Zone1     56    62       70       70     85       85         89
SFB 2 IntakeA-Zone0     56    62       70       70     85       85         89
SFB 2 IntakeB-Zone1     56    62       70       70     85       85         89
SFB 2 Exhaust-Zone0     56    62       70       70     85       85         89
SFB 2 SFB-XF2-Zone1     70    75       90       85     95       90        100
SFB 2 SFB-XF1-Zone0     70    75       90       85     95       90        100
SFB 2 SFB-XF0-Zone0     70    75       90       85     95       90        100
SFB 3 Intake-Zone0      56    62       70       70     85       85         89
SFB 3 Exhaust-Zone1     56    62       70       70     85       85         89
SFB 3 IntakeA-Zone0     56    62       70       70     85       85         89
SFB 3 IntakeB-Zone1     56    62       70       70     85       85         89
SFB 3 Exhaust-Zone0     56    62       70       70     85       85         89
SFB 3 SFB-XF2-Zone1     70    75       90       85     95       90        100
SFB 3 SFB-XF1-Zone0     70    75       90       85     95       90        100
SFB 3 SFB-XF0-Zone0     70    75       90       85     95       90        100
SFB 4 Intake-Zone0      56    62       70       70     85       85         89
SFB 4 Exhaust-Zone1     56    62       70       70     85       85         89
SFB 4 IntakeA-Zone0     56    62       70       70     85       85         89
SFB 4 IntakeB-Zone1     56    62       70       70     85       85         89
SFB 4 Exhaust-Zone0     56    62       70       70     85       85         89
SFB 4 SFB-XF2-Zone1     70    75       90       85     95       90        100
```

```
SFB 4 SFB-XF1-Zone0      70     75        90        85        95        90       100
SFB 4 SFB-XF0-Zone0      70     75        90        85        95        90       100
SFB 5 Intake-Zone0       56     62        70        70        85        85        89
SFB 5 Exhaust-Zone1      56     62        70        70        85        85        89
SFB 5 IntakeA-Zone0      56     62        70        70        85        85        89
SFB 5 IntakeB-Zone1      56     62        70        70        85        85        89
SFB 5 Exhaust-Zone0      56     62        70        70        85        85        89
SFB 5 SFB-XF2-Zone1      70     75        90        85        95        90       100
SFB 5 SFB-XF1-Zone0      70     75        90        85        95        90       100
SFB 5 SFB-XF0-Zone0      70     75        90        85        95        90       100
SFB 6 Intake-Zone0       56     62        70        70        85        85        89
SFB 6 Exhaust-Zone1      56     62        70        70        85        85        89
SFB 6 IntakeA-Zone0      56     62        70        70        85        85        89
SFB 6 IntakeB-Zone1      56     62        70        70        85        85        89
SFB 6 Exhaust-Zone0      56     62        70        70        85        85        89
SFB 6 SFB-XF2-Zone1      70     75        90        85        95        90       100
SFB 6 SFB-XF1-Zone0      70     75        90        85        95        90       100
SFB 6 SFB-XF0-Zone0      70     75        90        85        95        90       100
SFB 7 Intake-Zone0       56     62        70        70        85        85        89
SFB 7 Exhaust-Zone1      56     62        70        70        85        85        89
SFB 7 IntakeA-Zone0      56     62        70        70        85        85        89
SFB 7 IntakeB-Zone1      56     62        70        70        85        85        89
SFB 7 Exhaust-Zone0      56     62        70        70        85        85        89
SFB 7 SFB-XF2-Zone1      70     75        90        85        95        90       100
SFB 7 SFB-XF1-Zone0      70     75        90        85        95        90       100
SFB 7 SFB-XF0-Zone0      70     75        90        85        95        90       100
FPC 0                    55     60        75        65        90        80        95
FPC 9                    55     60        75        65        90        80        95
FPC 10                   55     60        75        65        90        80        95
FPC 14                   55     60        75        65        95        80       100
FPC 19                   55     60        75        65        90        80        95
ADC 0 Intake             50     55        60        60        65        65        80
ADC 0 Exhaust            50     55        60        60        65        65        80
ADC 0 ADC-XF1            70     75        90        85        95        90       100
ADC 0 ADC-XF0            70     75        90        85        95        90       100
ADC 9 Intake             50     55        60        60        65        65        80
ADC 9 Exhaust            50     55        60        60        65        65        80
ADC 9 ADC-XF1            70     75        90        85        95        90       100
ADC 9 ADC-XF0            70     75        90        85        95        90       100
ADC 10 Intake            50     55        60        60        65        65        80
ADC 10 Exhaust           50     55        60        60        65        65        80
ADC 10 ADC-XF1           70     75        90        85        95        90       100
ADC 10 ADC-XF0           70     75        90        85        95        90       100
ADC 14 Intake            50     55        60        60        65        65        80
ADC 14 Exhaust           50     55        60        60        65        65        80
ADC 14 ADC-XF1           70     75        90        85        95        90       100
ADC 14 ADC-XF0           70     75        90        85        95        90       100
ADC 19 Intake            50     55        60        60        65        65        80
ADC 19 Exhaust           50     55        60        60        65        65        80
ADC 19 ADC-XF1           70     75        90        85        95        90       100
ADC 19 ADC-XF0           70     75        90        85        95        90       100
```

show chassis temperature-thresholds (T4000 Core Routers)

user@host> **show chassis temperature-thresholds**

```
                    Fan speed      Yellow alarm       Red alarm     Fire Shutdown

                   (degrees C)      (degrees C)      (degrees C)     (degrees C)
Item               Normal  High   Normal  Bad fan  Normal  Bad fan     Normal
Chassis default      48     54      65       55      75       65        100
```

```
Routing Engine 0        55     65        85        85       100       100       102
Routing Engine 1        55     65        85        85       100       100       102
FPC 0                   63     68        75        70        90        83        95
FPC 3                   63     68        75        70        90        83        95
FPC 5                   56     62        75        63        83        76        95
FPC 6                   63     68        75        70        90        83        95
SIB 0                   64     70        76        72        87        84        95
SIB 1                   64     70        76        72        87        84        95
SIB 2                   64     70        76        72        87        84        95
SIB 3                   64     70        76        72        87        84        95
SIB 4                   64     70        76        72        87        84        95
```

show chassis temperature-thresholds (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 (TX Matrix Plus routers with 3D SIBs)

```
user@host> show chassis temperature-thresholds
sfc0-re0:
--------------------------------------------------------------------------
                           Fan speed      Yellow alarm      Red alarm      Fire
Shutdown
                          (degrees C)      (degrees C)      (degrees C)
(degrees C)
Item                      Normal  High    Normal  Bad fan   Normal  Bad fan
Normal
Chassis default              48     54        65       55       75       65
100
Routing Engine 0             70     75        90       87      102       97
115
Routing Engine 1             70     75        90       87      102       97
115
SIB F13 0 Board              60     65        78       75       85       80
95
SIB F13 0 XF Junction        70     75        82       74      105      100
107
SIB F13 4 Board              60     65        78       75       85       80
95
SIB F13 4 XF Junction        70     75        82       74      105      100
107
SIB F13 6 Board              60     65        78       75       85       80
95
SIB F13 6 XF Junction        70     75        82       74      105      100
107
SIB F2S 16 Board             60     65        78       75       85       80
95
SIB F2S 16 XF Junction       70     75        82       74      105      100
107
SIB F2S 17 Board             60     65        78       75       85       80
95
SIB F2S 17 XF Junction       70     75        82       74      105      100
107
SIB F2S 18 Board             60     65        78       75       85       80
95
SIB F2S 18 XF Junction       70     75        82       74      105      100
107
```



```
SIB F2S 19 Board              60     65        78        75        85        80
95
SIB F2S 19 XF Junction        70     75        82        74       105       100
107
SIB F2S 24 Board              60     65        78        75        85        80
95
SIB F2S 24 XF Junction        70     75        82        74       105       100
107
SIB F2S 25 Board              60     65        78        75        85        80
95
SIB F2S 25 XF Junction        70     75        82        74       105       100
107
SIB F2S 26 Board              60     65        78        75        85        80
95
SIB F2S 26 XF Junction        70     75        82        74       105       100
107
SIB F2S 27 Board              60     65        78        75        85        80
95
SIB F2S 27 XF Junction        70     75        82        74       105       100
107

lcc0-re0:
--------------------------------------------------------------------------
                          Fan speed      Yellow alarm      Red alarm      Fire
Shutdown
                         (degrees C)      (degrees C)     (degrees C)
(degrees C)
Item                     Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Chassis default           48     54        65        55        75        65
100
Routing Engine 0          55     65        85        85       100       100
102
FPC 0                     63     68        75        70        90        83
95
FPC 1                     56     62        75        63        83        76
95
FPC 7                     56     62        75        63        83        76
95
SIB 0                     64     70        76        72        87        84
95
SIB 0 ASIC Junction       63     68        75        70       105       100
107
SIB 2                     64     70        76        72        87        84
95
SIB 2 ASIC Junction       63     68        75        70       105       100
107
SIB 3                     64     70        76        72        87        84
95
SIB 3 ASIC Junction       63     68        75        70       105       100
107
```

show chassis temperature-thresholds (QFX3500 Switch and QFX3600)

```
user@switch> show chassis temperature-thresholds
                          Fan speed      Yellow alarm      Red alarm
                         (degrees C)      (degrees C)     (degrees C)
Item                     Normal  High   Normal  Bad fan   Normal  Bad fan
rmal
FPC Sensor TopLeft I      48     56        53        43        56        46
FPC Sensor TopRight I     46     54        51        41        54        44
```

```
FPC Sensor TopLeft E         58    65       62       52       65       55
FPC Sensor TopRight E        56    64       61       51       64       54
FPC Sensor TopMiddle I       58    64       61       51       64       54
FPC Sensor TopMiddle E       67    74       71       61       74       64
FPC Sensor Bottom I          59    67       64       54       67       57
FPC Sensor Bottom E          66    73       70       60       73       63
FPC Sensor Die Temp          69    75       72       62       75       65
FPC Sensor Mgmnt Brd I       46    54       51       41       54       44
FPC Sensor Switch I          56    63       60       50       63       53
```

show chassis temperature-thresholds interconnect-device (QFabric System)

```
user@switch> show chassis temperature-thresholds interconnect-device interconnect1
temperature-thresholds interconnect-device interconnect1
                           Fan speed      Yellow alarm       Red alarm
Item                     Normal  High    Normal  Bad fan    Normal  Bad fan
Chassis default              48     54       65       55        75       65
```

show chassis temperature-thresholds (PTX5000 Packet Transport Router)

```
user@switch> show chassis temperature-thresholds
user@switch> show chassis temperature-thresholds

                          Fan speed      Yellow alarm      Red alarm       Fire
Shutdown
                         (degrees C)     (degrees C)      (degrees C)
(degrees C)
Item                     Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Routing Engine 0             80    90       95       85      105       95
115
CB 0 Exhaust A               60    65       78       75       85       80
95
CB 0 Exhaust B               60    65       78       75       85       80
95
CB 1 Exhaust A               60    65       78       75       85       80
95
CB 1 Exhaust B               60    65       78       75       85       80
95
FPC 3 Exhaust A              80    90       95       85      105       95
115
FPC 3 Exhaust B              80    90       95       85      105       95
115
FPC 3 TL5                    80    90       95       85      105       95
115
FPC 3 TQ5                    80    90       95       85      105       95
115
FPC 3 TL6                    80    90       95       85      105       95
115
FPC 3 TQ6                    80    90       95       85      105       95
115
FPC 3 TL1                    80    90       95       85      105       95
115
FPC 3 TQ1                    80    90       95       85      105       95
115
FPC 3 TL2                    80    90       95       85      105       95
115
FPC 3 TQ2                    80    90       95       85      105       95
115
FPC 3 TL4                    80    90       95       85      105       95
115
```

```
FPC 3 TQ4                    80     90        95        85       105         95
115
FPC 3 TL7                    80     90        95        85       105         95
115
FPC 3 TQ7                    80     90        95        85       105         95
115
FPC 3 TL0                    80     90        95        85       105         95
115
FPC 3 TQ0                    80     90        95        85       105         95
115
FPC 3 TL3                    80     90        95        85       105         95
115
FPC 3 TQ3                    80     90        95        85       105         95
115
SIB 0 Exhaust                60     65        78        75        85         80
95
SIB 0 Junction               75     80        90        85       105         95
115
SIB 1 Exhaust                60     65        78        75        85         80
95
SIB 1 Junction               75     80        90        85       105         95
115
SIB 2 Exhaust                60     65        78        75        85         80
95
SIB 2 Junction               75     80        90        85       105         95
115
SIB 3 Exhaust                60     65        78        75        85         80
95
SIB 3 Junction               75     80        90        85       105         95
115
SIB 4 Exhaust                60     65        78        75        85         80
95
SIB 4 Junction               75     80        90        85       105         95
115
SIB 5 Exhaust                60     65        78        75        85         80
95
SIB 5 Junction               75     80        90        85       105         95
115
SIB 6 Exhaust                60     65        78        75        85         80
95
SIB 6 Junction               75     80        90        85       105         95
115
SIB 7 Exhaust                60     65        78        75        85         80
95
SIB 7 Junction               75     80        90        85       105         95
115
SIB 8 Exhaust                60     65        78        75        85         80
95
SIB 8 Junction               75     80        90        85       105         95
115
```

show chassis temperature-thresholds (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis temperature-thresholds
  Fan speed      Yellow alarm      Red alarm      Fire Shutdown
                          (degrees C)      (degrees C)      (degrees C)
(degrees C)
Item                     Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
```



```
Chassis default              48    54        65        55        75        65
100
Routing Engine 0             70    80        95        95       110       110
112
Routing Engine 1             70    80        95        95       110       110
112
FPC 0                        55    60        75        65        90        80
95
FPC 1                        55    60        75        65        90        80
95
FPC 2                        55    60        75        65        90        80
95
FPC 4                        55    60        75        65        90        80
95
FPC 5                        55    60        75        65        90        80
95
```

show chassis zones (PTX Series Packet Transport Routers)

Syntax

show chassis zones
<detail>

Release Information

Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.

Description

(PTX5000 Packet Transport Router only) Display the status of the two cooling system zones of the chassis. Zone 0 consists of the Routing Engine, Control Board, SIB, PMB, and the CCG, and is cooled by the vertical fan tray. Zone 1 consists of the eight (0–7) FPCs, and their respective PICs, and is cooled by the horizontal fan trays. The vertical fan tray is located at the front of the chassis. One horizontal fan tray is located at the front top of the chassis, and another is located at the front bottom of the chassis.

Options

detail—(Optional) Display status of each FRU and fan belonging to the cooling system zones.

Required Privilege Level

view

Related Documentation

- show chassis fan on page 990
- show chassis temperature-thresholds on page 1559

List of Sample Output

show chassis zones (PTX5000 Packet Transport Router) on page 1578
show chassis zones detail (PTX5000 Packet Transport Router) on page 1579

Output Fields

Table 113 on page 1578 lists the output fields for the **show chassis zones detail** command.

Table 113: show chassis zones detail Output Fields

Field Name	Field Description
Item	Chassis component: • (PTX Series Packet Transport Routers)—Information about the chassis, Routing Engines, Control Boards (CBs), Switch Interface Boards (SIBs), PICs, and Flexible PIC Concentrators (FPCs).
Status	Status of the specified item. Status can be **OK**, **Absent**, or **Offline**.
Measurement	Fan tray speed utilization in percentage.

Sample Output

show chassis zones (PTX5000 Packet Transport Router)

```
user@host> show chassis zones
ZONE 0 Status
    Driving FRU                 Routing Engine 1
    Temperature                 62 degrees C / 143 degrees F
    Condition                   OK
    Num Fans Missing            0
```

```
    Num Fans Failed            0
    Fan Duty Cycle             0

ZONE 1 Status
    Driving FRU                FPC 0 TL0
    Temperature                71 degrees C / 159 degrees F
    Condition                  OK
    Num Fans Missing           0
    Num Fans Failed            0
    Fan Duty Cycle             0
```

show chassis zones detail (PTX5000 Packet Transport Router)

```
user@host> show chassis zones detail
ZONE 0 Status
Item                    Status                  Measurement
CB 0                    OK
CB 1                    OK
Routing Engine 0        OK
Routing Engine 1        OK
SIB 0                   OK
SIB 1                   OK
SIB 2                   OK
SIB 3                   OK
SIB 4                   OK
SIB 5                   Absent
SIB 6                   Absent
SIB 7                   Absent
SIB 8                   Absent
Fan Tray 0              OK                      Spinning at 30% fan tray speed

ZONE 1 Status
Item                    Status                  Measurement
FPC 0                   OK
FPC 1                   OK
FPC 2                   OK
FPC 3                   OK
FPC 4                   OK
FPC 5                   Absent
FPC 6                   Offline
FPC 7                   OK
Fan Tray 1              OK                      Spinning at 33% fan tray speed
Fan Tray 2              OK                      Spinning at 36% fan tray speed
```

show chassis zones

List of Syntax

Syntax on page 1580
Syntax (QFX Series) on page 1580

Syntax

show chassis zones
<detail>

Syntax (QFX Series)

show chassis zones
<detail>
<interconnect-device *name*>

Release Information

Command introduced in Junos OS Release 11.3 for the QFX Series.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

(QFabric systems only) Display the status of the two cooling system zones on the Interconnect device. Zone 1 consists of eight (0 – 7) front cards, which are cooled by two fan trays. Zone 2 consists of two control boards and eight rear cards, which are cooled by eight (0 – 7) fan trays. On MX2010 and MX2020 routers, display the status of the cooling system zones of the chassis. Zone 0 consists of the Control Board, ten (0–9) FPCs, and their respective PICs, Switch Fabric Boards, and Adapter Cards. Zone 1 consists of the Routing Engine, Control Board, and Switch Processor Mezzanine Boards.

Options

detail—(MX2010 and MX2020 routers only) (Optional) Display detailed status of the cooling system zones.

detail *device-name*— (QFabric systems only) (Optional) Display detailed status of the two cooling systems on the Interconnect device.

interconnect-device *name*— (QFabric systems only) (Optional) Display the status of the cooling zones on the Interconnect device.

Required Privilege Level

view

Related Documentation

- *request chassis beacon*
- show chassis fan on page 990
- show chassis temperature-thresholds on page 1559

List of Sample Output

show chassis zones interconnect-device (QFabric System) on page 1581
show chassis zones (MX2010 Router) on page 1581
show chassis zones detail (MX2010 Router) on page 1582
show chassis zones (MX2020 Router) on page 1583
show chassis zones detail (MX2020 Router) on page 1583
show chassis beacon interconnect-device (QFabric System) on page 1584
show chassis beacon interconnect-device fpc (QFabric System) on page 1585
show chassis beacon node-device (QFabric System) on page 1585
show chassis beacon node-device fpc (QFabric System) on page 1585

Output Fields Table 114 on page 1581 lists the output fields for the **show chassis zones** command. Output fields are listed in the approximate order in which they appear.

Table 114: show chassis zones Output Fields

Field Name	Field Description
Slot	FPC slot number of the device whose content is being displayed. On QFX3500 standalone switches, the number is always **0**.
Beacon State	Status of the beacon state: • Off—The beacon is **OFF**. • On—The beacon is **ON**.
show chassis zones command output fields for MX2020 and MX2010 routers:	
Driving FRU	Field replacable unit (FRU).
Temperature	Temperature of the specified FRU in degrees Celsius and degrees Fahrenheit.
Condition	Condition of the specified FRU. Condition can be **HIGH TEMP**, **WARM TEMP**, **OK**, and **Offline**.
Num Fans Missing	Number of fans or fan trays missing.
Num Fans Failed	Number of fans or fan trays that have failed.
Fan Duty Cycle	Fan duty cycle value.
show chassis zones detail command output fields for MX2020 and MX2010 routers:	
Item	Chassis component: • Information about the chassis, Routing Engines, Control Boards (CBs), Switch Fabric Boards (SFBs), PICs, Flexible PIC Concentrators (FPCs), and Adapter Cards (ADCs).
Measurement	Fan tray speed utilization in percentage.
Status	Status of the specified item. Status can be **OK**, **Absent**, or **Offline**.

Sample Output

show chassis zones interconnect-device (QFabric System)

```
user@switch> show chassis zones interconnect-device interconnect1
Slot             Beacon State
   FPC      0          OFF
```

show chassis zones (MX2010 Router)

```
user@host> show chassis zones
```

```
ZONE 0 Status
    Driving FRU                 FPC 6
    Temperature                 81 degrees C / 177 degrees F
    Condition                   HIGH TEMP
    Num Fans Missing            0
    Num Fans Failed             0
    Fan Duty Cycle              30

ZONE 1 Status
    Driving FRU                 SFB 0 Exhaust-Zone1
    Temperature                 71 degrees C / 159 degrees F
    Condition                   WARM TEMP
    Num Fans Missing            0
    Num Fans Failed             0
    Fan Duty Cycle              30
```

show chassis zones detail (MX2010 Router)

```
user@host > show chassis zones
ZONE 0 Status
Item                    Status                  Measurement
CB 0                    WARM TEMP
CB 1                    WARM TEMP
FPC 0                   HIGH TEMP
FPC 1                   HIGH TEMP
FPC 2                   WARM TEMP
FPC 3                   HIGH TEMP
FPC 4                   HIGH TEMP
FPC 5                   HIGH TEMP
FPC 6                   HIGH TEMP
FPC 7                   HIGH TEMP
FPC 8                   HIGH TEMP
FPC 9                   HIGH TEMP
ADC 0                   WARM TEMP
ADC 1                   WARM TEMP
ADC 2                   WARM TEMP
ADC 3                   WARM TEMP
ADC 4                   WARM TEMP
ADC 5                   WARM TEMP
ADC 6                   WARM TEMP
ADC 7                   WARM TEMP
ADC 8                   WARM TEMP
ADC 9                   WARM TEMP
SFB 0                   WARM TEMP
SFB 1                   WARM TEMP
SFB 2                   WARM TEMP
SFB 3                   Offline
SFB 4                   HIGH TEMP
SFB 5                   WARM TEMP
SFB 6                   HIGH TEMP
SFB 7                   WARM TEMP
Fan Tray 0              OK                      Spinning at 98% fan tray speed
Fan Tray 1              OK                      Spinning at 98% fan tray speed

ZONE 1 Status
Item                    Status                  Measurement
CB 0                    WARM TEMP
CB 1                    WARM TEMP
Routing Engine 0        OK
Routing Engine 1        OK
SFB 0                   WARM TEMP
```



```
SFB 1                WARM TEMP
SFB 2                WARM TEMP
SFB 3                Offline
SFB 4                HIGH TEMP
SFB 5                WARM TEMP
SFB 6                HIGH TEMP
SFB 7                WARM TEMP
SPMB 0               OK
SPMB 1               OK
Fan Tray 2           OK                    Spinning at 64% fan tray speed
Fan Tray 3           OK                    Spinning at 64% fan tray speed
```

show chassis zones (MX2020 Router)

```
user@host> show chassis zones
ZONE 0 Status
    Driving FRU              FPC 0
    Temperature              31 degrees C / 87 degrees F
    Condition                OK
    Num Fans Missing         0
    Num Fans Failed          0
    Fan Duty Cycle           30

ZONE 1 Status
    Driving FRU              FPC 19
    Temperature              32 degrees C / 89 degrees F
    Condition                OK
    Num Fans Missing         0
    Num Fans Failed          0
    Fan Duty Cycle           30
```

show chassis zones detail (MX2020 Router)

```
user@host> show chassis zones detail
ZONE 0 Status
Item                 Status                Measurement
CB 0                 OK
CB 1                 OK
FPC 0                OK
FPC 1                OK
FPC 2                OK
FPC 3                OK
FPC 4                OK
FPC 5                OK
FPC 6                OK
FPC 7                OK
FPC 8                OK
FPC 9                OK
ADC 0                OK
ADC 1                OK
ADC 2                OK
ADC 3                OK
ADC 4                OK
ADC 5                OK
ADC 6                OK
ADC 7                OK
ADC 8                OK
ADC 9                OK
SFB 0                OK
SFB 1                OK
SFB 2                OK
```

```
SFB 3                   OK
SFB 4                   OK
SFB 5                   OK
SFB 6                   OK
SFB 7                   OK
Fan Tray 0              OK                    Spinning at 38% fan tray speed
Fan Tray 1              OK                    Spinning at 37% fan tray speed

ZONE 1 Status
Item                    Status                Measurement
CB 0                    OK
CB 1                    OK
Routing Engine 0        OK
Routing Engine 1        OK
FPC 10                  OK
FPC 11                  OK
FPC 12                  OK
FPC 13                  OK
FPC 14                  OK
FPC 15                  OK
FPC 16                  OK
FPC 17                  OK
FPC 18                  OK
FPC 19                  OK
ADC 10                  OK
ADC 11                  OK
ADC 12                  OK
ADC 13                  OK
ADC 14                  OK
ADC 15                  OK
ADC 16                  OK
ADC 17                  OK
ADC 18                  OK
ADC 19                  OK
SFB 0                   OK
SFB 1                   OK
SFB 2                   OK
SFB 3                   OK
SFB 4                   OK
SFB 5                   OK
SFB 6                   OK
SFB 7                   OK
SPMB 0                  OK
SPMB 1                  OK
Fan Tray 2              OK                    Spinning at 38% fan tray speed
Fan Tray 3              OK                    Spinning at 38% fan tray speed
```

show chassis beacon interconnect-device (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1
Chassis               OFF
CB 0                  OFF
CB 1                  OFF
FC 0 FPC 0            OFF
FC 1 FPC 1            OFF
RC 0 FPC 8            OFF
RC 1 FPC 9            OFF
```


show chassis beacon interconnect-device fpc (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1 fpc 0
FPC 0                ON
```

show chassis beacon node-device (QFabric System)

```
user@switch> show chassis beacon node-device node1
node1               ON
```

show chassis beacon node-device fpc (QFabric System)

```
user@switch> show chassis beacon node-device node1 fpc 0
FPC 0              ON
```

show fib-local-accounting ip

Syntax show fib-local-accounting ip

Release Information Command introduced in Junos OS Release 12.3 for MX Series routers.

Description Display the number of packets that were sent to an anchor MPC due to FIB localization.

Required Privilege Level view

Related Documentation

- fib-remote on page 199
- fib-local on page 198
- Example: Configuring Packet Forwarding Engine FIB Localization on page 194

Sample Output

show fib-local-accounting ip

```
user@host> show fib-local-accounting ip
PFE 0
         fe_addr         packets         bytes
         28                       0                       0
         29                       0                       0
         30                       0                       0
         31                       0                       0
PFE 1
         fe_addr         packets         bytes
         28                       0                       0
         29                       0                       0
         30                       0                       0
         31                       0                       0
```

show ptp clock

Syntax show ptp clock

Release Information Command introduced in Junos OS Release 12.2.
Command introduced in Junos OS Release 12.3 for ACX Series Routers.

Description (ACX Series, MX80, MX240, MX480, and MX960 routers) Display the details of the clock configured on the node.

Options This command has no options.

Required Privilege Level view

Related Documentation

- *IEEE 1588v2 PTP Boundary Clock Overview*
- *IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers*
- Precision Time Protocol Overview on page 143

List of Sample Output
show ptp clock on page 1588
show ptp clock (ACX Series Routers) on page 1589

Output Fields Table 115 on page 1587 lists the output fields for the **show ptp clock** command. Output fields are listed in the approximate order in which they appear.

Table 115: show ptp clock Output Fields

Field Name	Field Description
Slot Number	Number of the FPC or MIC slot.
Two-step Clock	Whether the clock provides time information which is a combination of an event message and a subsequent general message: **True** or **False**.
Clock Identity	Clock identity of the slave or client as defined in IEEE 1588.
Total Ports on Device	Total number of PTP ports on the router.
Clock Class	Attribute of an ordinary or boundary clock that denotes the traceability of the time or frequency distributed by the grandmaster clock.
Clock Accuracy	Indicates the expected accuracy of a clock when it is the grandmaster, or in the event it becomes the grandmaster.
Log Variance	Represents an estimate of the variations of the local clock when it is not synchronized via PTP to another clock.
Clock Priority1	Priority value of the clock. Lower value takes precedence.

Table 115: show ptp clock Output Fields *(continued)*

Field Name	Field Description
Clock Priority2	Prioritize the masters to avoid confusion when the **Clock Priority1** value is the same for different masters in a network.
UTC Offset	Offset between International Atomic Time (TAI) and Coordinated Universal Time (UTC) times. The value is 34 seconds as of January 2012.
Leap59	When **TRUE**, the last minute of the current UTC day has only 59 seconds (instead of the 60 SI seconds).
Leap61	When **TRUE**, the last minute of the current UTC day has 61 seconds (instead of the 60 SI seconds).
Time Traceable	When **TRUE**, the timescale and the UTC offset are traceable to a primary reference.
Frequency Traceable	When **TRUE**, frequency determining the timescale is traceable to a primary reference.
Time Source	Time source external to the Precision Time Protocol (PTP), which provides time and/or frequency as appropriate. The time source is traceable to the international standards laboratories maintaining clocks that form the basis for the International Atomic Time (TAI) and Universal Coordinated Time (UTC) timescales. Examples of these are Global Positioning System (GPS), NTP, and National Institute of Standards and Technology (NIST) timeservers.
Delay Req Sending Time	Interval in seconds between the delay-request messages sent by the slave to the master.
Steps Removed	Number of boundary clocks between the local clock and the foreign master clock.
Slave-only	Set to **TRUE**, when the system is used in ordinary slave clock mode; otherwise, **FALSE**.
Parent Id	EUI-64 clock identifier of the immediate upstream master clock.
GMC Id	EUI-64 clock identifier of the grandmaster clock.
GMC Class	Denotes the grandmaster clock's traceability of the distributed time or frequency.
GMC Accuracy	Indicates the expected accuracy of the grandmaster clock.
GMC Variance	Represents an estimate of the variations of the grandmaster clock.
GMC Priority1	**Priority1-value** of the grandmaster clock.
GMC Priority2	**Priority2-value** of the grandmaster clock.

Sample Output

show ptp clock

```
user@host> run show ptp clock
Clock Details:

Slot Number          : 7
Default Data:
```

```
Two-step Clock        : FALSE                     Clock Identity :
00:05:85:ff:fe:73:ef:d0
Total Ports on Device : 0                         Clock Class    : 255
Clock Accuracy        : 49                        Log Variance   : -12944
Clock Priority1       : 128                       Clock Priority2: 128
UTC Offset            : 33                        Leap59         : FALSE
Leap61                : FALSE                     Time Traceable  : FALSE
Frequency Traceable   : FALSE                     Time master    : 0
Delay Req Sending Time: 0                         Steps Removed  : 1
Slave-only            : NA
Parent Data:
Parent Id             : 00:18:0b:ff:ff:20:01:62
GMC Id                : 00:18:0b:ff:ff:20:01:62  GMC Class        : 52
GMC Accuracy          : 254                      GMC Variance     : 11952
GMC Priority1         : 0                        GMC Priority2    : 0
Global Data:
UTC Offset            : 34                       Leap-59          : FALSE
Leap-61               : FALSE                    Time traceable    : FALSE
Freq Traceable        : FALSE                    Time Scale       : FALSE
Time master           : 160
```

show ptp clock (ACX Series Routers)

```
user@host> run show ptp clock
Clock Details:
Slot Number           : 0
Default Data:
Two-step Clock        : FALSE                     Clock Identity :
84:18:88:ff:fe:c0:7a:00
Total Ports on Device : 0                         Clock Class    : 255
Clock Accuracy        : 34                        Log Variance   : 15353
Clock Priority1       : 128                       Clock Priority2: 128
UTC Offset            : 0                         Leap59         : FALSE
Leap61                : FALSE                     Time Traceable : FALSE
Frequency Traceable   : FALSE                     Time Source    : 0
Delay Req Sending Time: 0                         Steps Removed  : 0
Slave-only            : NA
Parent Data:
Parent Id             : 00:00:64:ff:fe:01:01:02
GMC Id                : 00:00:64:ff:fe:01:01:02  GMC Class        : 80
GMC Accuracy          : 35                       GMC Variance     : 0
GMC Priority1         : 128                      GMC Priority2    : 128
Global Data:
UTC Offset            : 0                        Leap-59          : FALSE
Leap-61               : FALSE                    Time tracable    : FALSE
Freq Traceable        : FALSE                    Time Scale       : FALSE
Time source           : 16
```


show ptp hybrid

Syntax

show ptp hybrid
<config | status>

Release Information

Command introduced in Junos OS Release 12.2R2.

Description

Display the current configuration and current operation mode of the slave.

Options

config—Display the PTP source to Synchronous Ethernet interface mappings.

status—Display the current hybrid mode operational status.

Required Privilege Level

View

Related Documentation

- Understanding Hybrid Mode on page 164

Output Fields

Table 116 on page 1590 lists the output fields for the **show ptp hybrid** command. Output fields are listed in the approximate order in which they appear.

Table 116: show ptp hybrid Output Fields

Field Name	Field Description
ptp source	Displays the IP address of the PTP source.
synce source	Displays the interface name of the Synchronous Ethernet source through which the PTP source is traceable.
Configured Mode	Displays the current configured mode of the router as **Hybrid**.
Operating Mode	Displays the current operation mode: **Hybrid** or **None**.
PTP Reference	Displays the IP address and the interface name of the PTP reference clock.
Synchronous Ethernet Reference	Displays the interface name of the Synchronous Ethernet reference clock.
Lock state	Displays the current lock state of the router: **Locked**, **Initializing**, or **Acquiring**.
Lock state description	Displays the description for the current lock state of the router: • **Initializing**—Hybrid mode is being initialized. • **Acquiring Frequency**—Synchronous Ethernet source identified for frequency synchronization, acquiring frequency-related data from master clock. • **Frequency Locked, Acquiring Phase**—Frequency locked from the Synchronous Ethernet source, acquiring phase-related data from master clock. • **Frequency and Phase Locked**—Slave clock is frequency and phase synchronized with master clock.

Sample Output

show ptp hybrid config

```
user@host> show ptp hybrid config
ptp source          synce source
100.1.1.2              ge-1/1/2
```

show ptp hybrid status

```
user@host> show ptp hybrid status
Hybrid Mode Status:
Configured Mode                : Hybrid
Operating  Mode                : Hybrid
PTP Reference                  : 100.1.1.2, ge-1/0/0.0
Synchronous Ethernet Reference : ge-1/1/2
Lock state                     : Locked
Lock state description         : Frequency and Phase Locked
```

show ptp lock-status

Syntax
show ptp lock-status

Release Information
Command introduced in Junos OS Release 12.2.

Description
(ACX Series, MX80, MX240, MX480, and MX960 routers) Display information about the lock status of the slave. The output verifies whether the slave is aligned to the grandmaster (master clock) or not.

Options
detail—Display detailed information about the lock status of the slave.

Required Privilege Level
view

Related Documentation
- *IEEE 1588v2 PTP Boundary Clock Overview*
- *IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers*
- Precision Time Protocol Overview on page 143

List of Sample Output
show ptp lock-status on page 1593
show ptp lock-status (ACX Series) on page 1593
show ptp lock-status detail (ACX Series) on page 1593

Output Fields
Table 117 on page 1592 lists the output fields for the **show ptp lock-status** command. Output fields are listed in the approximate order in which they appear.

Table 117: show ptp lock-status Output Fields

Field Name	Field Description
Lock State	State of the slave clock with respect to its master clock: • Freerun • Holdover • Phase Aligned • Acquiring • Initializing • Freq locked
Phase offset	Time offset information of a slave clock with respect to its master clock. Precision of this time offset is 1 nanosecond.
Selected Master Details	Details include the following: • **Upstream Master address**—The address of the remote master from which the salve acquires the clock. • **Slave interface**—The slave interface on this router corresponding to the Master above.

Sample Output

show ptp lock-status

```
user@host> run show ptp lock-status
Lock Status:

Lock State    : 5 (PHASE ALIGNED)
Phase offset  : 0.000000001 sec
```

show ptp lock-status (ACX Series)

```
user@host> show ptp lock-status
Lock Status:

Lock State    : 1 (FREERUN)
Phase offset  : 0.000000869 sec
```

show ptp lock-status detail (ACX Series)

```
user@host> show ptp lock-status detail
Lock Status:

Lock State    : 5 (PHASE ALIGNED)
Phase offset  : 0.000000030 sec

Selected Master Details:
Upstream Master address    : 13.13.13.1
Slave interface            : ge-0/1/5.0
```


show ptp master

Syntax
show ptp master
<brief |detail | interface>

Release Information Command introduced in Junos OS Release 12.2.

Description (MX80, MX240, MX480, and MX960 routers) Display information about the configured master and the status of the master.

Options **brief**—Display information about the master in brief.

detail—Display information about the master in detail.

interface—Display information about the configured interface of the master.

Required Privilege Level View

Related Documentation
- Precision Time Protocol Overview on page 143

Output Fields Table 118 on page 1594 lists the output fields for the **show ptp master** command. Output fields are listed in the approximate order in which they appear.

Table 118: show ptp master Output Fields

Field Name	Field Description
Interface	Name of the interface configured for Precision Time Protocol (PTP) on the master.
Status	Status of the Precision Time Protocol master: • **Master** or **Slave** • **Active** or **Inactive** • **Initializing** or **Down**
Local IP	IP address of the configured master clock.
Status (Local IP Address Status)	Status of the local IP address of the interface: • **Configured** or **Not configured** • **Master** or **Slave** • **Active** or **Inactive**
Total Remote Slaves	Number of remote slaves.
Slave IP	IP address of the slave.

Table 118: show ptp master Output Fields *(continued)*

Field Name	Field Description
Status (Slave IP Address Status)	Status of the IP address of the slave: • **Configured** or **Not configured** • **Master** or **Slave** • **Active** or **Inactive** or **Ready**

Sample Output

show ptp master

```
user@host> run show ptp master brief
PTP Master Interface Configured:

Master Interface           Status
ge-7/0/2.0                 Master, Active
```

show ptp master detail

```
user@host> run show ptp master detail
PTP Master Interface Details:
Interface   : ge-7/0/2.0
Status      : Master, Active
Clock Info :
    Local IP: 10.0.0.1               Status: Configured, Master, Active
    Total Remote Slaves: 0
        Slave IP: 10.0.0.2           Status: Configured, Slave, Active
```

show ptp interface ge-7/0/2.0

```
user@host> run show ptp master interface ge-7/0/2.0
PTP Master Interface Configured:

Master Interface           Status
ge-7/0/2.0                 Master, Active
```


show ptp port

Syntax

show ptp port
<brief | detail>

Release Information Command introduced in Junos OS Release 12.2.

Description (MX80, MX240, MX480, and MX960 routers) Display information about the number of ports created according to the configuration. For each unique local IP address, one Precision Time Protocol port is created.

Options

brief—Display information about the PTP port in brief.

detail—Display information about the PTP port in detail.

Required Privilege Level View

Related Documentation

- Precision Time Protocol Overview on page 143

Output Fields Table 119 on page 1596 lists the output fields for the **show ptp port** command. Output fields are listed in the approximate order in which they appear.

Table 119: show ptp port Output Fields

Field Name	Field Description
Local IP	IP address of the interface acting as the slave.
Remote IP	IP address of the remote node.
Clock Stream	Unique index for each session created.
Clock Identity	IP address of the slave.
Port State	Status of the port: **PTP listening** or **PTP initializing**.
Delay Req Interval	Interval in seconds between the delay request messages sent by the slave to the master.
Announce Interval	Logarithmic mean interval for the announce messages to be sent by the master.
Announce Timeout	Number of times the announce interval message has to pass between the slave and the master without receipt of an announce message.
Sync Interval	Logarithmic mean interval for sync interval messages to be sent by the master.
Delay Mechanism	Type of delay mechanism used.
Port Number	PTP port number.

Table 119: show ptp port Output Fields *(continued)*

Field Name	Field Description
Operating Mode	Clock mode of the node.
Master Clock ID	Unique clock-identity of the master.
Previous Announce Messages	Previous announce messages.
Current Announce Message	Current announce messages.

Sample Output

show ptp port brief

```
user@host> run show ptp port brief
PTP port-data:
Local IP            : 10.0.0.1       Remote IP          : 10.0.0.2
Clock Stream        : 1             Clock Identity     : 00:05:85:ff:fe:73:ef:d0
Port State          : Listening      Delay Req Interval: -4
Announce Interval : 1               Announce Timeout  : 3
Sync Interval       : -6             Delay Mechanism   : End-to-end
Port Number         : 2              Operating Mode    : Master only

Local IP            : 10.10.1.10     Remote IP          : 10.10.1.2
Clock Stream        : 0             Clock Identity     : 00:05:85:ff:fe:73:ef:d0
Port State          : Listening      Delay Req Interval: -4
Announce Interval : 1               Announce Timeout  : 3
Sync Interval       : -6             Delay Mechanism   : End-to-end
Port Number         : 1              Operating Mode    : BMC Mode
```

show ptp port detail

```
user@host> run show ptp port detail
PTP port-data:
Local IP            : 10.0.0.1       Remote IP          : 10.0.0.2
Clock Stream        : 1             Clock Identity     : 00:05:85:ff:fe:73:ef:d0
Port State          : Listening      Delay Req Interval: -4
Announce Interval : 1               Announce Timeout  : 3
Sync Interval       : -6             Delay Mechanism   : End-to-end
Port Number         : 2              Operating Mode    : Master only

Local IP            : 10.10.1.10     Remote IP          : 10.10.1.2
Clock Stream        : 0             Clock Identity     : 00:05:85:ff:fe:73:ef:d0
Port State          : Listening      Delay Req Interval: -4
Announce Interval : 1               Announce Timeout  : 3
Sync Interval       : -6             Delay Mechanism   : End-to-end
Port Number         : 1              Operating Mode    : BMC Mode

Foreign Master Clock Details:
Master Clock Id              : 00:18:0b:ff:ff:20:01:62
Previous Announce Messages    : 8
Current Announce Messages     : 1
```

show ptp slave

Syntax

show ptp slave
<brief | detail | interface>

Release Information

Command introduced in Junos OS Release 12.2.

Description

(MX80, MX240, MX480, and MX960 routers) Display information about the configured slave and the status of the slave.

Options

brief—Display information about the slave in detail.

detail—Display information about the slave in detail.

interface—Display information about the configured interface of the slave.

Required Privilege Level

View

Related Documentation

- Precision Time Protocol Overview on page 143

Output Fields

Table 120 on page 1598 lists the output fields for the **show ptp slave** command. Output fields are listed in the approximate order in which they appear.

Table 120: show ptp slave Output Fields

Field Name	Field Description
Interface	Name of the interface configured for Precision Time Protocol.
Status	Status of the Precision Time Protocol slave: • **Master** or **Slave** • **Active** or **Inactive** • **Initializing** or **Down**
Interface	Interface configured on the slave.
Local IP	IP address of the local interface.
Status (Local IP address Status)	Status of the IP address of the interface acting as the slave: • **Configured** or **Unconfigured** • **Master** or **Slave** • **Active** or **Inactive** or **Ready**
Total Remote Masters	Number of remote masters.
Remote Master	IP address of the remote node.

Table 120: show ptp slave Output Fields *(continued)*

Field Name	Field Description
Status (Slave IP Address Status)	Status of the IP address of the master: • **Configured** or **Unconfigured** • **Master** or **Slave** • **Active** or **Inactive**

Sample Output

show ptp slave

```
user@host> run show ptp slave
PTP Slave Interfaces Configured:

Slave Interface             Status
ge-7/0/0.0                  Slave, Active
```

show ptp slave detail

```
user@host> run show ptp slave detail
PTP Slave Interface Details:

Interface        : ge-7/0/0.0
Status           : Slave, Active
Clock Info
    Local IP : 10.10.1.10              Status: Configured, Slave, Active
    Total Remote Masters: 0
        Remote Master: 10.10.1.2       Status: Configured, Master, Active
```

show synchronous-ethernet esmc statistics

Syntax

show synchronous-ethernet esmc statistics
<brief interface *interface-name*>
<detail interface *interface-name*>
< interface *interface-name*>
< interface *interface-name* (brief | detail)>

Release Information

Command introduced in Junos OS Release 11.2R4 for MX Series 3D Universal Edge Routers.

Description

(MX5, MX10, MX40, MX80, MX80-T, MX240, MX480, MX960, MX2010, and MX2020 routers only) Display the Synchronous Ethernet ESMC statistics.

Required Privilege Level

maintenance

Related Documentation

- Synchronous Ethernet Overview on page 133
- Configuring an External Clock Synchronization Interface for MX Series Routers on page 309
- **request chassis synchronization mode on page 670**
- **show synchronous-ethernet global-information on page 1604**
- **show synchronous-ethernet esmc transmit on page 1602**

List of Sample Output

show synchronous-ethernet esmc statistics detail on page 1601

Output Fields

Table 121 on page 1600 lists the output fields for the**show synchronous-ethernet esmc statistics** command. Output fields are listed in the approximate order in which they appear.

Table 121: show synchronous-ethernet esmc statistics Output Fields

Field Name	Field Description
Interface Name	**interface-slot/pic/port**—Displays the name of the interface for which the ESMC statistics are displayed.
Transmit Count	**number**—Displays the number of ESMC packets transmitted.
Receive Count	**number**—Displays the number of ESMC packets received.

Sample Output

```
user@host# show synchronous-ethernet esmc statistics
ESMC statistics:
Interface Name       Transmit Count       Receive Count
ge-1/0/4             3540                 0
ge-1/0/2             3539                 0
ge-1/2/4             3540                 0
```

show synchronous-ethernet esmc statistics detail

```
user@host> show synchronous-ethernet esmc statistics detail
ESMC Statistics:

Interface Name  :  xe-2/0/10
Transmit Count  :  40908            Receive Count        : 40534
Total Drop Count:  336              Ineligible Drop Count: 0
Adjacency Count :  4
```

show synchronous-ethernet esmc transmit

Syntax

show synchronous-ethernet esmc transmit
<brief interface *interface-name*>
<detail interface *interface-name*>
< interface *interface-name*>
< interface *interface-name* (brief | detail)>

Release Information Command introduced in Junos OS Release 11.2R4 for MX80 3D Universal Edge Routers.

Description (MX5, MX10, MX40, MX80, MX80-T, MX240, MX480, MX960, MX2010, and MX2020 routers only) Display the Synchronous Ethernet ESMC transmit interface details.

Required Privilege Level maintenance

Related Documentation

- Synchronous Ethernet Overview on page 133
- Configuring an External Clock Synchronization Interface for MX Series Routers on page 309
- **request chassis synchronization mode on page 670**
- **show synchronous-ethernet global-information on page 1604**
- **show synchronous-ethernet esmc statistics on page 1600**

List of Sample Output **show synchronous-ethernet esmc transmit on page 1602**

Output Fields Table 122 on page 1602 lists the output fields for the **show synchronous-ethernet esmc transmit detail** command. Output fields are listed in the approximate order in which they appear.

Table 122: show synchronous-ethernet esmc transmit detail Output Fields

Field Name	Field Description
Interface name	**interface-slot/pic/port**—Displays the name of the interface for which the ESMC transmit details are displayed.
Status	**string**—Displays the ESMC transmit interface status details.

Sample Output

```
user@host# show synchronous-ethernet esmc transmit detail
ESMC Transmit interface details:
    Interface name: ge-1/0/4         Status: ESMC Tx (QL SSU-A/SSM 0x4)
    Interface name: ge-1/0/2         Status: ESMC Tx (QL DNU/SSM 0xf)
    Interface name: ge-1/2/4         Status: ESMC Tx (QL SSU-A/SSM 0x4)
```

show synchronous-ethernet esmc transmit

```
user@host> show synchronous-ethernet esmc transmit
```



```
ESMC Transmit interfaces:
    xe-2/0/10
```

show synchronous-ethernet global-information

Syntax

show synchronous-ethernet global-information
<brief>

Release Information

Command introduced in Junos OS Release 11.2R4 for MX80-T, MX5, MX10, MX40, MX240, MX480, and MX960 routers.

Description

(MX5, MX10, MX40, MX80, MX80-T, MX240, MX480, and MX960 routers only) Display information about the global configuration for Synchronous Ethernet chassis synchronization.

Required Privilege Level

maintenance

Related Documentation

- Synchronous Ethernet Overview on page 133
- Configuring an External Clock Synchronization Interface for MX Series Routers on page 309
- **request chassis synchronization mode on page 670**
- **show synchronous-ethernet esmc statistics on page 1600**
- **show synchronous-ethernet esmc transmit on page 1602**

Output Fields

Table 123 on page 1604 lists the output fields for the **show synchronous-ethernet global-information** command. Output fields are listed in the approximate order in which they appear.

Table 123: show synchronous-ethernet global-information Output Fields

Field Name	Field Description
Network option	**(option-1(EEC1) | option-2(EEC2))**—Displays the network option configuration, either option-1(EEC1) or option-2(EEC2).
Clock mode	**(free-run | auto-select)**—Displays the configured mode of operation. The clock source can be either from the free-run local oscillator or from an external qualified clock. The default is auto-select mode.
QL mode	**(enable | disable)**—Displays the configured quality level mode configuration. The default is disable.
Switchover mode	**(revertive | non-revertive)**—Displays the configured synchronization clock switching mode. The default mode is revertive.
Config change holdover	**seconds**—Displays the time interval to wait before selecting the new clock source during a configuration change. The default value is 30 seconds.
Switchover holdover	**seconds**—Displays the time interval to wait before selecting the new clock source during switchover. The default value is 30 seconds.
Reboot holdover	**seconds**—Displays the time interval to wait before selecting the new clock source during reboot. The default value is 120 seconds.

Sample Output

```
user@host# show synchronous-ethernet global-information
Global Configuration:

Network option         : option-1(EEC1)
Clock mode             : Auto-select
QL mode                : Disabled
Switchover mode        : Revertive
Config change holdover : 15  seconds
Switchover holdover    : 30  seconds
Reboot holdover        : 120 seconds
```

PART 4

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