



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.

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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, make sure 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 an 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 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 on each of the line cards 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:

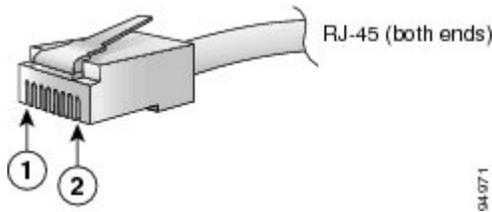
- Router chassis
 - CONSOLE port
 - MGMT ETH port



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



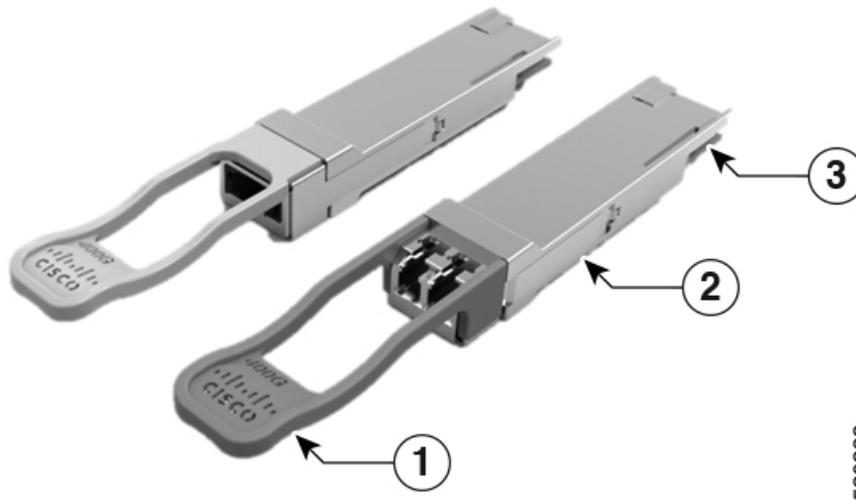
1	Pin 1	2	Pin 8
---	-------	---	-------

Install and Remove 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 2: 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 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 and do not have optical modules plugged in. If optical modules are plugged in but not in use, the dust caps that were supplied with the optical modules, should be used to protect the TX and RX surfaces of the optical module.

Be sure to clean the optic surfaces of the fiber cables before you plug them back into the optical ports of another module.

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 following table provides the supported port details and operating temperature of the QDD-400G-ZR-S and QDD-400G-ZRP-S optical modules when port side exhaust or port side intake fans and power supplies are used.

Table 1: Supported Ports and Operating Temperature of QDD-400G-ZR-S and QDD-400G-ZRP-S Optical Modules

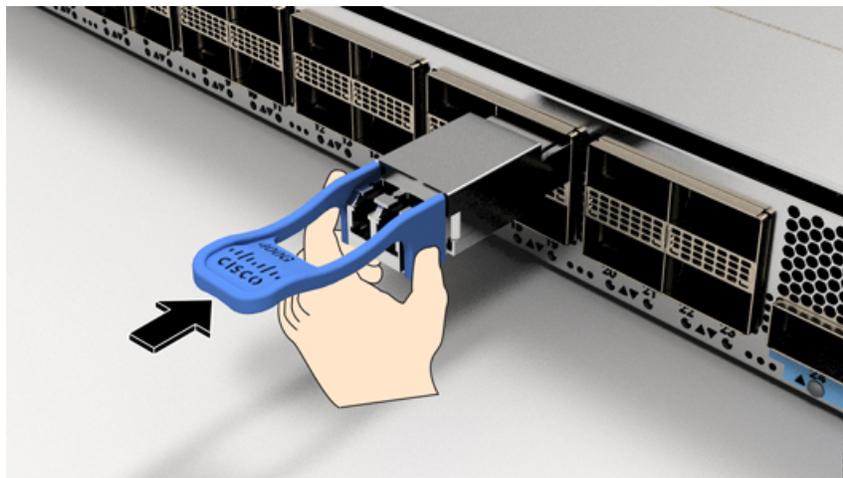
Line Cards	Port Side Intake Fans and Power Supplies	Port Side Exhaust Fans and Power Supplies	Port Side Intake Operating Temperature
8800-LC-36FH	<ul style="list-style-type: none"> • QDD-400G-ZR-S – supported on all 400G ports • QDD-400G-ZRP-S – supported on even-numbered 400G ports 	NA	40° C at sea level or 35° C at 1500 meter
88-LC0-36FH-M	<ul style="list-style-type: none"> • QDD-400G-ZR-S – supported on all 400G ports • QDD-400G-ZRP-S – supported on even-numbered 400G ports 	NA	40° C at sea level or 35° C at 1500 meter
88-LC0-36FH	<ul style="list-style-type: none"> • QDD-400G-ZR-S – supported on all 400G ports • QDD-400G-ZRP-S – supported on even-numbered 400G ports 	NA	40° C at sea level or 35° C at 1500 meter

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.

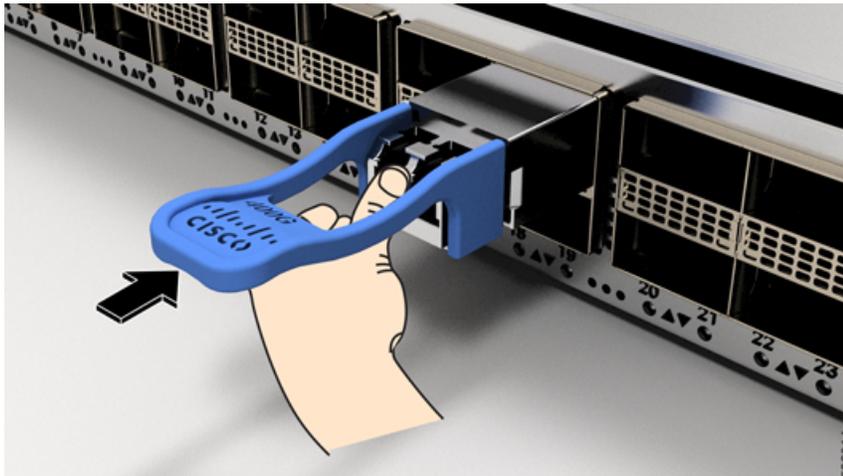
Figure 3: Installing the QSFP Transceiver Module



- 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 4: 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.

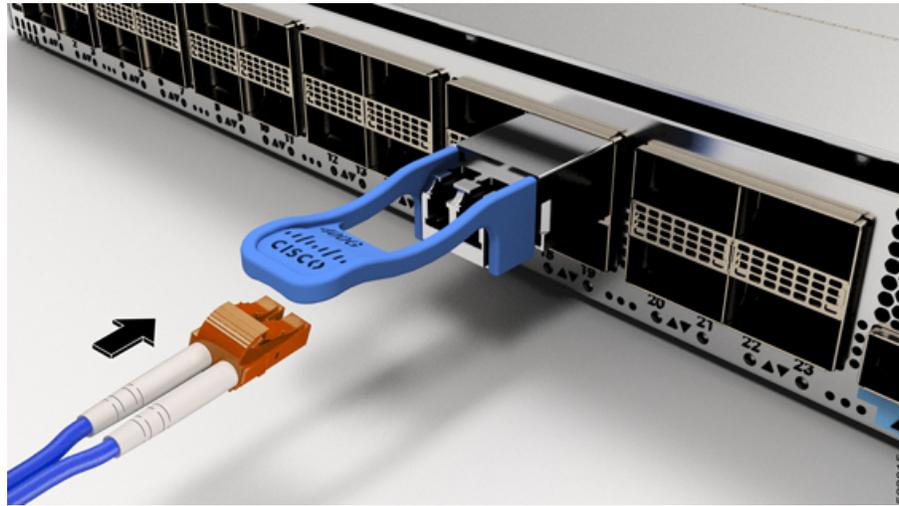


Note Inspect the MPO connector for the correct cable type, cleanliness, and any damage. For complete information on inspecting and cleaning fiber-optic connections, see the [Inspection and Cleaning Procedures for Fiber-Optic Connections](#) document.

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 5: Cabling a Transceiver Module



Removing the Transceiver Module



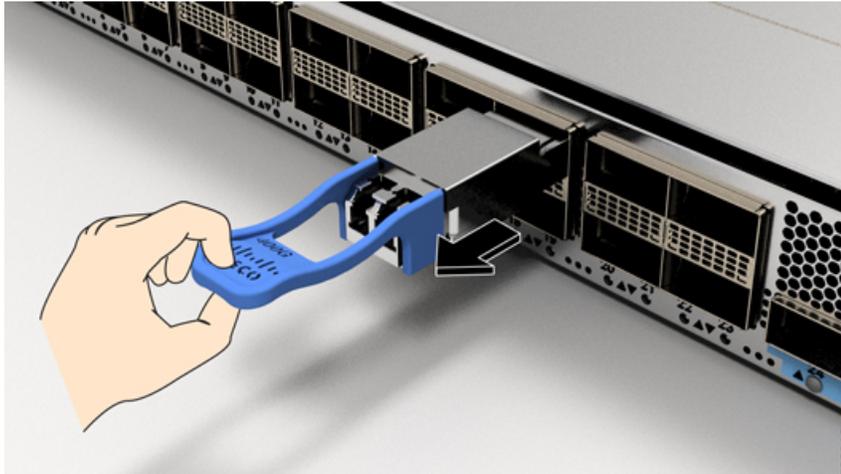
Caution The transceiver module is a static-sensitive device. Always use an ESD wrist strap or similar individual grounding device when handling transceiver modules or coming into contact with modules.

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 6: 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.

Connect a Fiber-Optic Port to the Network

Depending on which line card model that you are using, you can use either QSFP+ or QSFP28 transceivers. Some transceivers work with fiber-optic cables that you attach to the transceivers and other transceivers work with pre-attached copper cables. You must install a transceiver in the port before installing the fiber-optic cable in the transceiver.



Caution Removing and installing a transceiver can shorten its useful life. Do not remove and insert transceivers any more than is absolutely necessary. We recommend that you disconnect cables before installing or removing transceivers to prevent damage to the cable or transceiver.

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. You can toggle between BMC CPU messages and RP CPU messages by pressing the hot-key sequence Ctrl-O.

To configure IP address for Ethernet port on BMC and other additional information that is related to BMC, please see the *System Setup Guide for Cisco 8000 Series Routers*.

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 The software asks whether you want to edit the configuration. Enter **'no'** to decline.

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.
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	Displays all the environment-related router information.

Command	Description
show environment temperature	<p>Displays temperature readings for card temperature sensors. Each Route Processor, line card, and fabric cards have temperature sensors with two thresholds:</p> <ul style="list-style-type: none"> • Minor temperature threshold – When a minor threshold is exceeded, minor alarm occurs and the following actions occur for all four sensors: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • For sensors 1, 3, and 4 (outlet and on board sensors), the following actions occur: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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. <p>Note</p> <ul style="list-style-type: none"> • 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 power	Displays the power usage information for the entire router.
show environment voltage	Displays the voltage for the entire router.
show environment current	Displays the current environment status.

Command	Description
show environment fan	Displays the status of the fan trays.

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

Location	TEMPERATURE	Value	Crit	Major	Minor	Minor
Major	Crit	(deg C)	(Lo)	(Lo)	(Lo)	(Hi)
(Hi)	Sensor					

0/RP0/CPU0						
	Inlet_Temp	30	-10	-5	0	46
50	52					
	X86_CORE_5_T	72	-10	-5	0	NA
100	105					
	DIMM_TEMP1	44	-10	-5	0	NA
95	100					
	DIMM_TEMP2	43	-10	-5	0	NA
95	100					
	SSD_Temp	48	-10	-5	0	NA
80	83					
	T1_2PLUS1_TEMP	45	-10	-5	0	125
130	135					
	T1_1PLUS1_TEMP	44	-10	-5	0	125
130	135					
	Outlet_Temp	44	NA	NA	NA	NA
NA	140					
	Hot_Spot_Temp	44	NA	NA	NA	NA
NA	140					
	X86_PKG_TEMP	72	-10	-5	0	NA
100	105					
	X86_CORE_0_T	73	-10	-5	0	NA
100	105					
	X86_CORE_1_T	72	-10	-5	0	NA
100	105					
	X86_CORE_2_T	73	-10	-5	0	NA
100	105					
	X86_CORE_3_T	73	-10	-5	0	NA
100	105					
	X86_CORE_4_T	73	-10	-5	0	NA
100	105					

Location	VOLTAGE	Value	Crit	Minor	Minor	
Crit	Sensor	(mV)	(Lo)	(Lo)	(Hi)	
(Hi)						

0/RP0/CPU0						
	IBV	10288	8928	9312	11536	
11984						
	VP1P8_OCXO	1806	1638	1710	1890	
1962						
	P1_8V	1816	1638	1710	1890	
1962						
	P1_0V_ALDRIN_SD	1006	910	950	1050	
1090						
	P1_0V_ALDRIN_CRE	985	930	970	1030	

Verify Chassis Installation

```

1070
1090      P1V                      1006      910      950      1050
981      P0_9V                      911      819      855      945

```

```

=====
Location  CURRENT                      Value
          Sensor                      (mA)
-----
0/RP0/CPU0
          MB_VP54P0V_curr          1448
=====

```

```

=====
Location      FRU Type                      Fan speed (rpm)
          FAN_0      FAN_1      FAN_2      FAN_3      FAN_4      FAN_5
-----
0/FT0      8812-FAN          8130      8100      8160      8160      8160      8100
0/FT1      8812-FAN          8190      8160      8250      8190      8160      8160
0/FT2      8812-FAN          8130      8160      8190      8190      8220      8190
0/FT3      8812-FAN          8460      8400      8460      8400      8400      8370
0/PT0-PM0  PSU6.3KW-HV          7010      7290
0/PT0-PM1  PSU6.3KW-HV          7204      7677
0/PT0-PM2  PSU6.3KW-HV          8559      8709
=====

```

CHASSIS LEVEL POWER INFO: 0

```

=====
Total output power capacity (N + 1)      : 17400W + 0W
Total output power required              : 15280W
Total power input                        : 8571W
Total power output                       : 8185W
=====

```

```

=====
Power      Supply      -----Input-----      -----Output---      Status
Module     Type              Volts A/B      Amps A/B      Volts      Amps
-----
0/PT0-PM0  PSU6.3KW-HV      205.0/205.3  7.4/7.6      54.0      54.4      OK
0/PT0-PM1  PSU6.3KW-HV      205.0/205.0  7.5/7.9      54.3      56.0      OK
0/PT0-PM2  PSU6.3KW-HV      0.0 /205.0  0.0/11.4     53.7      41.1      OK
=====

```

```

Total of Power Modules:      10307W/46.0A      9691W/176.0A
=====

```

```

=====
Location      Card Type                      Power      Power      Status
          Power      Allocated      Used
          Watts      Watts
-----
0/RP0/CPU0    8800-RP                      249      80      ON
0/RP1/CPU0    8800-RP                      249      73      ON
0/0/CPU0      -                            25      -      RESERVED
0/1/CPU0      8800-LC-48H                  1365     499     ON
0/2/CPU0      8800-LC-48H                  1365     499     ON
0/3/CPU0      8800-LC-48H                  1365     509     ON
0/4/CPU0      8800-LC-48H                  1365     503     ON
0/5/CPU0      8800-LC-48H                  1365     511     ON
0/6/CPU0      8800-LC-48H                  1365     664     ON
0/7/CPU0      8800-LC-48H                  1365     501     ON
0/8/CPU0      8800-LC-48H                  1365     499     ON
=====

```

0/9/CPU0	8800-LC-48H	1365	501	ON
0/10/CPU0	8800-LC-48H	1365	495	ON
0/11/CPU0	8800-LC-48H	1365	506	ON
0/FC0	-	1040	-	RESERVED
0/FC1	8812-FC	1040	524	ON
0/FC2	8812-FC	1040	528	ON
0/FC3	8812-FC	1040	523	ON
0/FC4	8812-FC	1040	529	ON
0/FC5	8812-FC	1040	531	ON
0/FC6	-	1040	-	RESERVED
0/FC7	-	1040	-	RESERVED
0/FT0	8812-FAN	762	370	ON
0/FT1	8812-FAN	762	364	ON
0/FT2	8812-FAN	762	362	ON
0/FT3	8812-FAN	762	371	ON

The following example displays the temperature readings for each of the powered-up cards using the **show environment temperatures** command:

Location	TEMPERATURE	Value	Crit	Major	Minor	Minor
Major	Crit					
(Hi)	Sensor	(deg C)	(Lo)	(Lo)	(Lo)	(Hi)
(Hi)	(Hi)					

0/RP0/CPU0						
	Inlet_Temp	28	-10	-5	0	60
65	70					
	Pwr_Brick_Temp2	33	-10	-5	0	120
125	130					
	Mosfet_54v_Temp1	27	-10	-5	0	120
125	130					
	Mosfet_54v_Temp2	27	-10	-5	0	120
125	130					
	SSD_Temp	26	-10	-5	0	65
72	80					
	Outlet_Temp	29	-10	-5	0	80
85	90					
	Hot_Spot_1_Temp	31	-10	-5	0	80
85	90					
	Hot_Spot_2_Temp	31	-10	-5	0	80
85	90					
	TMP421_Temp	30	-10	-5	0	95
100	105					
	PEX8725_Temp	39	-10	-5	0	95
100	105					
	X86_PKG_TEMP	39	-10	-5	0	93
97	102					
	Pwr_Brick_Temp1	34	-10	-5	0	120
125	130					
	ALDRIN_TEMP_0	36	-5	0	5	95
100	110					
	Control_Sensor	28	-10	-5	0	60
65	70					
0/FT0						
	Hotswap_Temp	29	-10	-5	0	65
75	85					
	Low_vol_Temp	31	-10	-5	0	65
75	85					
0/FT1						
	Hotswap_Temp	30	-10	-5	0	65

75	85					
	Low_vol_Temp	32	-10	-5	0	65
75	85					
0/FT2						
	Hotswap_Temp	31	-10	-5	0	65
75	85					
	Low_vol_Temp	32	-10	-5	0	65
75	85					
0/FT3						
	Hotswap_Temp	31	-10	-5	0	65
75	85					
	Low_vol_Temp	32	-10	-5	0	65
75	85					
0/PT0-PM0						
	! PFC_B_Temp	10245	-10	-5	0	125
127	130					
	Inlet_Temp	28	-10	-5	0	65
67	70					
	HSNK_Temp	100	-10	-5	0	125
127	130					
	Outlet_Temp	87	-10	-5	0	105
108	110					
	! LLC_B_Temp	10245	-10	-5	0	125
127	130					
	! SR_B_Temp	10245	-10	-5	0	125
127	130					
	! ORING_B_Temp	10245	-10	-5	0	125
127	130					
	! PFC_A_Temp	10245	-10	-5	0	125
127	130					
	! LLC_A_Temp	10245	-10	-5	0	125
127	130					
	! SR_A_Temp	10245	-10	-5	0	125
127	130					
	! ORING_A_Temp	10245	-10	-5	0	125
127	130					
0/PT0-PM1						
	! PFC_B_Temp	10245	-10	-5	0	125
127	130					
	Inlet_Temp	28	-10	-5	0	65
67	70					
	HSNK_Temp	99	-10	-5	0	125
127	130					
	Outlet_Temp	87	-10	-5	0	105
108	110					
	! LLC_B_Temp	10245	-10	-5	0	125
127	130					
	! SR_B_Temp	10245	-10	-5	0	125
127	130					
	! ORING_B_Temp	10245	-10	-5	0	125
127	130					
	! PFC_A_Temp	10245	-10	-5	0	125
127	130					
	! LLC_A_Temp	10245	-10	-5	0	125
127	130					
	! SR_A_Temp	10245	-10	-5	0	125
127	130					
	! ORING_A_Temp	10245	-10	-5	0	125
127	130					
0/PT0-PM2						
	PFC_B_Temp	72	-10	-5	0	125
127	130					
	Inlet_Temp	25	-10	-5	0	65
67	70					

127	HSNK_Temp	72	-10	-5	0	125
127	130					
108	Outlet_Temp	61	-10	-5	0	105
127	110					
127	LLC_B_Temp	69	-10	-5	0	125
127	130					
127	SR_B_Temp	58	-10	-5	0	125
127	130					
127	ORING_B_Temp	64	-10	-5	0	125
127	130					
127	! PFC_A_Temp	0	-10	-5	0	125
127	130					
127	! LLC_A_Temp	0	-10	-5	0	125
127	130					
127	! SR_A_Temp	0	-10	-5	0	125
127	130					
127	! ORING_A_Temp	0	-10	-5	0	125
127	130					



Caution Please be careful while increasing the Altitude setting, as it leads to a rise in control sensor values and consequently the Chassis could shut down immediately if the control sensor crosses the critical threshold.

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

```

=====
CHASSIS LEVEL POWER INFO: 0
=====
Total output power capacity (N + 1)      : 107100W + 6300W
Total output power required              : 25015W
Total power input                        : 6019W
Total power output                       : 4636W
=====

Power      Supply      -----Input-----  -----Output-----  Status
Module     Type                Volts A/B   Amps A/B   Volts      Amps
=====

0/PT0-PM0  PSU6.3KW-HV          402.3/401.5 0.5/0.4   55.6       4.9       OK
0/PT0-PM1  PSU6.3KW-HV          400.6/400.9 0.5/0.5   55.6       6.0       OK
0/PT0-PM2  PSU6.3KW-HV          400.6/400.6 0.5/0.4   55.5       5.0       OK
0/PT1-PM0  PSU6.3KW-HV          400.0/400.0 0.5/0.3   55.4       4.4       OK
0/PT1-PM1  PSU6.3KW-HV          401.8/401.8 0.4/0.3   55.6       3.7       OK
0/PT1-PM2  PSU6.3KW-HV          400.0/400.0 0.4/0.3   55.4       3.6       OK
0/PT2-PM0  PSU6.3KW-HV          401.5/401.5 0.5/0.4   55.6       4.8       OK
0/PT2-PM1  PSU6.3KW-HV          400.0/400.0 0.4/0.4   55.4       4.4       OK
0/PT2-PM2  PSU6.3KW-HV          401.2/401.5 0.5/0.4   55.6       5.0       OK
0/PT3-PM0  PSU6.3KW-HV          300.6/300.9 0.6/0.5   55.5       4.4       OK
0/PT3-PM1  PSU6.3KW-HV          299.7/299.7 0.6/0.4   55.5       4.4       OK
0/PT3-PM2  PSU6.3KW-HV          300.6/300.9 0.5/0.6   55.3       4.4       OK
0/PT4-PM0  PSU6.3KW-HV          299.7/299.7 0.5/0.6   55.2       4.4       OK
0/PT4-PM1  PSU6.3KW-HV          300.6/300.9 0.6/0.5   55.4       4.7       OK
0/PT4-PM2  PSU6.3KW-HV          299.7/299.7 0.5/0.6   55.2       4.4       OK
0/PT5-PM0  PSU6.3KW-HV          300.6/300.9 0.7/0.6   55.6       6.0       OK
0/PT5-PM1  PSU6.3KW-HV          299.7/299.7 0.5/0.5   55.4       4.0       OK
0/PT5-PM2  PSU6.3KW-HV          300.6/300.9 0.5/0.6   55.4       5.1       OK

Total of Power Modules:          6019W/17.5A          4636W/83.6A
=====

Location      Card Type                Power      Power      Status
=====

```

		Allocated Watts	Used Watts	
0/RP0/CPU0	8800-RP	95	70	ON
0/RP1/CPU0	8800-RP	95	69	ON
0/0/CPU0	-	60	-	RESERVED
0/1/CPU0	-	60	-	RESERVED
0/2/CPU0	-	60	-	RESERVED
0/3/CPU0	-	60	-	RESERVED
0/4/CPU0	-	60	-	RESERVED
0/5/CPU0	8800-LC-48H	1065	489	ON
0/6/CPU0	-	60	-	RESERVED
0/7/CPU0	-	60	-	RESERVED
0/8/CPU0	-	60	-	RESERVED
0/9/CPU0	-	60	-	RESERVED
0/10/CPU0	-	60	-	RESERVED
0/11/CPU0	-	60	-	RESERVED
0/12/CPU0	-	60	-	RESERVED
0/13/CPU0	-	60	-	RESERVED
0/14/CPU0	-	60	-	RESERVED
0/15/CPU0	-	60	-	RESERVED
0/16/CPU0	-	60	-	RESERVED
0/17/CPU0	8800-LC-36FH	1896	679	ON
0/FC0	-	1713	-	RESERVED
0/FC1	-	1713	-	RESERVED
0/FC2	-	1713	-	RESERVED
0/FC3	-	1713	-	RESERVED
0/FC4	8818-FC	1713	429	ON
0/FC5	8818-FC	1713	435	ON
0/FC6	-	1713	-	RESERVED
0/FC7	-	1713	-	RESERVED
0/FT0	8818-FAN	1800	574	ON
0/FT1	8818-FAN	1800	587	ON
0/FT2	8818-FAN	1800	569	ON
0/FT3	8818-FAN	1800	578	ON

Set Fabric Bandwidth Threshold

Fabric bandwidth refers to the bandwidth requirements for communication and traffic flow between the line card and fabric card. The following table provides explanation of terminologies that are associated with fabric bandwidth.

Table 2: Fabric Bandwidth

Fabric Bandwidth	Definition	Significance
Total fabric bandwidth	Maximum bandwidth that is supported between a line card NPU and all fabric cards.	It is a constant value that is defined by the hardware capacity.
Available bandwidth	Total fabric bandwidth available for traffic.	It is a variable denoting real-time bandwidth consumption.

Fabric Bandwidth	Definition	Significance
Bandwidth threshold	A percentage value denoting a limit for bandwidth consumption. Being a system level setting, the threshold applies to all the line card NPUs in the chassis.	It is a user configurable limit; default value is 5%.
Total required bandwidth	Total Fabric Bandwidth x Bandwidth Threshold.	If is a calculated value as a function of user-defined threshold. Network interfaces on line card are active only when “Available bandwidth” is more than “Total required bandwidth”.
Lower required bandwidth	Total fabric bandwidth x (Bandwidth Threshold - 10%) This computation is applicable only for bandwidth threshold values 20% or higher. For bandwidth threshold values of below 20%, the “Lower required bandwidth” is equal to “Total required bandwidth”.	If is also a calculated value as a function of user-defined threshold and denotes a lower cut-off for disabling network interfaces on line card. Disabling happens when “Available bandwidth” falls below the “Lower required bandwidth”.

The Bandwidth Threshold acts a check point to ensure substantial bandwidth availability to carry traffic to the fabric cards. To configure the bandwidth threshold, use the following commands:

```
Router# configure
Router (config)# hw-module profile bw-threshold <value>
Router (config)# commit
```

User can set the threshold value starting with 10 and in increments of 10.

For example, consider that the bandwidth threshold is set to 20%. If the available bandwidth goes below 10%, then the network interfaces of the line card are shut. If the available bandwidth goes above 20%, then the network interfaces of the line card are unshut. The following table provides threshold references.

Table 3: Threshold Reference

Threshold	Percentage								
Bandwidth threshold	5	10	20	30	40	50	60	70	80
Total required bandwidth	5	10	20	30	40	50	60	70	80
Lower required bandwidth	5	10	10	20	30	40	50	60	70

