Connect Router to the Network

Note The images in this chapter are only for representation purposes, unless specified otherwise. The chassis' actual appearance and size may vary.

Connecting a Console to the Router

Before you create a network management connection for the router or connect the router to the network, you must create a local management connection through a console terminal and configure an IP address for the router. The router can be accessed using remote management protocols, such as SSH and Telnet. By default, SSH is included in the software image. But telnet is not part of the software image. You must manually install the telnet optional package to use it.

You also can use the console to perform the following functions, each of which can be performed through the management interface after you make that connection:

- configure the router using the command-line interface (CLI)
- monitor network statistics and errors
- configure Simple Network Management Protocol (SNMP) agent parameters
- initiate software download updates via console

You make this local management connection between the asynchronous serial port on a Route Processor card and a console device capable of asynchronous transmission. Typically, you can use a computer terminal as the console device. On the Route Processor cards, you use the console serial port.

Note Before you can connect the console port to a computer terminal, ensure that the computer terminal supports VT100 terminal emulation. The terminal emulation software makes communication between the router and computer possible during setup and configuration.

Before you begin

- The router must be fully installed in its rack. The router must be connected to a power source and grounded.
- The necessary cabling for the console, management, and network connections must be available.
  - An RJ45 rollover cable and a DB9F/RJ45 adapter.
  - Network cabling should already be routed to the location of the installed router.

Procedure

Step 1 Configure the console device to match the following default port characteristics:

- 115200 baud
- 8 data bits
- 1 stop bit
- No parity

Step 2 Connect and RJ45 rollover cable to a terminal, PC terminal emulator, or terminal server.

The RJ45 rollover cable is not part of the accessory kit.

Step 3 Route the RJ45 rollover cable as appropriate and connect the cable to the console port on the chassis.

If the console or modem cannot use an RJ45 connection, use the DB9F/RJ45F PC terminal adapter. Alternatively, you can use an RJ45/DSUB F/F or RJ45/DSUB R/P adapter, but you must provide those adapters.

What to do next

You are ready to create the initial router configuration.

Connect the Management Interface

The Route Processor management port (MGMT ETH) provides out-of-band management, which lets you to use the command-line interface (CLI) to manage the router by its IP address. This port uses a 10/100/1000 Ethernet connection with an RJ-45 interface.

Note In a dual Route Processor router, you can ensure that the active Route Processor card is always connected to the network by connecting the management interface on both Route Processor cards to the network. That is, you can perform this task for each Route Processor card. When the Route Processor card is active, the router automatically has a management interface that is running and accessible from the network.

Caution To prevent an IP address conflict, do not connect the MGMT 100/1000 Ethernet port until the initial configuration is complete.

Before you begin

You must have completed the initial router configuration.

Procedure

Step 1 Connect a modular, RJ-45, UTP cable to the MGMT ETH port on the Route Processor card.

Step 2 Route the cable through the central slot in the cable management system.

Step 3 Connect the other end of the cable to a 100/1000 Ethernet port on a network device.

What to do next

You are ready to connect the interface ports to the network.

Transceivers, Connectors, and Cables

Transceiver and Cable Specifications

To determine which transceivers and cables are supported by this router, see Cisco Transceiver Modules Compatibility Information.

To see the transceiver specifications and installation information, see Cisco Transceiver Modules Install and Upgrade Guides.

RJ-45 Connectors

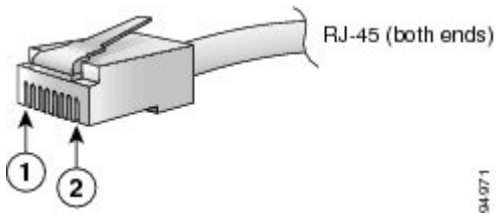
The RJ-45 connector connects Category 3, Category 5, Category 5e, Category 6, or Category 6A foil twisted-pair or unshielded twisted-pair cable from the external network to the following module interface connectors:

- Router chassis
  - CONSOLE port
  - MGMT ETH port

Caution To comply with GR-1089 intrabuilding, lightning immunity requirements, you must use a foil twisted-pair (FTP) cable that is properly grounded at both ends.

The following figure shows the RJ-45 connector.

Figure 1: RJ-45 Connector



1	Pin 1	2	Pin 8

Install and Remove SFP or SFP+ Modules

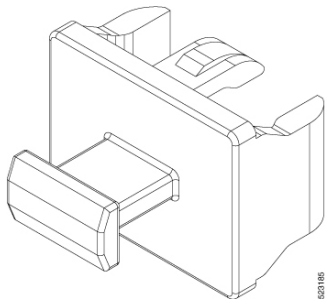
Before you remove or install an SFP or SFP+ module, read the installation information in this section.

Warning **Statement 1051—**Laser Radiation

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Caution Protect the line card by inserting a clean SFP/SFP+ module cage cover, which is shown in the figure below, into the optical module cage when there is no SFP or SFP+ module installed.

Figure 2: SFP/SFP+ Module Cage Cover



Caution Protect the SFP or SFP+ modules by inserting clean dust covers into them after the cables are removed. Be sure to clean the optic surfaces of the fiber cables before you plug them back into the optical ports of another module. Avoid getting dust and other contaminants into the optical ports of your SFP or SFP+ modules, because the optics do not work correctly when obstructed by dust.

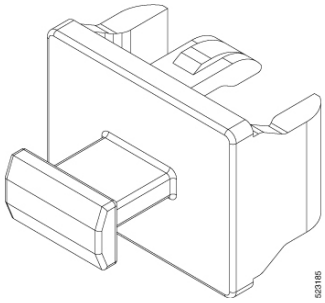
Caution We strongly recommended that you do not install or remove the SFP or SFP+ module with fiber-optic cables that are attached to it because of the potential of damaging the cable, the cable connector, or the optical interfaces in the module. Disconnect all cables before removing or installing an SFP or SFP+ module. Removing and inserting a module can shorten its useful life, so you should not remove and insert modules any more than is absolutely necessary.

Note When installing an SFP or SFP+ module, you should hear a click as the triangular pin on the bottom of the module snaps into the hole in the receptacle. The click indicates that the module is correctly seated and secured in the receptacle. Verify that the modules are seated and secured in their assigned receptacles on the line card by firmly pushing on each SFP or SFP+ module.

Bale Clasp SFP or SFP+ Module

The bale clasp SFP or SFP+ module has a clasp that you use to remove or install the module (see the figure below).

Figure 3: Bale Clasp SFP or SFP+ Module



Installing the Transceiver Module

Warning **Statement 1055—**Class 1/1M Laser

Invisible laser radiation is present. Do not expose to users of telescopic optics. This applies to Class 1/1M laser products.

Warning **Statement 1051—**Laser Radiation

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Warning **Statement 1079—**Hot Surface

This icon is a hot surface warning. To avoid personal injury, do not touch without proper protection.

Caution The transceiver module is a static-sensitive device. Always use an ESD wrist strap or similar individual grounding device when handling transceiver modules or coming into contact with system modules.

Caution Protect the transceiver ports by inserting clean dust caps (8000-QSFP-DCAP) into any ports not in use. Be sure to clean the optic surfaces of the fiber cables before you plug them back into the optical ports of another module. Use dust caps for all the open ports on the chassis.

The router ships with dust caps plugged in. We highly recommend you to keep the dust caps plugged in until you are ready to plug an optic.

The dust caps protect the ports from possible EMI interference and also avoid contamination due to dust collection. To meet the EMI interference requirements, you must use the metal dust caps when the ports are not in use by optical modules.

The QSFP transceiver module has a pull-tab latch. To install a transceiver module, follow these steps:

Procedure

Step 1 Attach an ESD wrist strap to yourself and a properly grounded point on the chassis or the rack.

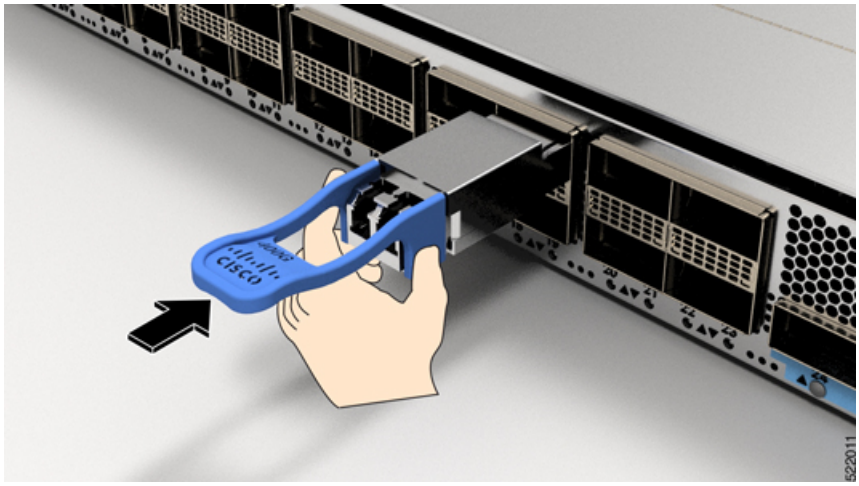
Step 2 Remove the transceiver module from its protective packaging.

Step 3 Check the label on the transceiver module body to verify that you have the correct model for your network. Do not remove the dust plug until you're ready to attach the network interface cable. Dust plug is not shown in the images.

Step 4 Hold the transceiver by the pull-tab so that the identifier label is on the top.

Step 5 Align the transceiver module in front of the module's transceiver socket opening and carefully slide the transceiver into the socket until the transceiver contact with the socket electrical connector.

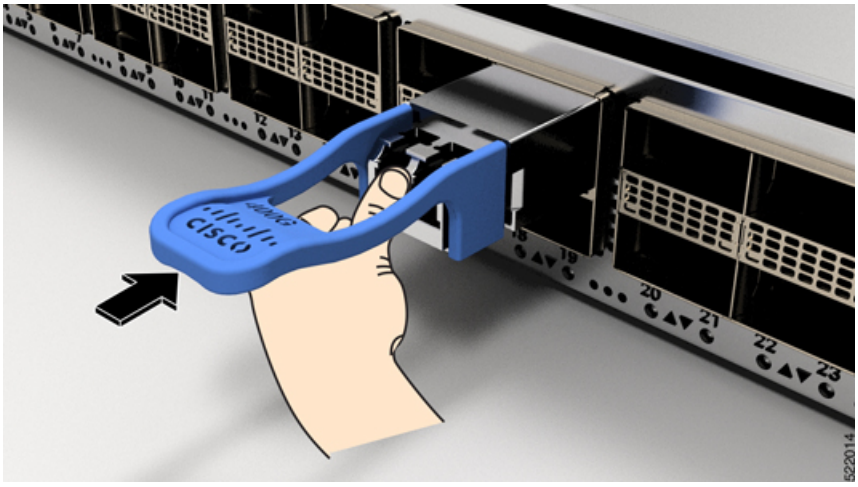
Figure 4: Installing the QSFP Transceiver Module



Step 6 Press firmly on the front of the transceiver module with your thumb to fully seat the transceiver in the module's transceiver socket (see the below figure).

Caution If the latch isn't fully engaged, you might accidentally disconnect the transceiver module.

Figure 5: Seating the QSFP Transceiver Module



Remove a Bale Clasp SFP or SFP+ Module

To remove this type of SFP or SFP+ module, follow these steps:

Procedure

Step 1 Attach an ESD-preventive wrist or ankle strap and follow its instructions for use.

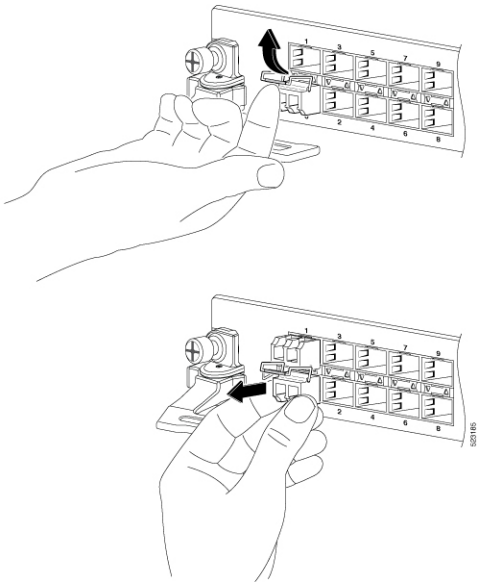
Step 2 Disconnect and remove all interface cables from the ports; note the current connections of the cables to the ports on the line card.

Step 3 Open the bale clasp on the SFP module with your index finger, as shown in the figure below. If the bale clasp is obstructed and you cannot use your index finger to open it, use a small flat-blade screwdriver or other long, narrow instrument to open the bale clasp.

Step 4 Grasp the SFP module between your thumb and index finger and carefully remove it from the port, as shown in the figure below.

Note This action must be performed during your first instance. After all the ports are populated, this may not be possible.

Figure 6: Removing a Bale Clasp SFP or SFP+ Module



Step 5 Place the removed SFP module on an antistatic mat, or immediately place it in a static shielding bag if you plan to return it to the factory.

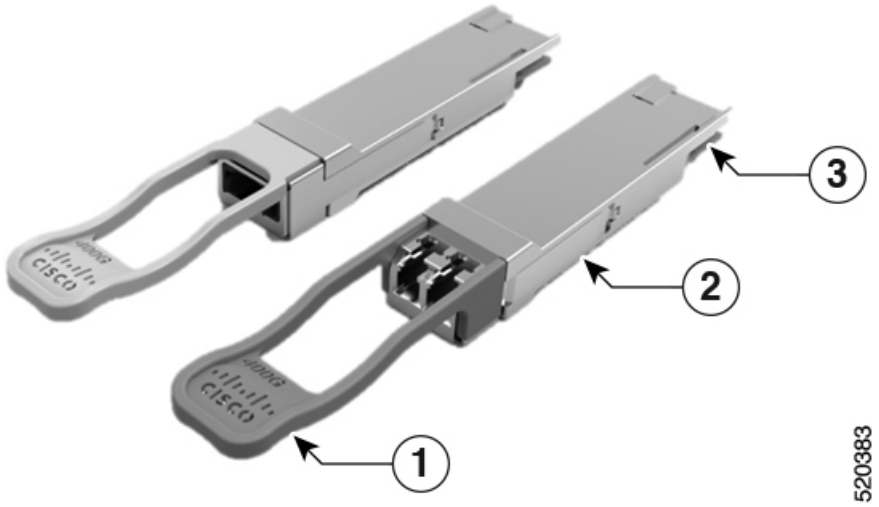
Step 6 Protect your line card by inserting a clean SFP module cage covers into the optical module cage when there is no SFP module installed.

Install and Remove QSFP Transceiver Modules

This section provides the installation, cabling, and removal instructions for the Quad Small Form-Factor Pluggable transceiver modules. Refer to the *Cisco Optical Transceiver Handling Guide* for additional details on optical transceivers.

The following figure shows a 400-Gigabit QSFP-DD optical transceiver.

Figure 7: 400-Gigabit QSFP-DD Transceiver Module



1	Pull-tab	2	QSFP-DD transceiver body
3	Electrical connection to the module circuitry		

Warning

Statement 1079—Hot Surface

This icon is a hot surface warning. To avoid personal injury, do not touch without proper protection.

Required Tools and Equipment

You need these tools to install the transceiver modules:

- Wrist strap or other personal grounding device to prevent ESD occurrences.
- Antistatic mat or antistatic foam to set the transceiver on.
- Fiber-optic end-face cleaning tools and inspection equipment.

Installing the Transceiver Module

Warning **Statement 1055—**Class 1/1M Laser

Invisible laser radiation is present. Do not expose to users of telescopic optics. This applies to Class 1/1M laser products.

Warning **Statement 1051—**Laser Radiation

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Warning **Statement 1079—**Hot Surface

This icon is a hot surface warning. To avoid personal injury, do not touch without proper protection.

Caution The transceiver module is a static-sensitive device. Always use an ESD wrist strap or similar individual grounding device when handling transceiver modules or coming into contact with system modules.

Caution Protect the transceiver ports by inserting clean dust caps (8000-QSFP-DCAP) into any ports not in use. Be sure to clean the optic surfaces of the fiber cables before you plug them back into the optical ports of another module. Use dust caps for all the open ports on the chassis.

The router ships with dust caps plugged in. We highly recommend you to keep the dust caps plugged in until you are ready to plug an optic.

The dust caps protect the ports from possible EMI interference and also avoid contamination due to dust collection. To meet the EMI interference requirements, you must use the metal dust caps when the ports are not in use by optical modules.

The QSFP transceiver module has a pull-tab latch. To install a transceiver module, follow these steps:

Procedure

Step 1 Attach an ESD wrist strap to yourself and a properly grounded point on the chassis or the rack.

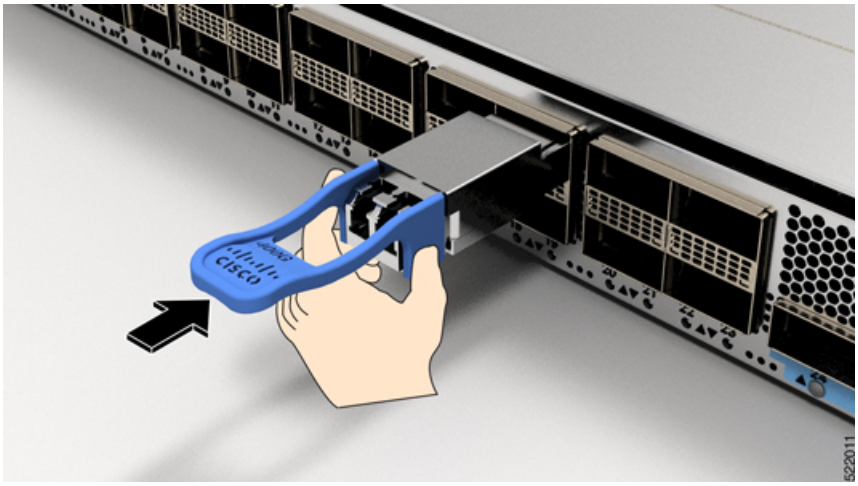
Step 2 Remove the transceiver module from its protective packaging.

Step 3 Check the label on the transceiver module body to verify that you have the correct model for your network. Do not remove the dust plug until you're ready to attach the network interface cable. Dust plug is not shown in the images.

Step 4 Hold the transceiver by the pull-tab so that the identifier label is on the top.

Step 5 Align the transceiver module in front of the module's transceiver socket opening and carefully slide the transceiver into the socket until the transceiver contact with the socket electrical connector.

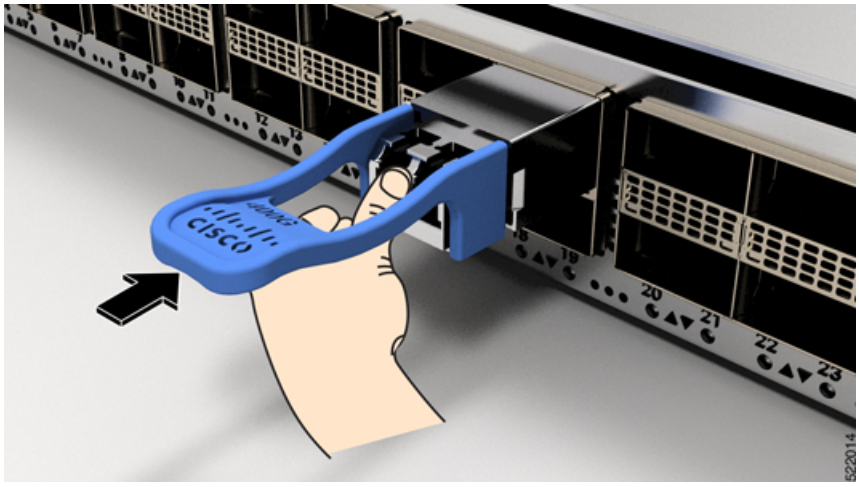
Figure 8: Installing the QSFP Transceiver Module



Step 6 Press firmly on the front of the transceiver module with your thumb to fully seat the transceiver in the module's transceiver socket (see the below figure).

Caution If the latch isn't fully engaged, you might accidentally disconnect the transceiver module.

Figure 9: Seating the QSFP Transceiver Module



Attach the Optical Network Cable

Before you begin

Before you remove the dust plugs and make any optical connections, follow these guidelines:

- Keep the protective dust plugs installed in the unplugged fiber-optic cable connectors and in the transceiver optical bores until you are ready to make a connection.
- Inspect and clean the optical connector end faces just before you make any connections.
- Grasp the optical connector only by the housing to plug or unplug a fiber-optic cable.

Note The transceiver modules and fiber connectors are keyed to prevent incorrect insertion.

Note The multiple-fiber push-on (MPO) connectors on the optical transceivers support network interface cables with either physical contact (PC) or ultra-physical contact (UPC) flat polished face types. The MPO connectors on the optical transceivers do not support network interface cables with an angle-polished contact (APC) face type.

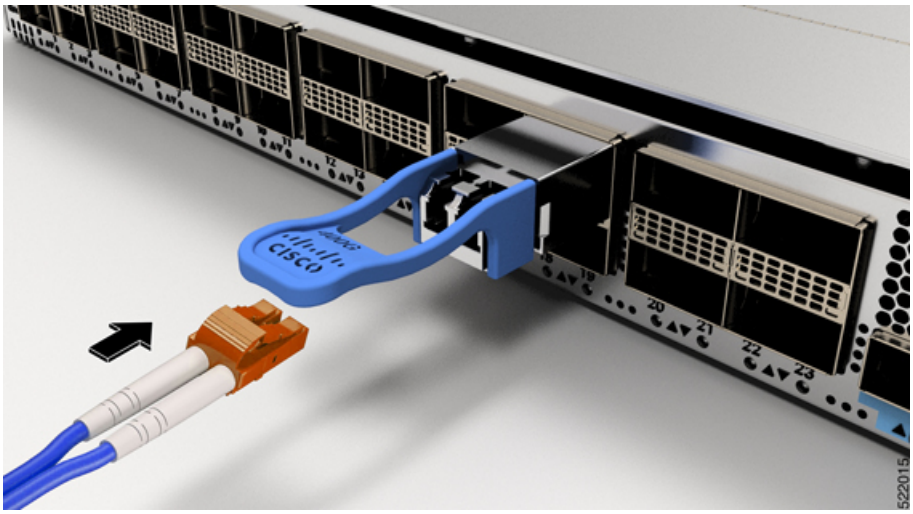
Note Inspect the MPO connector for the correct cable type, cleanliness, and any damage. For complete information on inspecting and cleaning fiber-optic connections, see the *Inspection and Cleaning Procedures for Fiber-Optic Connections* document.

Procedure

Step 1 Remove the dust plugs from the optical network interface cable MPO connectors and from the transceiver module optical bores. Save the dust plugs for future use.

Step 2 Attach the network interface cable MPO connectors immediately to the transceiver module.

Figure 10: Cabling a Transceiver Module



Removing the Transceiver Module

Warning **Statement 1055—**Class 1/1M Laser

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Warning **Statement 1051—**Laser Radiation

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Warning **Statement 1079—**Hot Surface

This icon is a hot surface warning. To avoid personal injury, do not touch without proper protection.

Caution The transceiver module is a static-sensitive device. Always use an ESD wrist strap or similar individual grounding device when handling transceiver modules or coming into contact with modules.

Caution Protect the transceiver ports by inserting clean dust caps (8000-QSFP-DCAP) into any ports not in use. Be sure to clean the optic surfaces of the fiber cables before you plug them back into the optical ports of another module. Use dust caps for all the open ports on the chassis.

The router ships with dust caps plugged in. We highly recommend you to keep the dust caps plugged in until you are ready to plug an optic.

The dust caps protect the ports from possible EMI interference and also avoid contamination due to dust collection. To meet the EMI interference requirements, you must use the metal dust caps when the ports are not in use by optical modules.

To remove a transceiver module, follow these steps:

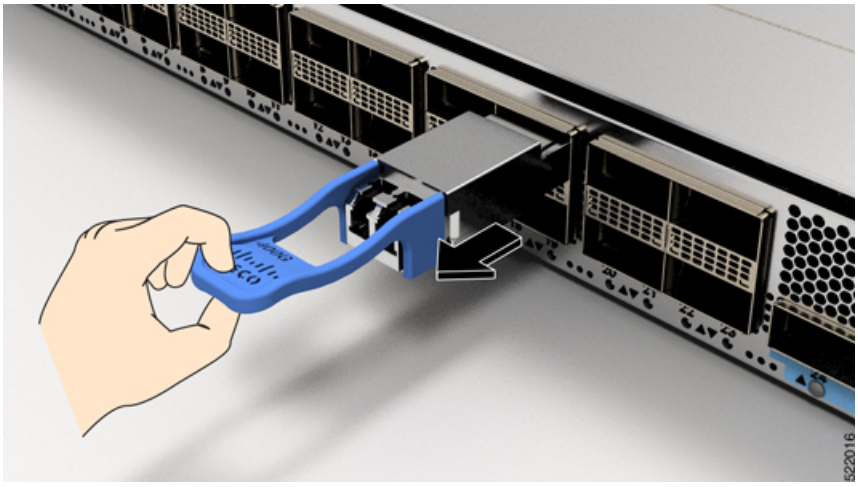
Procedure

Step 1 Disconnect the network interface cable from the transceiver connector.

Step 2 Install the dust plug immediately into the transceiver's optical bore.

Step 3 Grasp the pull-tab and gently pull to release the transceiver from the socket.

Figure 11: Removing the QSFP Transceiver Module



Step 4 Slide the transceiver out of the socket.

Step 5 Place the transceiver module into an antistatic bag.

Connect Interface Ports

You can connect optical interface ports on line cards with other devices for network connectivity.

Disconnect Optical Ports from the Network

When you need to remove fiber-optic transceivers, you must first remove the fiber-optic cables from the transceiver before you remove the transceiver from the port.

Maintain Transceivers and Optical Cables

Refer to Inspection and Cleaning Procedures for Fiber-Optic Connections document for inspection and cleaning processes for fiber optic connections.

Create the Initial Router Configuration

Assign an IP address to the router management interface to connect the router to the network.

When you initially power up the router, it boots up and displays a series of configuration-related questions. You can use the default choices for each configuration except for the IP address, which you must provide.

Note These routers are designed to boot up in less than 30 mins, provided the neighboring devices are in full-operational state.

When the system is powered on and the console port is connected to the terminal, the RP CPU messages are seen.

Note The Cisco 8608 router doesn't support BMC.

Before you begin

- A console device must be connected with the router.
- The router must be connected to a power source.
- Determine the IP address and netmask that is needed for the Management interfaces: `MgmtEth0/RP0/CPU0/0` and `MgmtEth0/RP1/CPU0/0:`

Procedure

Step 1 Power up the router.

The LEDs on each power supply light up (green) when the power supply units are sending power to the router, and the software asks you to specify a password to use with the router.

Step 2 When the system boots up for the first time, the system prompts you to create a new username and password. The following prompt appears:

```
!!!!!!!!!!!!!!!!!!! NO root-system username is configured. Need to configure root-system
username. !!!!!!!!!!!!!!!!!!!

--- Administrative User Dialog ---


Enter root-system username:
% Entry must not be null.

Enter root-system username: cisco
Enter secret:
Use the 'configure' command to modify this configuration.
User Access Verification

Username: cisco
Password:


RP/0/RP0/CPU0:ios#
```

Step 3 Enter a new password to use for this router.

The software checks the security strength of your password and rejects your password if the system does not consider it as a strong password. To increase the security strength of your password, make sure that it adheres to the following guidelines:

- At least eight characters
- Minimizes or avoids the use of consecutive characters (such as "abcd")
- Minimizes or avoids repeating characters (such as "AAA")
- Does not contain recognizable words in the dictionary
- Does not contain proper names
- Contains both uppercase and lowercase characters
- Contains numbers and letters

Note Cleartext passwords cannot include the dollar sign ($) special character.

Tip If a password is trivial (such as a short, easy-to-decipher password), the software rejects that password. Passwords are case-sensitive.

When you enter a strong password, the software asks you to confirm the password.

Step 4 Reenter the password.

When you enter the same password, the software accepts the password.

Step 5 Enter the configuration mode.

Step 6 Enter the IP address for the management interface. If using dual RPs, enter the IP address on both management interfaces.

Step 7 Enter a network mask for the management interface.

Step 8 Save your configuration.

Step 9 The software asks whether you want to edit the configuration. If you don't want to edit your configuration, enter '**no**'.

Verify Chassis Installation

After installing the chassis, use the following **show** commands to verify the installation and configuration in the EXEC mode. Any issue if detected, take corrective action before making further configurations.

Command	Description
show platform	Displays the state information of each card.
show redundancy	Displays the status of route processor redundancy.
show led	Displays LED information for the router, or for a specific LED location.
show hw-module fpd	Displays field-programmable device (FPD) compatibility for all modules or a specific module.
show alarms brief system active	Displays all existing alarms in the router.

Command	Description
show media	Displays the current state of the disk storage media.
show inventory	Displays information about the field replaceable units (FRUs), including product IDs, serial numbers, and version IDs.
show environment power	Displays the power usage information for the entire router.
show environment fan	Displays the status of the fan trays.

show environment temperature	Displays temperature readings for card temperature sensors. Each module has temperature sensors with two thresholds:
	• Minor temperature threshold – When a minor threshold is exceeded, minor alarm occurs and the following actions occur for all four sensors:
	  • Displays system messages
	  • Sends SNMP notifications (if configured)
	  • Log environmental alarm event that can be reviewed by running the show alarm command.
	• Major temperature threshold – When a major threshold is exceeded, a major alarm occurs and the following actions occur:
	  • For sensors 1, 3, and 4 (outlet and on board sensors), the following actions occur:
	  • Displays system messages.
	  • Sends SNMP notifications (if configured).
	  • Logs environmental alarm event that can be reviewed by running the show alarm command.
	  • For sensor 2 (intake sensor), the following actions occur:
	  • If the threshold is exceeded in a switching card, only that card is shut down.
	  • If the threshold exceeds an active Route Processor card with HA-standby or standby present, only that Route Processor card is shut down and the standby Route Processor card takes over.
	  • If you do not have a standby Route Processor card in your router, you have up to 2 minutes to decrease the temperature. During this interval, the software monitors the temperature every 5 seconds and continuously sends system messages as configured.
	Note • Cisco recommends that you install dual Route Processor cards.
	• For some card temperature sensors, the temperature thresholds for both minor and major might display 'NA'. This is an expected behaviour and indicates that there are no alarms for those corresponding thresholds.

show environment voltage	Displays the voltage for the entire router.

Command	Description
show environment current	Displays the current environment status.
show platform domain	Displays the active and standby modes of Route Processor Cards and Switch Cards.

show platform command

The following example shows a sample output from the **show platform** command:

```
Router#show platform
Wed Jul 12 14:36:14.897 UTC
Node              Type                       State                     Config state
--------------------------------------------------------------------------------
0/RP0/CPU0        8608-RP(Active)            IOS XR RUN                NSHUT
0/RP1/CPU0        8608-RP(Standby)           IOS XR RUN                NSHUT
0/SC0             8608-SC0-128               OPERATIONAL               NSHUT
0/SC1             8608-SC0-128               OPERATIONAL               NSHUT
0/FB0             8608-SC0-128[FB]           OPERATIONAL               NSHUT
0/FB1             8608-SC0-128[FB]           OPERATIONAL               NSHUT
0/0               86-MPA-4FH-M               OPERATIONAL               NSHUT
0/3               86-MPA-14H2FH-M            OPERATIONAL               NSHUT
0/FT0             8608-FAN                   OPERATIONAL               NSHUT
0/FT1             8608-FAN                   OPERATIONAL               NSHUT
0/FT2             8608-FAN                   OPERATIONAL               NSHUT
0/FT3             8608-FAN                   OPERATIONAL               NSHUT
0/FT4             8608-FAN                   OPERATIONAL               NSHUT
0/FT5             8608-FAN                   OPERATIONAL               NSHUT
0/FT6             8608-FAN                   OPERATIONAL               NSHUT
0/FT7             8608-FAN                   OPERATIONAL               NSHUT
0/PM0             PSU3.2KW-ACPI              OPERATIONAL               NSHUT
0/PM1             PSU3.2KW-ACPI              OPERATIONAL               NSHUT
```

show redundancy command

The following example shows a sample output from the **show redundancy** command:

```
Router#show redundancy
Wed Jul 12 14:41:17.597 UTC
Redundancy information for node 0/RP0/CPU0:
==========================================
Node 0/RP0/CPU0 is in ACTIVE role
Partner node (0/RP1/CPU0) is in STANDBY role
Standby node in 0/RP1/CPU0 is ready
Standby node in 0/RP1/CPU0 is NSR-ready

Reload and boot info
----------------------
RP reloaded Wed Jul 12 14:01:06 2023: 40 minutes ago
Active node booted Wed Jul 12 14:01:06 2023: 40 minutes ago
Standby node boot Mon Jan  1 19:13:53 2018: 5 years, 27 weeks, 3 days, 19 hours, 27 minutes
 ago
Standby node last went not ready Wed Jul 12 14:04:03 2023: 37 minutes ago
Standby node last went ready Wed Jul 12 14:05:50 2023: 35 minutes ago
Standby node last went not NSR-ready Wed Jul 12 14:03:46 2023: 37 minutes ago
Standby node last went NSR-ready Wed Jul 12 14:08:20 2023: 32 minutes ago
There have been 0 switch-overs since reload
```

```
Active node reload "0/SC0 reload triggered graceful chassis reload"
Standby node reload "0/SC0 reload triggered graceful chassis reload"
```

show led command

The following example shows a sample output from the **show led** command:

```
Router#show led
Wed Jul 12 14:41:20.426 UTC
================================================================================
Location        LED Name             Mode                 Color
================================================================================
0
                Attention            OPERATIONAL          OFF
0/0
                Attention            OPERATIONAL          OFF
                Status               OPERATIONAL          GREEN
0/3
                Attention            OPERATIONAL          OFF
                Status               OPERATIONAL          GREEN
0/FB0
                Attention            OPERATIONAL          OFF
                Status               OPERATIONAL          GREEN
0/FB1
                Attention            OPERATIONAL          OFF
                Status               OPERATIONAL          GREEN
0/FT0
                Status/Attention     OPERATIONAL          GREEN
0/FT1
                Status/Attention     OPERATIONAL          GREEN
0/FT2
                Status/Attention     OPERATIONAL          GREEN
0/FT3
                Status/Attention     OPERATIONAL          GREEN
0/FT4
                Status/Attention     OPERATIONAL          GREEN
0/FT5
                Status/Attention     OPERATIONAL          GREEN
0/FT6
                Status/Attention     OPERATIONAL          GREEN
0/FT7
                Status/Attention     OPERATIONAL          GREEN
0/PM0
                Attention            OPERATIONAL          OFF
                Fault                OPERATIONAL          OFF
                Input                OPERATIONAL          GREEN
                Output               OPERATIONAL          GREEN
0/PM1
                Attention            OPERATIONAL          OFF
                Fault                OPERATIONAL          OFF
                Input                OPERATIONAL          GREEN
                Output               OPERATIONAL          GREEN
0/RP0/CPU0
                Attention            OPERATIONAL          OFF
                BITS                 OPERATIONAL          OFF
                GNSS                 OPERATIONAL          OFF
                GPS                  OPERATIONAL          OFF
                RP-Active            OPERATIONAL          GREEN
                Status               OPERATIONAL          BLINKING RED
                Sync                 OPERATIONAL          OFF
                Timing-PTP           OPERATIONAL          OFF
0/RP1/CPU0
                Attention            OPERATIONAL          OFF
```

```
                BITS                OPERATIONAL         OFF
                GNSS                OPERATIONAL         OFF
                GPS                 OPERATIONAL         OFF
                RP-Active           OPERATIONAL         OFF
                Status              OPERATIONAL         GREEN
                Sync                OPERATIONAL         OFF
                Timing-PTP          OPERATIONAL         OFF
0/SC0
                Attention           OPERATIONAL         OFF
                Status              OPERATIONAL         GREEN
0/SC1
                Attention           OPERATIONAL         OFF
                Status              OPERATIONAL         GREEN
```

show hw-module fpd command

The following example shows a sample output from the **show hw-module fpd** command:

```
Router#show hw-module fpd
Wed Jul 12 14:41:23.437 UTC

Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure, A Anti Theft aware
                                                                                FPD Versions
                                                                                ============
Location   Card type            HWver FPD device       ATR Status   Running Programd
Reload Loc
-----------------------------------------------------------------------------------------------
0/RP0/CPU0 8608-RP              1.0   Bios             S   CURRENT    1.09    1.09
0/RP0/CPU0
0/RP0/CPU0 8608-RP              1.0   BiosGolden       BS  CURRENT            1.01
0/RP0/CPU0
0/RP0/CPU0 8608-RP              1.0   IoFpga           S   CURRENT    1.09    1.09
  0/RP0
0/RP0/CPU0 8608-RP              1.0   IoFpgaGolden     BS  CURRENT            1.09
  0/RP0
0/RP0/CPU0 8608-RP              1.0   SsdMicron7300M2      CURRENT    2.60    2.60
  0/RP0
0/RP0/CPU0 8608-RP              1.0   x86Fpga          S   CURRENT    1.07    1.07
  0/RP0
0/RP0/CPU0 8608-RP              1.0   x86FpgaGolden    BS  CURRENT            1.07
  0/RP0
0/RP0/CPU0 8608-RP              1.0   x86TamFw         S   CURRENT    7.12    7.12
  0/RP0
0/RP0/CPU0 8608-RP              1.0   x86TamFwGolden   BS  CURRENT            7.12
  0/RP0
0/RP1/CPU0 8608-RP              1.0   Bios             S   CURRENT    1.09    1.09
0/RP1/CPU0
0/RP1/CPU0 8608-RP              1.0   BiosGolden       BS  CURRENT            1.01
0/RP1/CPU0
0/RP1/CPU0 8608-RP              1.0   IoFpga           S   CURRENT    1.09    1.09
  0/RP1
0/RP1/CPU0 8608-RP              1.0   IoFpgaGolden     BS  CURRENT            1.09
  0/RP1
0/RP1/CPU0 8608-RP              1.0   SsdMicron7300M2      CURRENT    2.60    2.60
  0/RP1
0/RP1/CPU0 8608-RP              1.0   x86Fpga          S   CURRENT    1.07    1.07
  0/RP1
0/RP1/CPU0 8608-RP              1.0   x86FpgaGolden    BS  CURRENT            1.07
  0/RP1
0/RP1/CPU0 8608-RP              1.0   x86TamFw         S   CURRENT    7.12    7.12
  0/RP1
0/RP1/CPU0 8608-RP              1.0   x86TamFwGolden   BS  CURRENT            7.12
```

```
  0/RP1
0/PM0      PSU3.2KW-ACPI         1.0   EM-LogicMCU          CURRENT    0.10    0.10
NOT REQ
0/PM0      PSU3.2KW-ACPI         1.0   EM-PrimMCU           CURRENT    0.02    0.02
NOT REQ
0/PM0      PSU3.2KW-ACPI         1.0   EM-SecMCU            CURRENT    0.02    0.02
NOT REQ
0/PM1      PSU3.2KW-ACPI         1.0   EM-LogicMCU          CURRENT    0.10    0.10
NOT REQ
0/PM1      PSU3.2KW-ACPI         1.0   EM-PrimMCU           CURRENT    0.02    0.02
NOT REQ
0/PM1      PSU3.2KW-ACPI         1.0   EM-SecMCU            CURRENT    0.02    0.02
NOT REQ
0/0        86-MPA-4FH-M          1.0   IoFpga           S   CURRENT    1.02    1.02
    0/0
0/0        86-MPA-4FH-M          1.0   IoFpgaGolden     BS  CURRENT            1.02
    0/0
0/3        86-MPA-14H2FH-M       1.0   IoFpga           S   CURRENT    1.02    1.02
    0/3
0/3        86-MPA-14H2FH-M       1.0   IoFpgaGolden     BS  CURRENT            1.02
    0/3
0/SC0      8608-SC0-128          1.0   IoFpga           S   CURRENT    1.01    1.01
  0/SC0
0/SC0      8608-SC0-128          1.0   IoFpgaGolden     BS  CURRENT            1.01
  0/SC0
0/SC1      8608-SC0-128          1.0   IoFpga           S   CURRENT    1.01    1.01
  0/SC1
0/SC1      8608-SC0-128          1.0   IoFpgaGolden     BS  CURRENT            1.01
  0/SC1
0/FB0      8608-SC0-128[FB]      1.0   IoFpga               CURRENT    1.10    1.10
NOT REQ
0/FB0      8608-SC0-128[FB]      1.0   IoFpgaGolden     B   CURRENT            1.07
NOT REQ
0/FB1      8608-SC0-128[FB]      1.0   IoFpga               CURRENT    1.10    1.10
NOT REQ
0/FB1      8608-SC0-128[FB]      1.0   IoFpgaGolden     B   CURRENT            1.07
NOT REQ
```

show alarms brief system active command

The following example shows a sample output from the **show alarms brief system active** command:

```
Router#show alarms brief system active
Wed Jul 12 14:41:31.583 UTC

------------------------------------------------------------------------------------
Active Alarms
------------------------------------------------------------------------------------
Location        Severity     Group            Set Time                    Description



------------------------------------------------------------------------------------
0               Major        Environ          07/12/2023 14:03:04 UTC    Power Module
redundancy lost
```

show media command

The following example shows a sample output from the **show media** command:

```
Router#show media
Wed Jul 12 14:41:36.162 UTC

Media Info for Location: node0_RP0_CPU0
Partition                          Size     Used  Percent    Avail
-------------------------------------------------------------------
rootfs:                           71.6G     9.7G      13%      62G
data:                            339.1G     2.7G       1%   336.5G
/var/lib/docker                    9.4G      37M       1%     8.8G
disk0:                             9.4G      37M       1%     8.8G
log:                               9.4G     173M       2%     8.7G
harddisk:                           71G     704M       2%      66G
```

show inventory command

The following example shows a sample output from the **show inventory** command:

```
Router#show inventory
Wed Jul 12 14:41:39.052 UTC
NAME: "Rack 0", DESCR: "Cisco 8600 - 8 Slot Centralized Chassis"
PID: 8608-SYS          , VID: V00, SN: FOX2635PQK0

NAME: "0/RP0/CPU0", DESCR: "Cisco 8608 Route Processor"
PID: 8608-RP           , VID: V01, SN: FOC2520N3KW

NAME: "0/RP1/CPU0", DESCR: "Cisco 8608 Route Processor"
PID: 8608-RP           , VID: V01, SN: FOC2520N3LT

NAME: "0/0", DESCR: "Cisco 8600 4x400G RedundantMPA"
PID: 86-MPA-4FH-M      , VID: V01, SN: FOC2539NXBZ

NAME: "FourHundredGigE0/0/0/0", DESCR: "Non-Cisco QSFPDD 400G PASSIVE COPPER Pluggable
Optics Module"
PID: 2323766-2         , VID: 2, SN: 18169373

NAME: "FourHundredGigE0/0/0/1", DESCR: "Non-Cisco QSFPDD 400G PASSIVE COPPER Pluggable
Optics Module"
PID: 2323766-2         , VID: 2, SN: 18169373

NAME: "FourHundredGigE0/0/0/2", DESCR: "Non-Cisco QSFPDD 400G PASSIVE COPPER Pluggable
Optics Module"
PID: 2323766-2         , VID: 2, SN: 18169307

NAME: "FourHundredGigE0/0/0/3", DESCR: "Non-Cisco QSFPDD 400G PASSIVE COPPER Pluggable
Optics Module"
PID: 2323766-2         , VID: 2, SN: 18169307

NAME: "0/3", DESCR: "Cisco 8600 14x100G and 2x400G Combo Redundant MPA"
PID: 86-MPA-14H2FH-M   , VID: V01, SN: FOC2448N8ZA

NAME: "HundredGigE0/3/0/9", DESCR: "Cisco QSFP28 100G SR4 Pluggable Optics Module"
PID: QSFP-100G-SR4-S   , VID: V02, SN: AVF2202S1Y1

NAME: "HundredGigE0/3/0/2", DESCR: "Cisco QSFP28 100G SR4 Pluggable Optics Module"
PID: QSFP-100G-SR4-S   , VID: V02, SN: AVF2227S0MZ

NAME: "HundredGigE0/3/0/8", DESCR: "Cisco QSFP28 100G SR4 Pluggable Optics Module"
PID: QSFP-100G-SR4-S   , VID: V02, SN: AVF2144S2JH

NAME: "0/SC0", DESCR: "Cisco 8608 12.8T Switch Card"
PID: 8608-SC0-128      , VID: V01, SN: FOC2708N583

NAME: "0/SC1", DESCR: "Cisco 8608 12.8T Switch Card"
```

```
PID: 8608-SC0-128      , VID: V01, SN: FOC2708N57N

NAME: "0/FB0", DESCR: "8608 Fan Controller Board on 8608-SC0-128"
PID: 8608-SC0-128[FB]  , VID: V01, SN: FOC2708N52Y

NAME: "0/FB1", DESCR: "8608 Fan Controller Board on 8608-SC0-128"
PID: 8608-SC0-128[FB]  , VID: V01, SN: FOC2708N24B

NAME: "0/FT0", DESCR: "CISCO 8608 FAN"
PID: 8608-FAN          , VID: V01, SN: NCV26307038

NAME: "0/FT1", DESCR: "CISCO 8608 FAN"
PID: 8608-FAN          , VID: V01, SN: NCV26307054

NAME: "0/FT2", DESCR: "CISCO 8608 FAN"
PID: 8608-FAN          , VID: V01, SN: NCV26307046

NAME: "0/FT3", DESCR: "CISCO 8608 FAN"
PID: 8608-FAN          , VID: V01, SN: NCV2630703U

NAME: "0/FT4", DESCR: "CISCO 8608 FAN"
PID: 8608-FAN          , VID: V01, SN: NCV2630701R

NAME: "0/FT5", DESCR: "CISCO 8608 FAN"
PID: 8608-FAN          , VID: V01, SN: NCV2630705C

NAME: "0/FT6", DESCR: "CISCO 8608 FAN"
PID: 8608-FAN          , VID: V01, SN: NCV26307048

NAME: "0/FT7", DESCR: "CISCO 8608 FAN"
PID: 8608-FAN          , VID: V01, SN: NCV2630705S

NAME: "0/PM0", DESCR: "Cisco 3.2KW AC Power Supply Unit"
PID: PSU3.2KW-ACPI     , VID: V01, SN: ART2522B035

NAME: "0/PM1", DESCR: "Cisco 3.2KW AC Power Supply Unit"
PID: PSU3.2KW-ACPI     , VID: V01, SN: ART2546B00S
```

show environment power command

The following example shows a sample output from the **show environment power** command:

```
Router#show environment power
Wed Jul 12 14:41:45.688 UTC
===============================================================================
CHASSIS LEVEL POWER INFO: 0
===============================================================================
   Total output power capacity (N + 1)             :    6400W +        0W
   Total output power required                     :    4412W
   Total power input                               :     787W
   Total power output                              :     705W

===============================================================================
   Power       Supply         ------Input----   ------Output---     Status
   Module      Type            Volts     Amps    Volts     Amps
===============================================================================
   0/PM0       PSU3.2KW-ACPI   213.2     2.0     54.7      6.9      OK
   0/PM1       PSU3.2KW-ACPI   212.6     1.7     54.7      6.0      OK

Total of Power Modules:        787W/3.7A              705W/12.9A

===============================================================================
   Location     Card Type               Power       Power        Status
```

```
                                        Allocated   Used
                                        Watts       Watts
================================================================================
   0/RP0/CPU0   8608-RP                 200         49          ON
   0/RP1/CPU0   8608-RP                 200         49          ON
   0/SC0        8608-SC0-128            550         168         ON
   0/SC1        8608-SC0-128            550         166         ON
   0/FB0        8608-SC0-128[FB]        10          -           ON
   0/FB1        8608-SC0-128[FB]        10          -           ON
   0/0          86-MPA-4FH-M            350         125         ON
   0/1          -                       32          -           RESERVED
   0/2          -                       32          -           RESERVED
   0/3          86-MPA-14H2FH-M         350         159         ON
   0/4          -                       32          -           RESERVED
   0/5          -                       32          -           RESERVED
   0/6          -                       32          -           RESERVED
   0/7          -                       32          -           RESERVED
   0/FT0        8608-FAN                250         10          ON
   0/FT1        8608-FAN                250         9           ON
   0/FT2        8608-FAN                250         10          ON
   0/FT3        8608-FAN                250         10          ON
   0/FT4        8608-FAN                250         10          ON
   0/FT5        8608-FAN                250         9           ON
   0/FT6        8608-FAN                250         10          ON
   0/FT7        8608-FAN                250         10          ON
```

show environment fan command

The following example shows a sample output from the **show environment fan** command:

```
Router#show environment fan
Wed Jul 12 14:41:50.676 UTC
=============================================================
                                          Fan speed (rpm)
Location      FRU Type                    FAN_0    FAN_1
-------------------------------------------------------------

0/FT0        8608-FAN                      2880    2850
0/FT1        8608-FAN                      2820    2880
0/FT2        8608-FAN                      2820    2820
0/FT3        8608-FAN                      2880    2910
0/FT4        8608-FAN                      2880    2910
0/FT5        8608-FAN                      2850    2850
0/FT6        8608-FAN                      2880    2910
0/FT7        8608-FAN                      2910    2880
0/PM0        PSU3.2KW-ACPI                 5247    5225
0/PM1        PSU3.2KW-ACPI                 5247    5204 G
```

show environment temperature location *location* command

The following example shows a sample output from the **show environment temperature location** command. The location specified is **0/RP0/CPU0**:

```
Router#show environment temperature location 0/RP0/CPU0
Wed Jul 12 14:42:31.532 UTC
================================================================================================================
Location  TEMPERATURE                          Value     Crit    Major    Minor    Minor
  Major    Crit
           Sensor                            (deg C)     (Lo)     (Lo)     (Lo)     (Hi)
   (Hi)    (Hi)
----------------------------------------------------------------------------------------------------------------
```

```
0/RP0/CPU0
          Inlet_Temp                      27      -10        0         5        NA
    50       55
          X86_CORE_5_T                    67      -10       -5         0        NA
   100      105
          DIMM_TEMP1                      38      -10       -5         0        NA
    95      100
          DIMM_TEMP2                      37      -10       -5         0        NA
    95      100
          SSD_Temp                        40      -10       -5         0        NA
    80       83
          T1_2PLUS1_TEMP                  43      -10        0         5        NA
   105      115
          T1_1PLUS1_TEMP                  39      -10        0         5        NA
   105      115
          Outlet_Temp                     38      -10       -5         0        NA
   110      115
          Hot_Spot_Temp                   40       NA       NA        NA        NA
    NA      140
          X86_PKG_TEMP                    66      -10       -5         0        NA
   100      105
          X86_CORE_0_T                    66      -10       -5         0        NA
   100      105
          X86_CORE_1_T                    66      -10       -5         0        NA
   100      105
          X86_CORE_2_T                    66      -10       -5         0        NA
   100      105
          X86_CORE_3_T                    66      -10       -5         0        NA
   100      105
          X86_CORE_4_T                    67      -10       -5         0        NA
   100      105
```

show environment voltage location*location* command

The following example shows a sample output from the **show environment voltage location** command. The location specified is **0/RP0/CPU0**:

```
Router#show environment voltage location 0/RP0/CPU0
Wed Jul 12 14:42:40.711 UTC
==============================================================================================
Location  VOLTAGE                         Value      Crit     Minor     Minor      Crit
          Sensor                          (mV)       (Lo)     (Lo)      (Hi)       (Hi)
----------------------------------------------------------------------------------------------
0/RP0/CPU0
          P55V                          55025     44400     53000     57000     60000
          P1V0_ADC                        999       900       950      1050      1100
          P2V5_ADC                       2514      2250      2375      2625      2750
          MGTAVTT_OMG_ADC                1196      1080      1140      1260      1320
          EN_VP3P3_ADC                   3265      3003      3135      3465      3597
          P1V8_OMG_ADC                   1800      1620      1710      1890      1980
          P0V9_ADC                        894       810       855       945       990
          IBV                           12000     10800     11040     12840     13200
          VP3P3_I210                     3307      3003      3135      3465      3597
          VP1P0_VCS                       998       910       950      1050      1090
          VP2P5_VCS                      2509      2275      2375      2625      2725
          P3V3_ADC                       3318      2970      3135      3465      3630
          VP1V8_ZL                       1800      1638      1710      1890      1962
          VP3P3_ZL                       3300      3003      3135      3465      3597
          VP1P8_OCXO                     1800      1638      1710      1890      1962
          VP3P3_OCXO                     3299      3003      3135      3465      3597
          VP3P89                         3890      3610      3770      4010      4160
          VP3P3_STBY                     3299      3003      3135      3465      3597
```

```
VP2P5                          2510     2275     2375     2625     2725
VP3P3_HWL                      3306     3003     3135     3465     3597
VP7P0                          7000     6300     6440     7560     7700
VP3V3_GNSS                     3307     3003     3135     3465     3597
P5V0_ADC                       5032     4550     4750     5250     5450
VP5P0_ANT                      5015     4550     4750     5250     5450
VP1P3_CPU                      1300     1183     1235     1365     1417
VP1P5_CPU                      1500     1350     1380     1620     1650
VP1P7_CPU                      1699     1590     1640     1760     1810
VP3P3_CPU                      3305     3003     3135     3465     3597
VP1P8_CPU                      1785     1638     1710     1890     1962
VP0P6_A_CPU                     592      540      552      648      660
VP1P05_CPU                     1050      950      970     1130     1160
VP1P2_CPU                      1197     1080     1100     1300     1320
VP1P05_CPU_VCCSCSUS            1050      950      970     1130     1160
P5VISO_ADC                     5030     4550     4750     5250     5450
VP1P2_CPUFPGA_CORE             1200     1080     1100     1300     1320
VP3P3_SATA                     3303     3003     3135     3465     3597
PVCCIN                         1783     1638     1710     1890     1962
P1V05_VCCSCSUS                 1050      950      970     1130     1160
P1V2_VDDQ                      1199     1080     1100     1300     1320
P1V05_COMBINED                 1050      950      970     1130     1160
USB_5VA_ADC                    5030     4550     4750     5250     5450
P3V3_BPID_ADC                  3315     3003     3135     3465     3597
P5V0_CHLED_ADC                 5032     4550     4750     5250     5450
P1V0_MGT_ADC                    999      900      950     1050     1100
```

show environment current location *location* command

The following example shows a sample output from the **show environment current location** command. The location specified is **0/RP0/CPU0**:

```
Router#show environment current location 0/RP0/CPU0
Wed Jul 12 14:42:48.023 UTC
==============================================================================================================
Location  CURRENT                                Value
          Sensor                                 (mA)
--------------------------------------------------------------------------------------------------------------
0/RP0/CPU0
          P55V_CURRENT                            897
          CPU_CORE_CURRENT                      11468
          P1V05_SUS_CURRENT                       748
          DDR4_CURRENT                           2058
          P1V05_IO_CURRENT                       2335
```

show platform domain command

The following example shows a sample output from the **show platform domain** command:

```
Router#show platform domain
Wed Jul 19 21:50:13.913 UTC
ID  Name                Lead           HA Role        State
 ------------------------------------------------------------------------------
1   DOMAIN_RP0_SC0      0/RP0/CPU0     ACTIVE         READY
2   DOMAIN_RP1_SC1      0/RP1/CPU0     STANDBY        READY
```