Hardware Installation Guide for Cisco 8700 Series Routers

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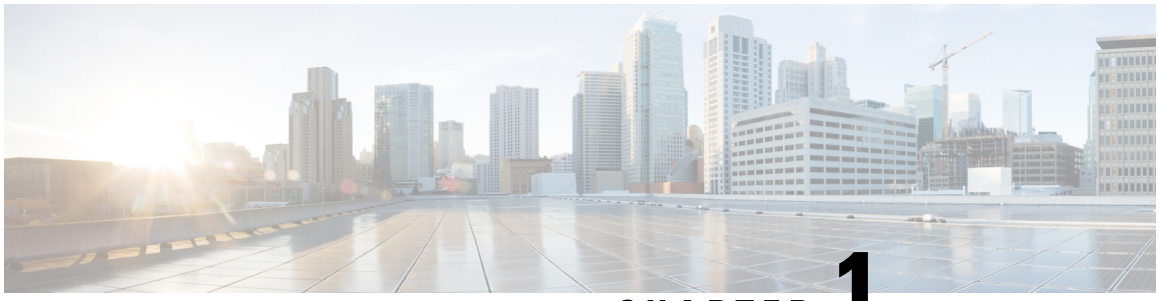


CHAPTER 1

Cisco 8700 Series Routers Overview

Cisco 8700 Series Routers

Cisco 8711-32FH-M

The Cisco 8711-32FH-M is a P100 silicon chip-based router that provides 12.8 Tbps of network bandwidth. The Cisco 8711-32FH-M is a fixed-port, high density, one rack-unit form factor router. Supported ports include 32 QSFP56-DD 400GbE ports. It includes HBM/2.5D for advanced performance, and supports Cisco 400GbE Digital Coherent Optical Modules.

Cisco 8711-32FH-M Router Front View

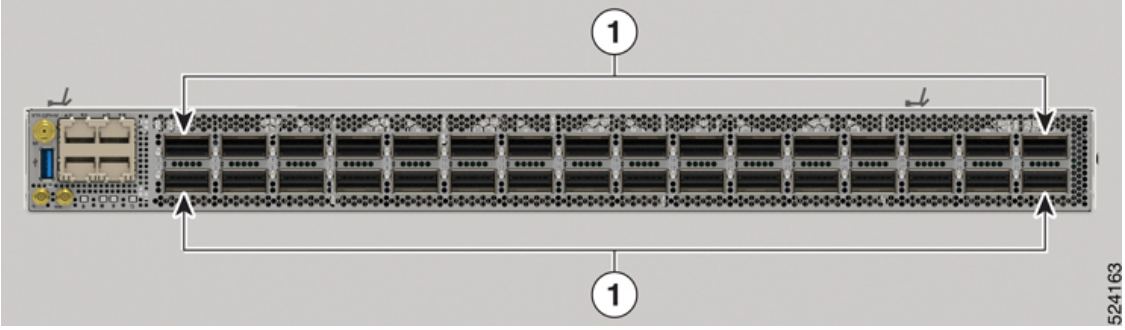
The front of the chassis has the following:

- 32 x QSFP56-DD or 16 x 800G QSFP-DD800 ports

Note The QSFP-DD800 ports support 2x400GbE and 8x100GbE traffic. You can have any combination of the available 400GbE or 800G ports that must not exceed the total bandwidth of 12.8 Tbps.

- Ports 4 through 11 do not support 40GbE traffic or 4x10GbE breakout operation.

Figure 1: Cisco 8711-32FH-M - Front View



1	32 QSFP56-DD 400GbE ports **Note** The top row is 16 x 800G QSFP-DD800 capable ports.

Cisco 8711-32FH-M Router Rear View

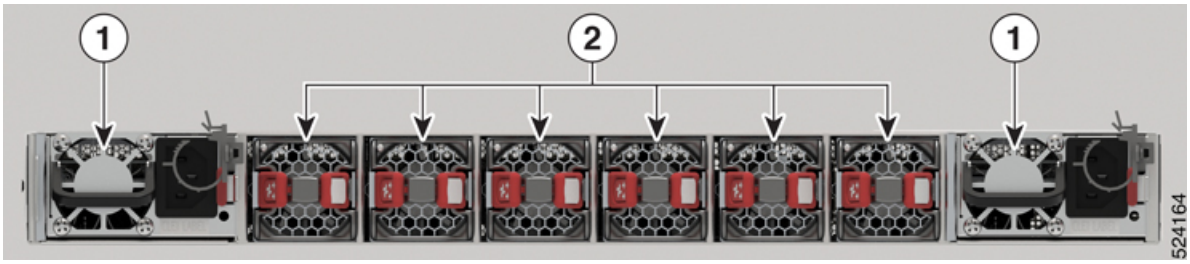
This table details the modules available in the rear of the chassis:

Table 1: Cisco 8711-32FH-M Router Rear View Details

Module Type	Description	Airflow Directions	Module Color
Power Supply Modules	Two 2KW power modules that operate at 12 V capacity, providing 1+1 power redundancy and different AC/DC inputs capabilities.	Port-Side-Intake (PSI)	Burgundy
		Port-Side-Exhaust (PSE)	Cisco Safety Blue
Fan Modules	Six 40mm counter-rotating double-fan trays providing N+1 redundancy. The fan modules can be removed individually.	Port-Side-Intake (PSI)	Burgundy
		Port-Side-Exhaust (PSE)	Cisco Safety Blue

Note The chassis does not come preloaded with fans and power supply units.

Figure 2: Cisco 8711-32FH-M - Rear View



1	Power Supply
2	Fans

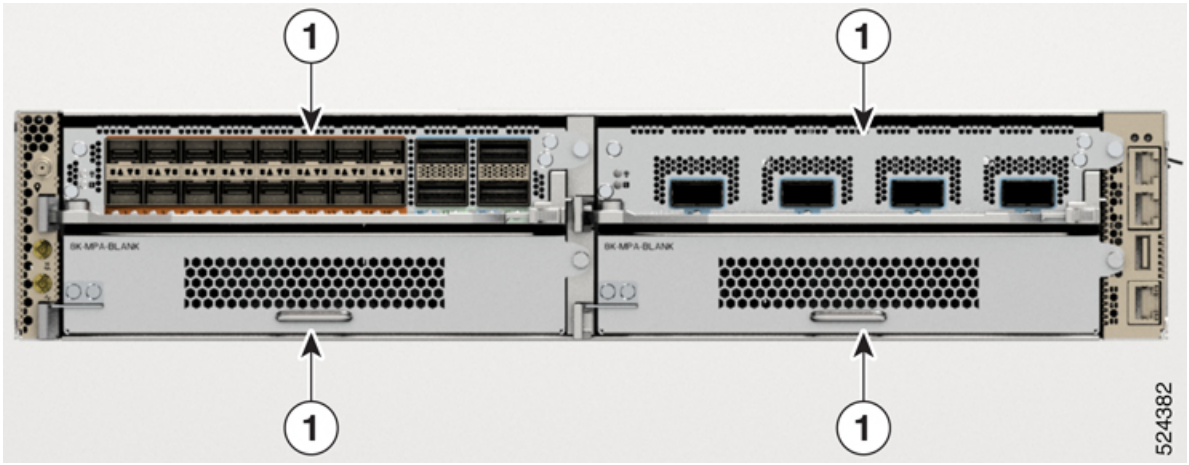
Note The fans and power modules illustrated have Port-Side-Intake (PSI) configuration.

Cisco 8712-MOD-M

The Cisco 8712-MOD-M is a K100-based, 2-RU router that provides 6.4 Tbps of network bandwidth and supports fixed architecture with I/O diversity.

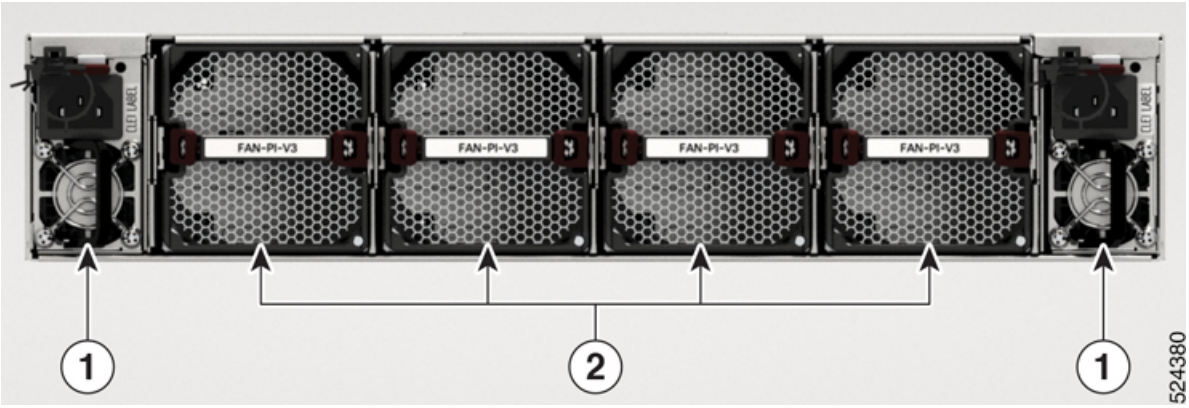
The front of the chassis has four pluggable Modular Port Adapters (MPAs) slots.

Figure 3: Cisco 8712-MOD-M - Front View



1	Modular Port Adapters (MPAs) Slots

Figure 4: Cisco 8712-MOD-M - Rear View



1	Power Supply Slots
2	Fan Slots

This table details the modules available in the rear of the chassis:

Table 2: Cisco 8712-MOD-M Router Rear View Details

Module Type	Description	Airflow Directions	Module Color
Power Supply Modules	Two 2KW power modules that operate at 12 V capacity, providing 1+1 power redundancy and different AC/DC inputs capabilities.	Port-Side-Intake (PSI)	Burgundy
		Port-Side-Exhaust (PSE)	Cisco Safety Blue
Fan Modules	Four 80mm counter-rotating double-fan trays providing N+1 redundancy. The fan modules can be removed individually.	Port-Side-Intake (PSI)	Burgundy
		Port-Side-Exhaust (PSE)	Cisco Safety Blue

Note The airflow direction must be the same for all power supply and fan modules in the chassis. That is, you must use PSI power modules with PSI fan modules and PSE power module with PSE fan modules only.

The following table describes the Cisco 8712-MOD-M router components, and the supported quantity.

Table 3: Cisco 8712-MOD-M Router Components

Component	Quantity
MPA	4
Fan module	4

Component	Quantity
Power module	2 AC or 2 DC

Modular Port Adapters Overview

Cisco 8712 Series Routers support the following Modular Port Adapters (MPAs):

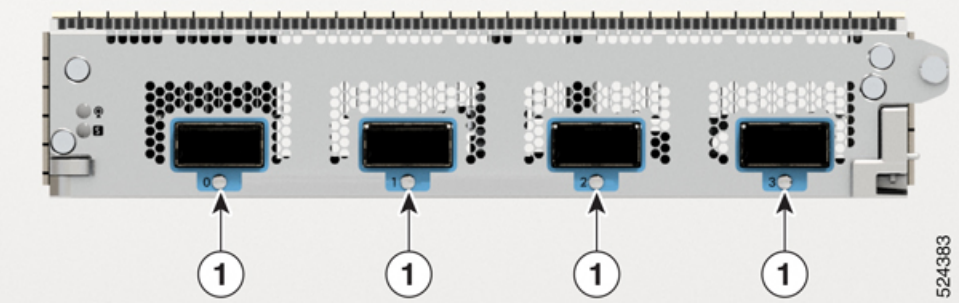
Table 4: Supported MPAs on Cisco 8700 Router

MPA PIDs	Transceivers
8K-MPA-4D	QSFP-DD
8K-MPA-16H	QSFP28
8K-MPA-16Z2D	QSFP-DD/zSFP56+
8K-MPA-18Z1D	QSFP-DD/zSFP56+

8K-MPA-4D

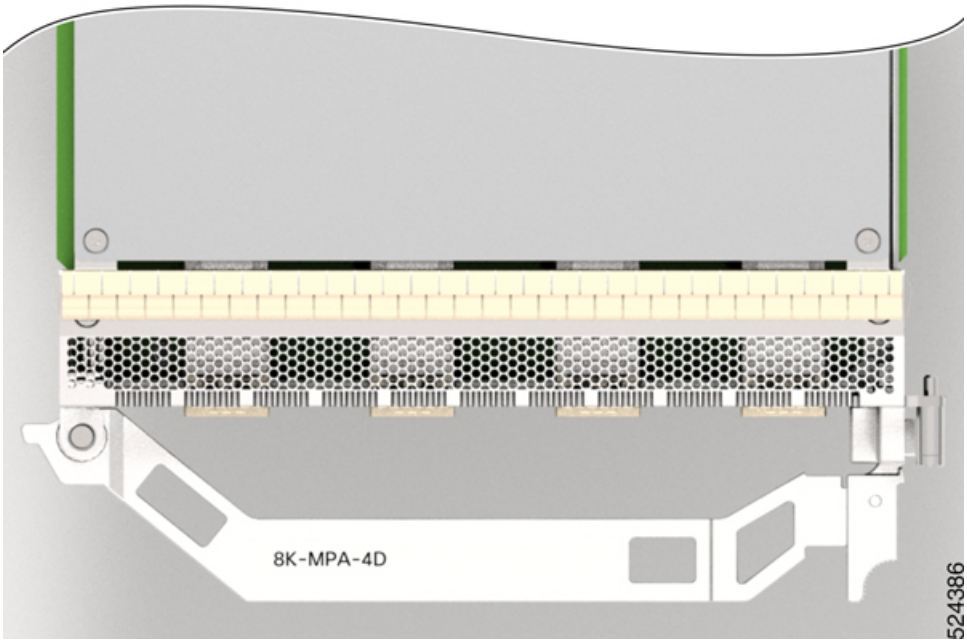
The following image explains the port details of the MPA:

Figure 5: 8K-MPA-4D Port Details



1	QSFP-DD (Ports 0, 1, 2, and 3)

Figure 6: 8K-MPA-4D Handle

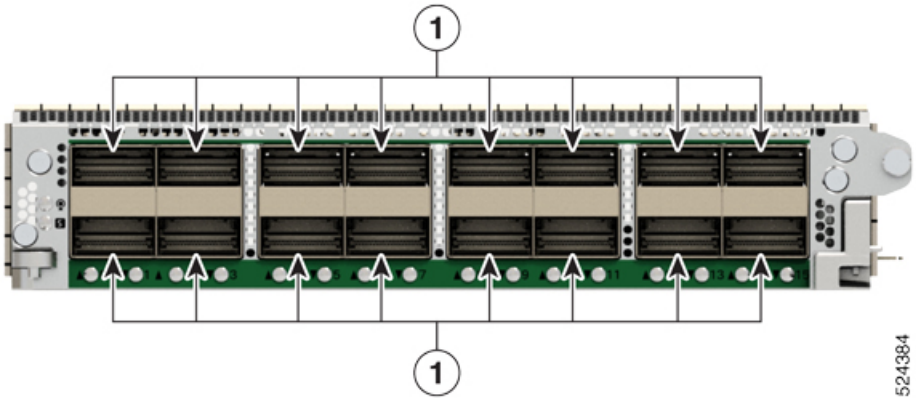


The 8K-MPA-4D is a pluggable card that provides 4 interface ports that can support QSFP-DD 400GbE, 200GbE, or 100GbE modules

8K-MPA-16H

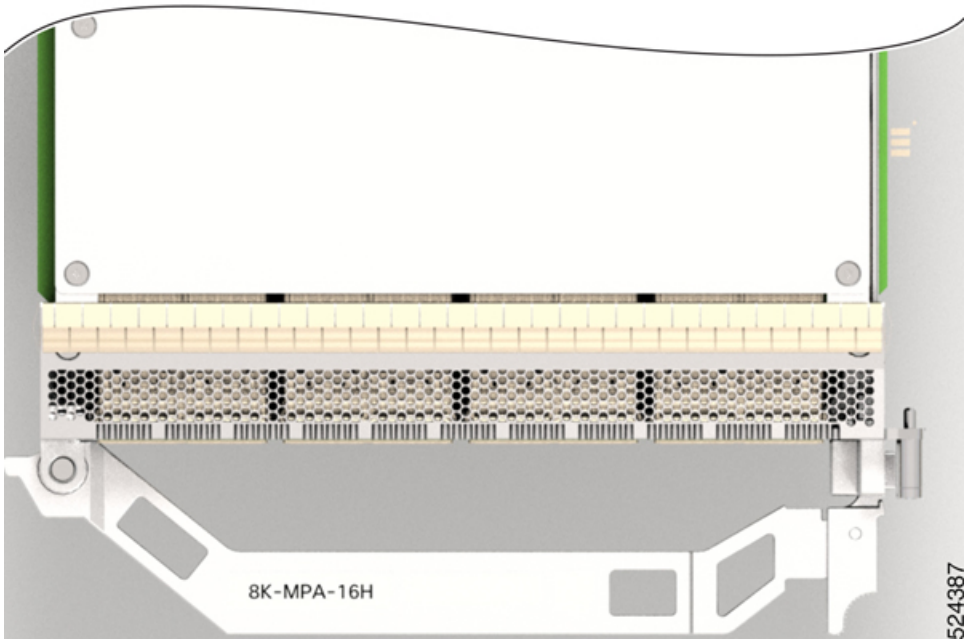
The following image displays the MPA PID and explains the port configuration details of the MPA:

Figure 7: 8K-MPA-16H Port Details



1	QSFP28 100G (Ports 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15)

Figure 8: 8K-MPA-16H Handle

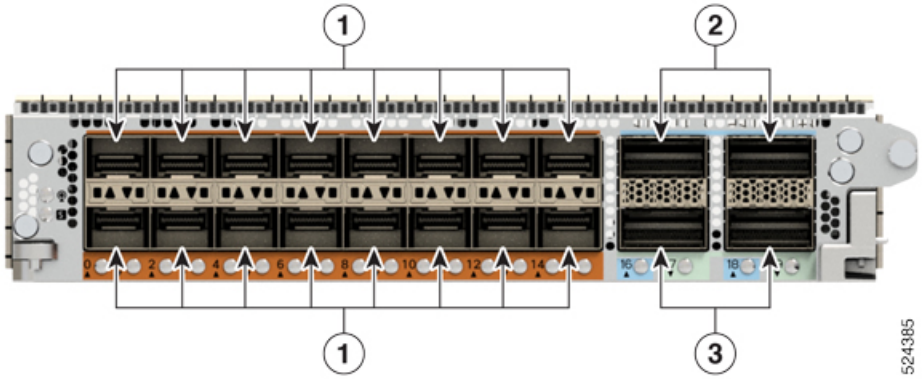


The 8K-MPA-16H is a pluggable card that provides 16 interface ports that supports QSFP-28 100GbE module.

8K-MPA-16Z2D

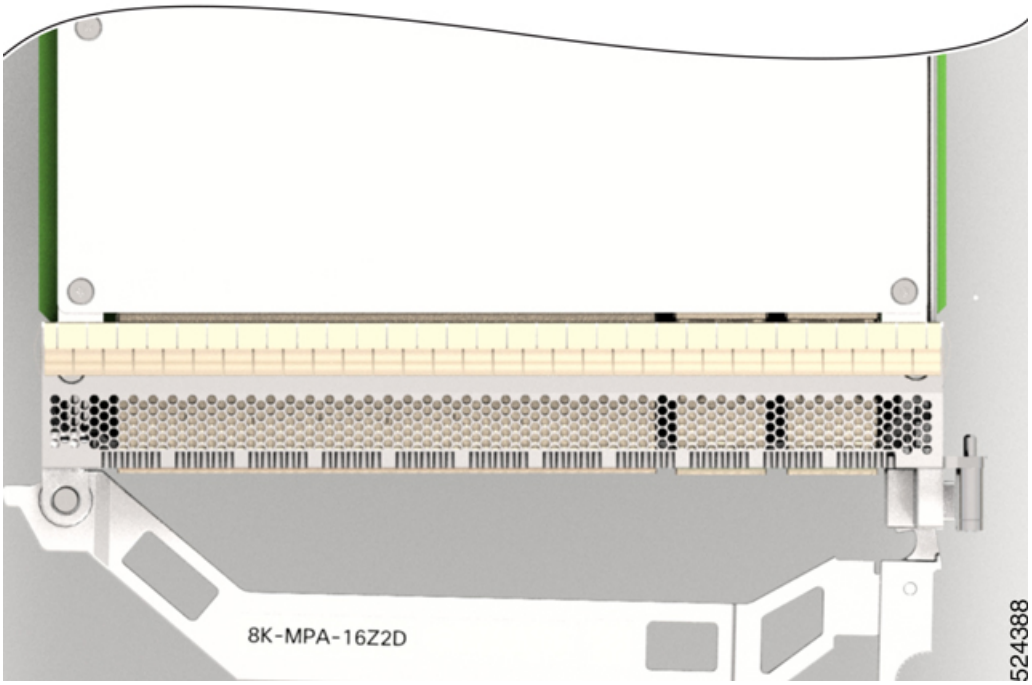
The following image displays the MPA PID and explains the port details of the MPA:

Figure 9: 8K-MPA-16Z2D



1	SFP 50GbE, 25GbE, 10GbE, or 1GbE (Ports 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15)
2	QSFP-DD 400GbE, 200GbE, or 100GbE (Ports 16 and 18)
3	QSFP-DD 200GbE or 100GbE (Ports 17 and 19)

Figure 10: 8K-MPA-16Z2D Handle



The 8K-MPA-16Z2D is a pluggable card that provides 20 interface ports that can support up to:

- 4 ports of QSFP-DD and 16 ports of SFP
- 16 ports (0-15) of SFP 50GbE, 25GbE, 10GbE, or 1GbE modules
- 2 ports (16 and 18) of QSFP-DD 400GbE, 200GbE, or 100GbE modules
- 2 ports (17 and 19) of QSFP-DD 200GbE or 100GbE modules

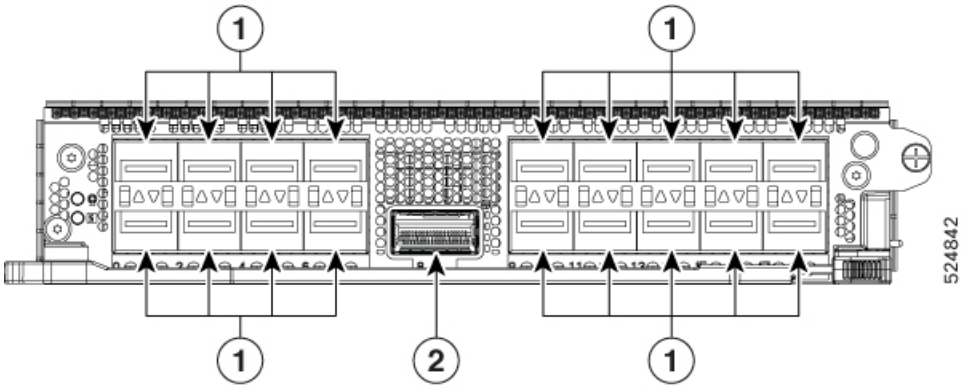
When port 16 and 18 has a 400G QSFP-DD, then the other two ports (17 and 19) cannot be used.

Note The 8K-MPA-16Z2D MPA does not support auto-negotiation when using the 400G optics.

8K-MPA-18Z1D

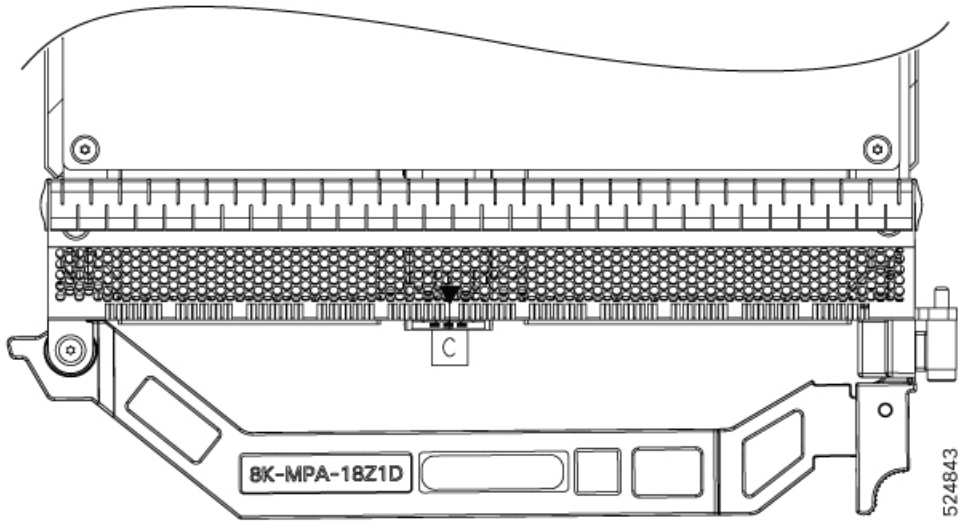
The following image displays the MPA PID and explains the port details of the MPA:

Figure 11: 8K-MPA-18Z1D



1	zSFP56+ 50GbE, 25GbE, 10GbE or 1GbE (Ports 0, 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18)
2	QSFP-DD 400G-ZR/ZR+, 400GbE, 4x100GbE, 2x100GbE, 100G-ZR+/100G-ZR, 100GbE, 4x25GbE, 40GbE, or 4x10GbE (Port 8)

Figure 12: 8K-MPA-18Z1D Handle



The 8K-MPA-18Z1D is a pluggable card that provides 19 interface ports that can support up to:

- An overall throughput of 1.3T of Tbps
- 1 port of QSFP-DD and 18 ports of zSFP56+
- 1 port (Port 8) of QSFP-DD 400G-ZR/ZR+, 400GbE, 4x100GbE, 2x100GbE, 100G-ZR+/100G-ZR, 100GbE, 4x25GbE, 40GbE, or 4x10GbE modules
- 18 ports (Ports 0-7 and 9-18) of zSFP56+ 50GbE, 25GbE, 10GbE or 1GbE modules
- PTP Timing with Class C performance

Note You can only perform consecutive MPA reloads in Cisco 8700 Series Routers after the MPA has been operational for a few minutes following the first reload. Reloading the MPA again without waiting may result in abnormal failures of the subsequent reload.

Temperature and Physical Specifications

For temperature and physical specifications, refer to the *Physical characteristics* table in the *Cisco 8700 Router Data Sheet*.

Weight and Power Consumption

For weight and power consumption, refer to the *Physical characteristics* table in the *Cisco 8700 Router Data Sheet*.

Airflow Direction

The Cisco 8700 series routers support these configurations:

- Post-Side Intake (PSI) configuration - the airflow through both the fan trays and power supplies is from the front-side to the rear-side. In PSI configuration, the power and fan modules are in Burgundy color.
- Post-Side Exhaust (PSE) configuration - the airflow through both the fan trays and power supplies is from the rear-side to the front-side. In PSE configuration, the power and fan modules are in Cisco Safety Blue color.

Figure 13: Airflow Direction for Cisco 8711-32FH-M Router in PSI Configuration

Figure 14: Airflow Direction for Cisco 8711-32FH-M Router in PSE Configuration

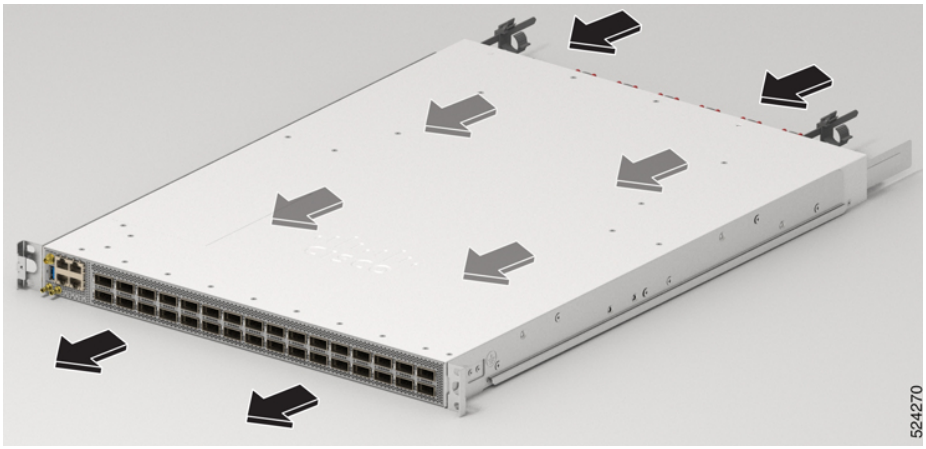


Figure 15: Airflow Direction for Cisco 8712-MOD-M Router in PSI Configuration

Figure 16: Airflow Direction for Cisco 8712-MOD-M Router in PSE Configuration

To ensure proper airflow for the router in your facility, position the router with its air intake on a cold aisle and the air exhaust on a hot aisle.

Note The airflow direction must be the same for all power supply and fan modules in the chassis.

Maximum Power Available to Router

The maximum power available to the router depends on the following factors:

- the input power from the power source
- the number of Power Supply Units (PSUs)
- the output capabilities of the PSUs
- the power redundancy mode

The following table lists the amount of power available for Cisco 8700 series routers from all available power trays.

Table 5: Maximum Power Available

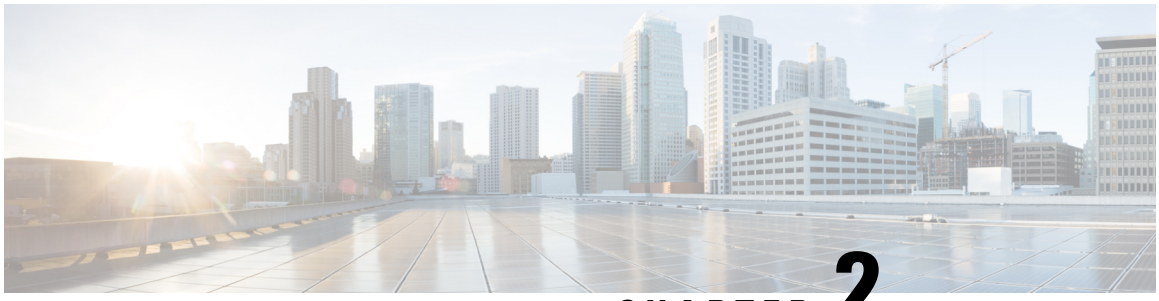
Number of PSUs	Combined Mode (No redundancy)	1+1 Redundancy Mode (with Single Supply Loss)
1	2KW	—
2	4KW	2KW

Note In Cisco 8700 series routers, when the AC power supply unit operates at the low line voltage range of 90VAC to 140VAC, the router does not support 1+1 redundancy mode. The low line voltage maximum power per AC power supply unit is 1KW. Thus, the total power of two AC power supply units at the low line voltage is 2KW. Therefore, you must have two AC power supply units for the router to operate at low line voltage.

Supported Optics

Note To determine which transceivers and cables are supported by this router, refer to the Transceiver Module Group (TMG) Compatibility Matrix Tool:

https://tmgmatrix.cisco.com/



CHAPTER 2

Prepare for Installation

This chapter provides preinstallation information, such as recommendations and requirements that must be met before installing your switch. Before you begin, inspect all items for shipping damage. If anything appears to be damaged or if you encounter problems installing or configuring your switch, contact customer service.

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

Standard Warning Statements

This section describes the warning definition and then lists core safety warnings grouped by topic.

General Safety Warnings

Warning **Statement 1089**—Instructed and Skilled Person Definitions

An instructed person is someone who has been instructed and trained by a skilled person and takes the necessary precautions when working with equipment.

A skilled person or qualified personnel is someone who has training or experience in the equipment technology and understands potential hazards when working with equipment.

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Warning **Statement 9001**—Product Disposal

Ultimate disposal of this product should be handled according to all national laws and regulations.

Warning **Statement 1073**—No User-Serviceable Parts

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Warning **Statement 1074**—Comply with Local and National Electrical Codes

To reduce risk of electric shock or fire, installation of the equipment must comply with local and national electrical codes.

Note **Statement 407**—Japanese Safety Instruction

You are strongly advised to read the safety instruction before using the product.

https://www.cisco.com/web/JP/techdoc/pldoc/pldoc.html

When installing the product, use the provided or designated connection cables/power cables/AC adapters.

〈製品仕様における安全上の注意〉
www.cisco.com/web/JP/techdoc/index.html

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Note **Statement 438**—Taiwan RoHS

Restricted Substances Content Disclosure Table web address: http://www.cisco.com/go/taiwanrohs

Warning **Statement 445—**Connect the Chassis to Earth Ground

To reduce the risk of electric shock, connect the chassis of this equipment to permanent earth ground during normal use.

Warning **Statement 1015—**Battery Handling

To reduce risk of fire, explosion, or leakage of flammable liquid or gas:

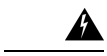
- Replace the battery only with the same or equivalent type recommended by the manufacturer.
- Do not dismantle, crush, puncture, use a sharp tool to remove, short the external contacts, or dispose of the battery in fire.
- Do not use if battery is warped or swollen.
- Do not store or use battery in a temperature > .
- Do not store or use battery in low air pressure environment < .

Warning **Statement 1020—**Electrical Power Outlet with Grounding

In accordance with the ABNT NBR 5410 Electrical Installation Standard, this equipment must be connected to an electrical power outlet that has grounding (three pins), which protects the user against electric shocks.

Warning **Statement 1029—**Blank Faceplates and Cover Panels

Blank faceplates and cover panels serve three important functions: they reduce the risk of electric shock and fire, they contain electromagnetic interference (EMI) that might disrupt other equipment, and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.



Warning **Statement 1057—**Hazardous Radiation Exposure

Use of controls, adjustments, or performance of procedures other than those specified may result in hazardous radiation exposure.

Warning **Statement 1062—**Remove Power Before Disconnecting

Explosion Hazard—Do not connect or disconnect any connector to this equipment unless power has been removed or you have verified that the area is nonhazardous. Secure any external connections that connect to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.

Warning **Statement 1071—**Warning Definition

IMPORTANT SAFETY INSTRUCTIONS

Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Read the installation instructions before using, installing, or connecting the system to the power source. Use the statement number at the beginning of each warning statement to locate its translation in the translated safety warnings for this device.

SAVE THESE INSTRUCTIONS

Warning **Statement 1090—**Installation by Skilled Person

Only a skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of a skilled person.

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Warning **Statement 1091—**Installation by an Instructed Person

Only an instructed person or skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of an instructed or skilled person.

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Warning **Statement 1093—**Avoid Sharp Edges

Risk of personal injury. Avoid sharp edges when installing or removing replaceable units.

Note **Statement 8006—**CE Mark

Safety Guidelines

Before you perform any procedure in this document, review the safety guidelines in this section to avoid injuring yourself or damaging the equipment. The following guidelines are for your safety and to protect the equipment. Because the guidelines do not include all hazards, be constantly alert.

- Keep the work area clear, smoke and dust-free during and after installation. Do not allow dirt or debris to enter into any laser-based components.
- Do not wear loose clothing, jewelry, or other items that could get caught in the switch or other associated components.
- Cisco equipment operates safely when used in accordance with its specifications and product-usage instructions.
- If potentially hazardous conditions exist, do not work alone.
- Take care when connecting multiple units to the supply circuit so that wiring is not overloaded.
- This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain about whether suitable grounding is available.
- When installing or replacing the unit, the ground connection must always be made first and disconnected last.
- To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.
- Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.

Compliance and Safety Information

The Cisco 8000 Series Switches are designed to meet the regulatory compliance and safety approval requirements. For detailed safety information, see Regulatory Compliance and Safety Information—Cisco 8000 Series Routers.

Laser Safety

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 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 1255—**Laser Compliance Statement

Pluggable optical modules comply with IEC 60825-1 Ed. 3 and 21 CFR 1040.10 and 1040.11 with or without exception for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice No. 56, dated May 8, 2019.

Energy Hazard

The switches can be configured for a DC power source. Do not touch terminals while they are live. Observe the following warning to prevent injury.

Preventing Electrostatic Discharge Damage

Many switch components can be damaged by static electricity. Not exercising the proper electrostatic discharge (ESD) precautions can result in intermittent or complete component failures. To minimize the potential for ESD damage, always use an ESD-preventive antistatic wrist strap (or ankle strap) and ensure that it makes adequate skin contact.

Note Check the resistance value of the ESD-preventive strap periodically. The measurement should be 1–10 megohms.

Before you perform any of the procedures in this guide, attach an ESD-preventive strap to your wrist and connect the leash to the chassis.

Cautions and Regulatory Compliance Statements for NEBS

The NEBS-GR-1089-CORE regulatory compliance statements and requirements are discussed in this section.

Note **Statement 7001—**ESD Mitigation

This equipment may be ESD sensitive. Always use an ESD ankle or wrist strap before handling equipment. Connect the equipment end of the ESD strap to an unfinished surface of the equipment chassis or to the ESD jack on the equipment if provided.

Warning **Statement 7003—** Shielded Cable Requirements for Intrabuilding Lightning Surge

The intrabuilding port(s) of the equipment or subassembly, which is the management Ethernet port, must use shielded intrabuilding cabling/wiring that is grounded at both ends.

Warning

Statement 7005— Intrabuilding Lightning Surge and AC Power Fault

The intrabuilding port(s) of the equipment or subassembly, which is the management Ethernet port, must not be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

Note

Statement 7011— Surge Protection Device Requirements for GR-1089 Antenna Ports

Protect equipment antenna ports, that are classified as Type 6 according to GR-1089-CORE, with lightning surge protectors that are rated at a minimum of 600 V peak surge of 1.2/50 uS duration.

Connecting a Cable to the GNSS Antenna Interface

- GNSS modules have built-in ESD protections on all pins, including the RF-input pin. However, additional surge protection is required if an outdoor antenna is being connected. The Lightning Protector must be able to provide a low clamping voltage (less than 600V).
- A lightning protection must be mounted at the place where the antenna cable enters the building. The primary lightning protection must be capable of conducting all potentially dangerous electrical energy to PE (Protective Earth).
- Surge arrestors should support DC-pass and suitable for the GPS frequency range (1.575GHz) with low attenuation.

Warning

Statement 7012—Equipment Interfacing with AC Power Ports

Connect this equipment to AC mains that are provided with a surge protective device (SPD) at the service equipment that complies with NFPA 70, the National Electrical Code (NEC).

Note

Statement 7013—Equipment Grounding Systems—Common Bonding Network (CBN)

This equipment is suitable for installations using the CBN.

Warning

Statement 7016— Battery Return Conductor

The battery return conductor of this equipment shall be treated as Isolated DC return (DC-I).

Note **Statement 7018—**System Recover Time

The equipment is designed to boot up in less than 30 minutes provided the neighboring devices are fully operational.

Note **Statement 8015—**Installation Location Network Telecommunications Facilities

This equipment is suitable for installation in network telecommunications facilities.

Note **Statement 8016—**Installation Location Where the National Electric Code (NEC) Applies

This equipment is suitable for installation in locations where the NEC applies.

Installation Guidelines

Before installing the chassis, ensure that the following guidelines are met:

- Site is properly prepared so that there is sufficient room for installation and maintenance.
- Operating environment is within the ranges that are listed in Environment and Physical specifications. For more details on environmental requirements, see *Cisco 8700 Router Data Sheet*.
- Chassis is mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting the chassis in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the chassis in the rack.
- Airflow around the chassis and through the vents is unrestricted.
- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures. Make sure that the cabling is safely away from other devices that might damage the cables.
- Each port must match the wave-length specifications on each end of the cable, and the cable must not exceed the stipulated cable length.

Note Cisco 8000 Series Routers function in operating temperatures of up to 40°C at sea level. For every 300 meters (1000 ft) elevation upto 1800 meters (6000 ft), the maximum temperature is reduced by 1°C. For more details on environmental requirements, see *Cisco 8700 Router Data Sheet*.

Procure Tools and Equipment

Obtain these necessary tools and equipment for installing the chassis:

- Number 1 and number 2 Phillips screwdrivers with torque capability to rack-mount the chassis.
- 3/16-inch flat-blade screwdriver.
- Tape measure and level.
- ESD wrist strap or other grounding device.
- Antistatic mat or antistatic foam.
- Two-hole ground lug (1).
- A crimping tool specified by the lug manufacturer that is large enough to accommodate the girth of the lug.
- Wire-stripping tool.
- Optical transceiver extraction tool.

Router Accessory Kits

Router Accessory Kit

The accessory kits for the Cisco 8700 series router includes the following:

Table 6: Router Accessory Kits - Cisco 8712-MOD-M

Kit Name	Kit PID	Description	Quantity
Rack mount kit for 4-post rack	NC57-2RU-ACC-KIT - 19 inch NC57-2RU-ACC-KIT3 - 23 inch	Slider assembly - left and right	2
		Slider brackets - left and right	2
		12-24 Phillips pan-head screws	22
		M4 x 5.7-mm Phillips flat head screws	22
		Bracket mounting adapter (available only 23-inch rack-mount kit)	4
		Ground lug	1

Kit Name	Kit PID	Description	Quantity
Rack mount kit for 2-post rack	NC57-2RU-ACC-KIT2 - 19 inch NC57-2RU-ACC-KIT4 - 23 inch	Slider assembly - left and right	2
		Slider brackets - left and right	2
		12-24 Phillips pan-head screws	20
		M4 x 5.7-mm Phillips flat head screws	26
		Bracket mounting adapter (available only 23-inch rack-mount kit)	4
		Ground lug	1

Table 7: Router Accessory Kits - Cisco 8711-32FH-M Router

Kit Name	Kit PID	Description	Quantity
Rack mount kit for 4-post rack	8700-1RU-4P-KIT	Slider brackets	2
		Slider assembly	2
		Bracket mounting adapter	4
		Cable management bracket	1
		M5 x 12.45-mm Phillips dome-head screws	24
		M5 x 7.93-mm Phillips dome-head screws	2
		M4 x 5.7-mm Phillips flat-head screws	14
		M4 x 20-mm Phillips dome-head screws	1
		M5 washer	2
		Ground lug	1
		Ground lug extension bracket	1

Kit Name	Kit PID	Description	Quantity
Rack mount kit for 2-post rack	8700-1RU-2P-KIT	Slider brackets	2
		Slider assembly	2
		Bracket mounting adapter	4
		Cable management bracket	1
		M5 x 12.45-mm Phillips dome-head screws	22
		M5 x 7.93-mm Phillips dome-head screws	2
		M4 x 5.7-mm Phillips flat-head screws	14
		M4 x 20-mm Phillips dome-head screws	1
		M5 washer	2
		Ground lug	1
		Ground lug extension bracket	1

Note If you purchased this product through a Cisco reseller, you might receive more contents in your kit, such as documentation, hardware, and power cables.

The shipped cables depend on your specification when placing an order. See the *Power Supply Power Cord Specifications* section for information on the available power cords.

Discrepancies or Damage?

If you notice any discrepancies or damage, send the following information to your customer service representative by email:

- Invoice number of the shipper (see the packing slip)
- Model and serial number of the missing or damaged unit
- Description of the problem and how it affects the installation
- Photos of the damage to external packaging, internal packaging, and product

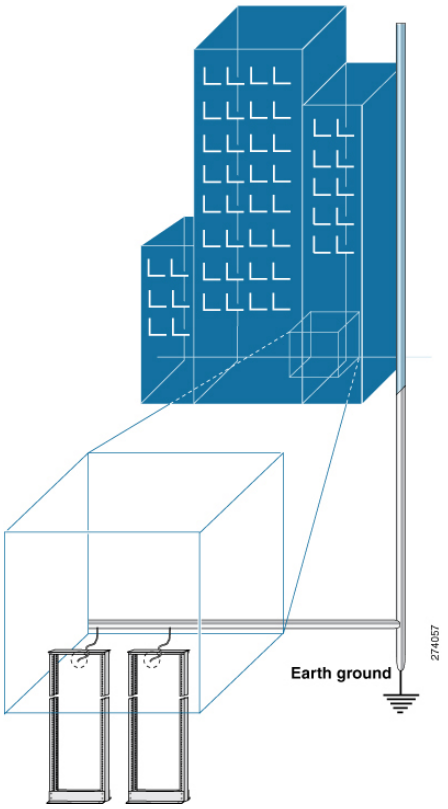
Prepare Your Location

This section illustrates how the building that houses the chassis must be properly grounded to the earth ground.

Note Unless specified otherwise, the image is only for representational purposes. The rack's actual appearance and size may vary.

Note This image is only for representational purposes. Your grounding requirement depends on your building.

Figure 17: Building with Rack Room Connected to Earth Ground



Airflow for Site Planning

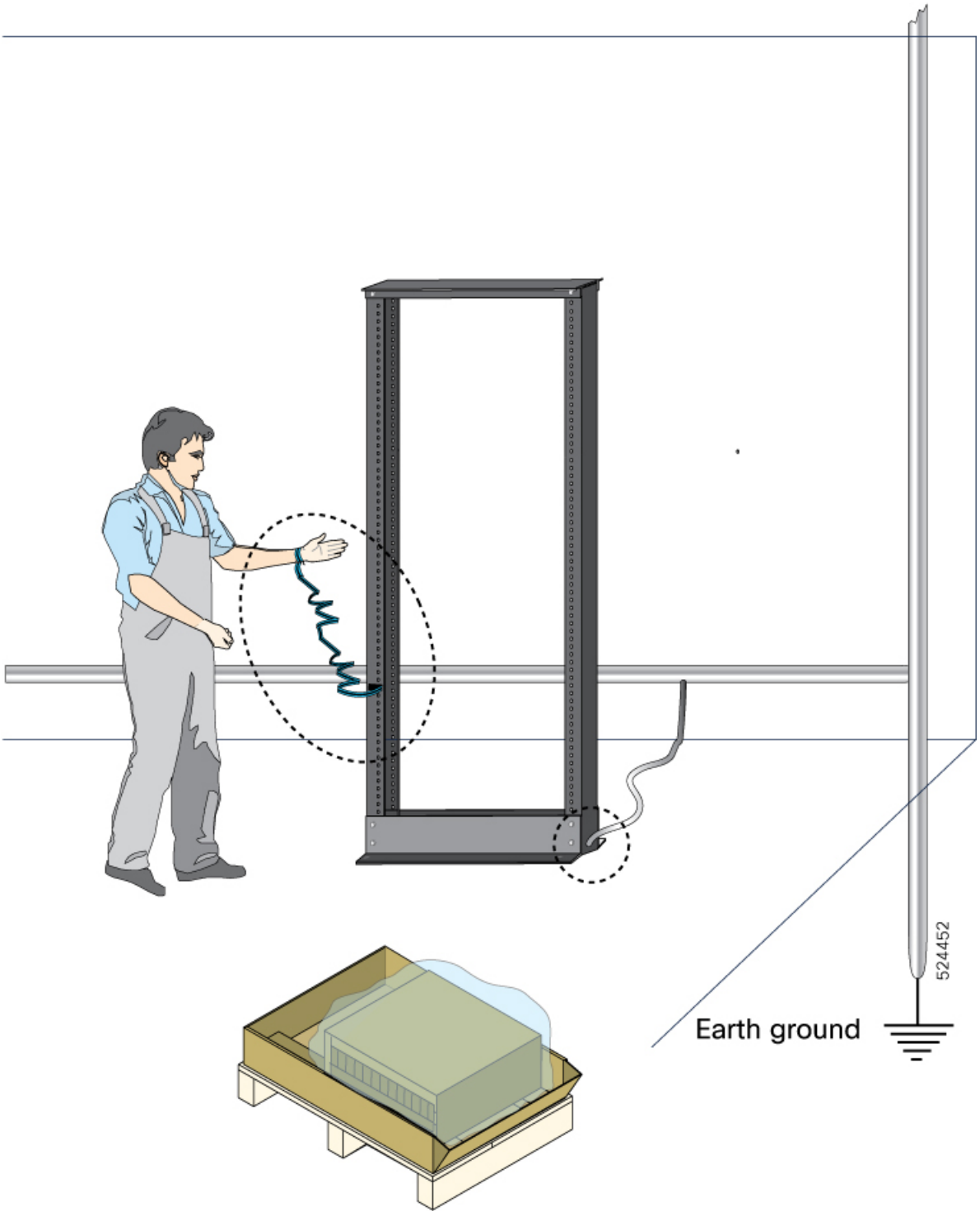
Table 8: Cisco 8700 Airflow

Device	Maximum System Airflow (CFM) at Maximum System Temperature
Cisco 8712-MOD-M	370
Cisco 8711-32FH-M	160

Prepare Yourself

This section illustrates how to prepare yourself before removing the chassis from the sealed antistatic bag. The figures show how to cuff the ESD strap around the wrist and the ground cord that connects the cuff to the ground. ESD wrist straps are the primary means of controlling static charge on personnel.

Figure 18: Wearing the ESD Strap



Prepare Rack for Chassis Installation

Install the Cisco 8700 Series Routers on a standard 19 inch or 23 inch, Electronic Industries Alliance (EIA) rack with mounting rails that conform to English universal hole spacing according to Section 1 of the ANSI/EIA-310-D-1992 standard.

Note The Cisco 8700 router rack mount kit contains the slider brackets for 19-inch rack. To install the chassis in a 23-inch rack or an ETSI rack, you need the bracket mounting adapter to accommodate the 19-inch rack mount brackets.

The spacing between the posts of the rack must be (EIA-310-D-1992 19-inch rack compatible) wide enough to accommodate the width of the chassis.

Figure 19: Rack Specification EIA (19 inches and 23 inches)

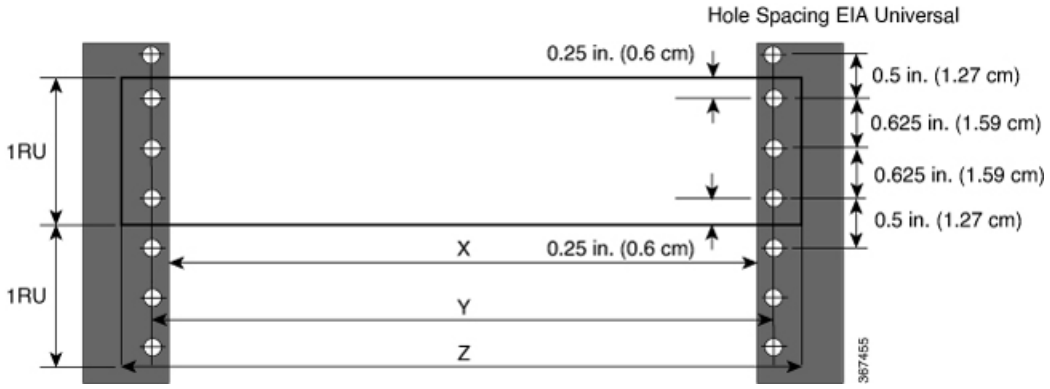


Table 9: Rack specification EIA (19 inches and 23 inches)

Post Type	Rack Type	Rack Front Opening (X)	Rack Mounting Hole Centre-Centre (Y)	Mounting Flange Dimension (Z)
4 Post	19 inches (48.3 centimeters)	450.8mm (17.75”)	465mm (18.312”)	482.6mm (19”)
2 Post				
4 Post	23 inches (58.4 centimeters)	552.45mm (21.75”)	566.7mm (22.312”)	584.2mm (23”)
2 Post				

Before you move the chassis or mount the chassis into the rack, we recommend that you do the following:

Procedure

Step 1 Place the rack at the location where you plan to install the chassis.

Step 2 (Optional) Secure the rack to the floor.

To bolt the rack to the floor, a floor bolt kit (also called an anchor embedment kit) is required. For information on bolting the rack to the floor, consult a company that specializes in floor mounting kits (such as Hilti; see Hilti.com for details). Ensure that floor mounting bolts are accessible, especially if annual retorquing of bolts is required.

Note
Ensure that the rack in which the chassis is being installed is grounded to earth ground.

Clearance Requirements

To ensure adequate airflow, we recommended that you maintain a minimum of 6 in. (15.24 cm) front and rear clearance for air intake/exhaust at room temperature up to 55C, and maintain a minimum of 4.0 in. (10.16 cm) front and rear clearance for air intake/exhaust at room temperature up to 40C. Leave an additional 6.0 in. (15.24 cm)/4.0 in. (10.16 cm) rear clearance for removal and installation of power supplies and fan modules.

If the router is installed in a perforated door cabinet, maintain a minimum of 6 in. (15.24 cm) from the inside of the door. The front and rear doors of the cabinet must be perforated with a minimum open area of 70%.

This figure shows the clearances required for the installation of Cisco 8700 Series Routers.

Figure 20: Clearances Required Around the Chassis - Cisco 8711-32FH

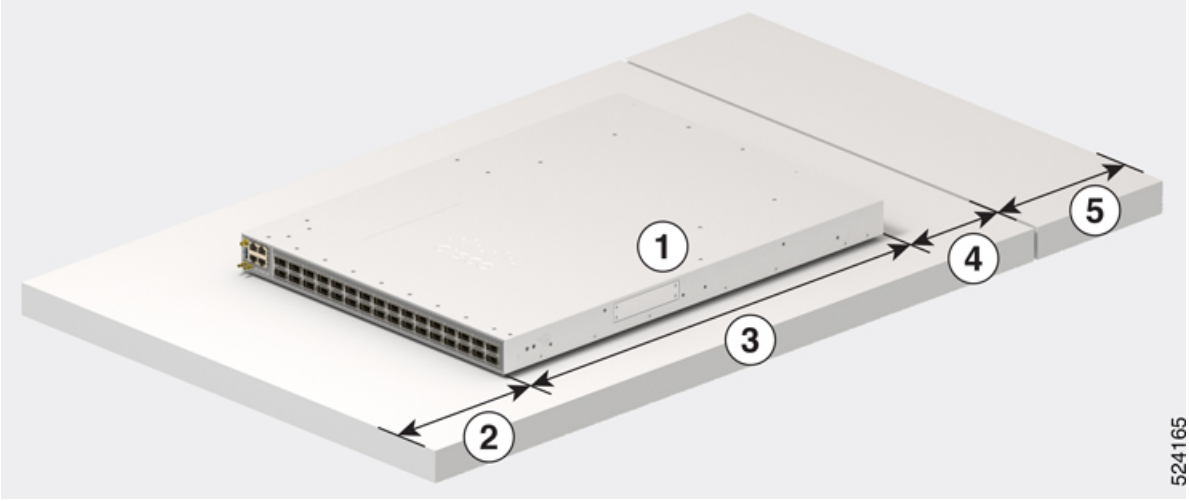
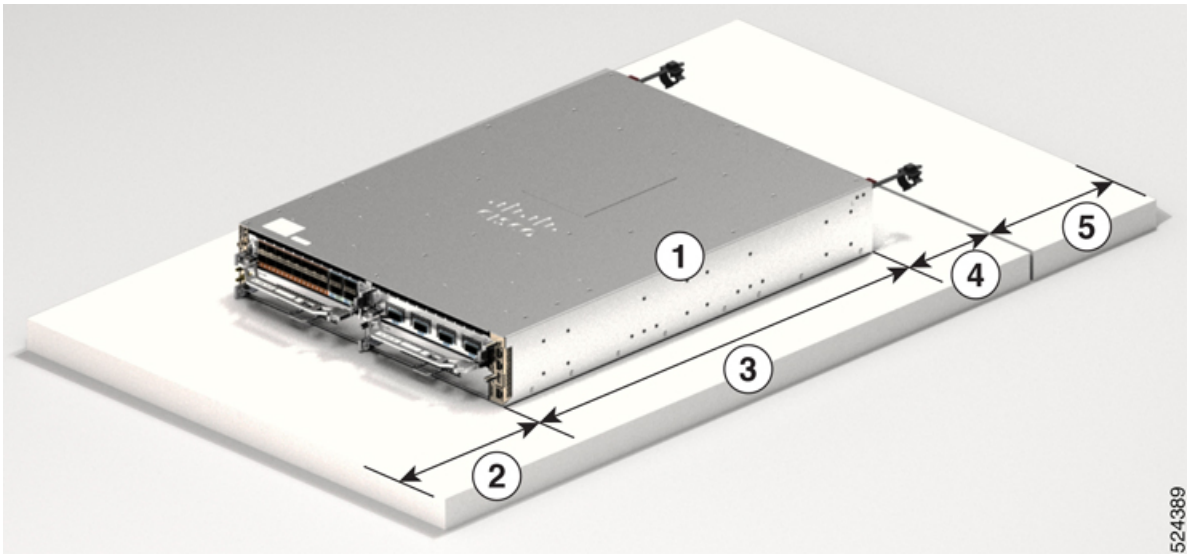
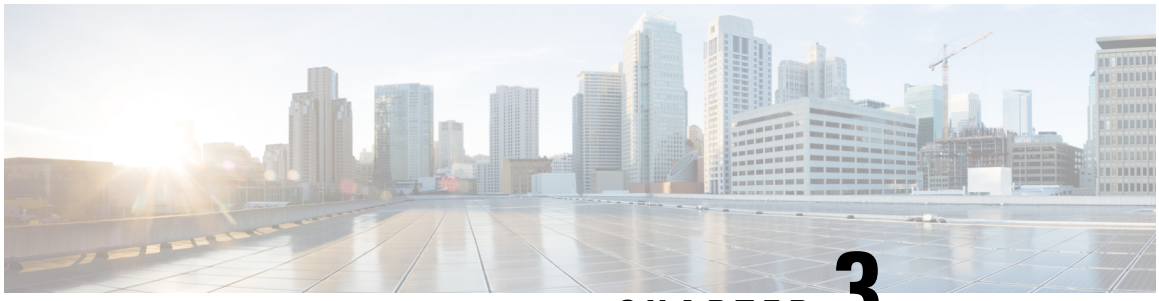


Figure 21: Clearances Required Around the Chassis - Cisco 8712-MOD-M



1	Chassis	4	• 6.0 in. (15.24 cm) front clearance for air intake/exhaust at room temperature up to 55C • 4.0 in. (10.16 cm) front clearance for air intake/exhaust at room temperature up to 40C
2	• 6.0 in. (15.24 cm) front clearance for air intake/exhaust at room temperature up to 55C • 4.0 in. (10.16 cm) front clearance for air intake/exhaust at room temperature up to 40C	5	Rear service area for the fan and power modules replacement
3	Chassis depth		



CHAPTER 3

Unpack and Install the Chassis

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

Install the Bracket Mounting Adapter on 23-inch Rack Post

To install a chassis on a 23-inch 4-post or 2-post rack, you must first install the bracket mounting adapter on the rack. Perform these steps to install the bracket mounting adapter:

Rack Mount Kit

- 4 Post: NC57-2RU-ACC-KIT3
- 2 Post: NC57-2RU-ACC-KIT4

Procedure

Mount the Bracket mounting adapter on the 23-inch rack post. Use three 12-24 Phillips pan-head screws with 30 in-lb (3.39 N.m) to attach each Bracket mounting adapter to the rear and front rack post on either sides.

Figure 22: Mount Bracket Mounting Adapter on a 23-inch 2-Post Rack

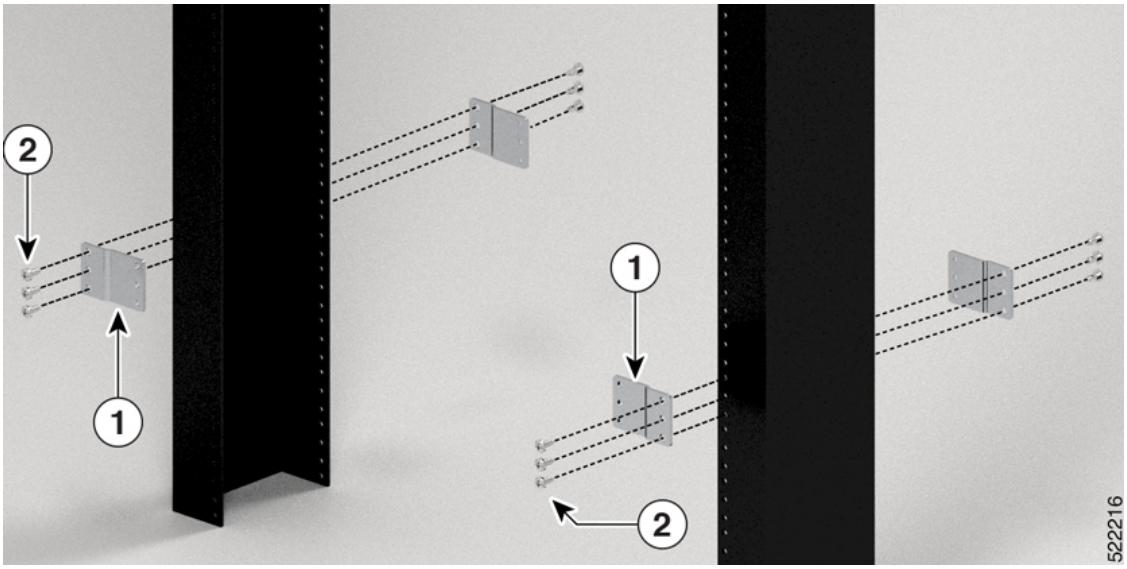
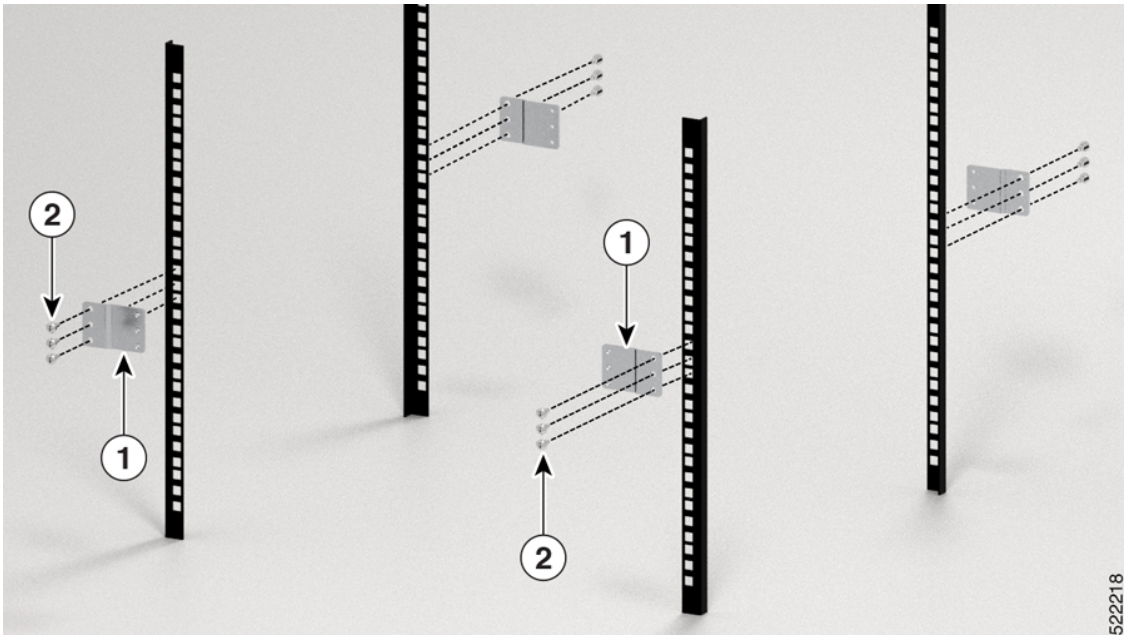


Figure 23: Mount Bracket Mounting Adapter on a 23-inch 4-Post Rack



1	Bracket mounting adapter	2	Screws

What to do next

Continue with the installation of the router by referring to the procedures for the 19-inch rack post.

Install Bottom-Support Rails

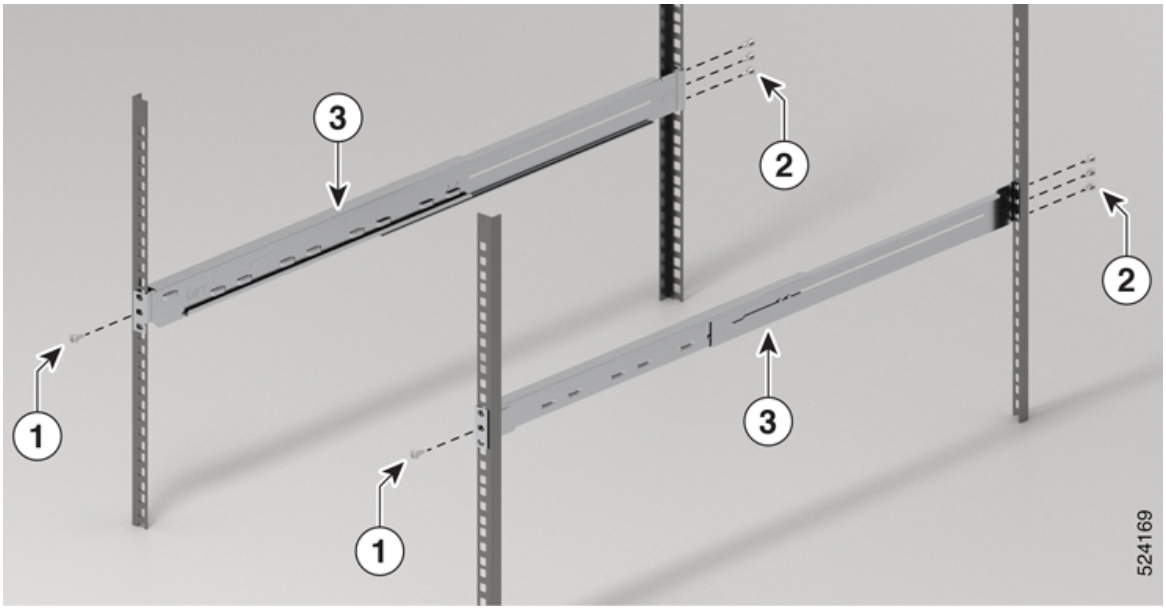
The bottom-support rails support the weight of the router chassis in the rack. To maximize the stability of the rack, you must attach these rails at the lowest possible rack unit (RU).

Procedure

Step 1 Position the vertical rack rails at 32" depth to match with the length of the bottom-support rails. Check spacing considerations.

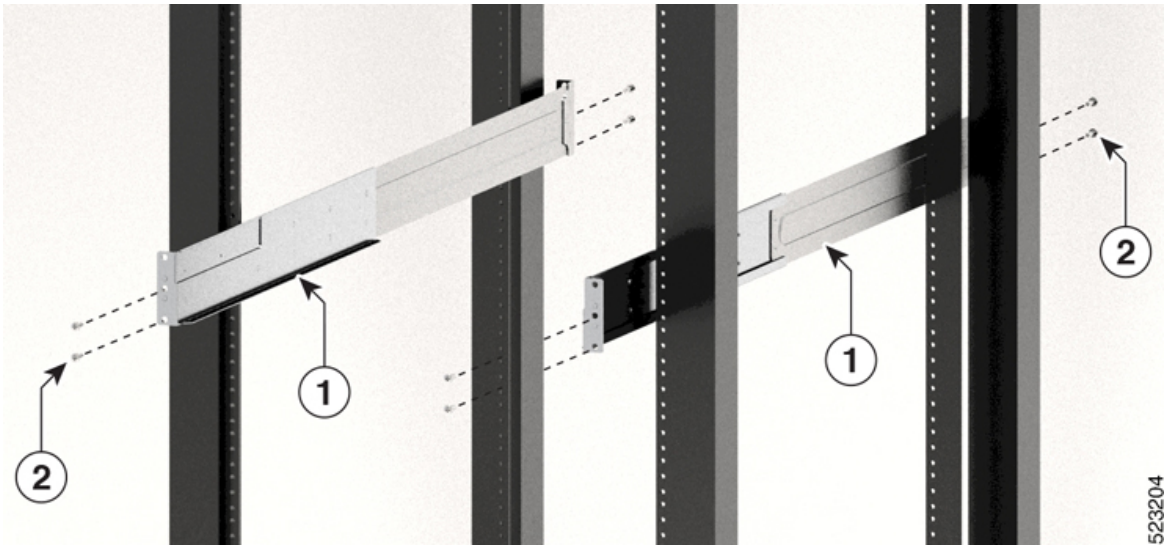
Step 2 Attach the bottom-support rail to the rack by using a Phillips torque screwdriver. Use an equivalent M5 x 12.45 mm or 12-24 x 1/2 inch screws for each end of the buttom-support rails and tighten each screw to 40 in-lbs (4.5 N-m) of torque.

Figure 24: Attach Bottom-Support Rails to Rack for Cisco 8711-32FH Router



1	M5 x 6-mm Phillips flat-head screws on the front (2)
2	M5 x 6-mm Phillips flat-head screws on the rear (6)
3	Bottom-support rails

Figure 25: Attach Bottom-Support Rails to Rack for Cisco 8712-MOD-M Router



1	Bottom-support rails
2	M4 x 6-mm Phillips flat-head screws (8)

Use two screws on each end of each bottom-support rail.

Step 3 Repeat Steps 1 and 2 to attach the other bottom-support rail to the rack.

Note
Ensure that the two bottom-support rails are level with one another. If they are not level, adjust the higher rail down to the level of the lower rail.

Rack Mount the Chassis

The chassis can be mounted on a 4-post or a 2-post rack.

Warning **Statement 1032—**Lifting the Chassis

To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules, such as power supplies, fans, or cards. These types of handles are not designed to support the weight of the unit.

Warning

Statement 1006—Chassis Warning for Rack-Mounting and Servicing

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Warning

Statement 1096—Headset Warning

High Sound Pressure—Avoid listening to high volume levels for long periods to prevent possible hearing damage.

Warning

Statement 1098—Lifting Requirement

people are required to lift the heavy parts of the product. To prevent injury, keep your back straight and lift with your legs, not your back.

Note

Statement 4023—Product Usage Restrictions

This product is designed for indoor usage only. Outdoor usage is not permitted.

Mount Cisco 8711-32FH-M Router in a 2-Post Rack with Sliders

This section describes how to use the rack-mount kit provided with the 8711-32FH-M router, to install the chassis into a cabinet or a 2-post 19-inch rack.

Caution

If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

For a complete list of items contained in the 2-post rack-mount kit (8700-1RU-2P-KIT) provided with the router, see Router Accessory Kits.

Before you begin

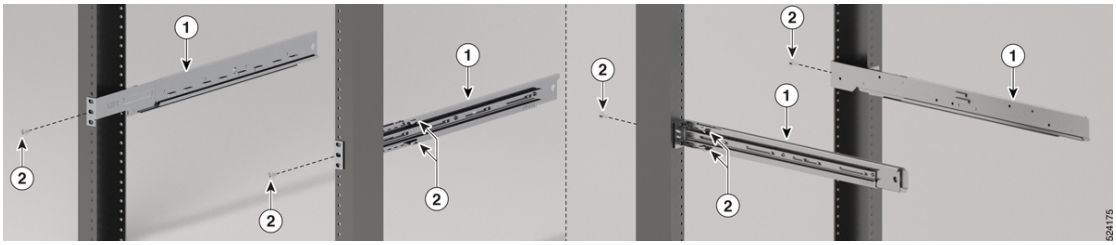
To install the router on a 23-inch rack, install the bracket mounting adapter on the 23-inch rack post (see Install the Bracket Mounting Adapter on 23-inch Rack Post) and then continue with this procedure.

Procedure

Step 1 Install the slider assembly on the rack as follows:

a) Align the left slider assembly to the rear post rack holes. The slider rail should be at the bottom.
b) Use four M5 12.45-mm Phillips dome-head screws with 27.44 in-lb (3.1 N-m) to attach the slider assembly to the rear post.
c) Repeat Steps 1a and 1b with the other slider assembly on the other side of the router.

Figure 26: Rack-Mount Slider Assembly on a 19-inch 2-Post Rack

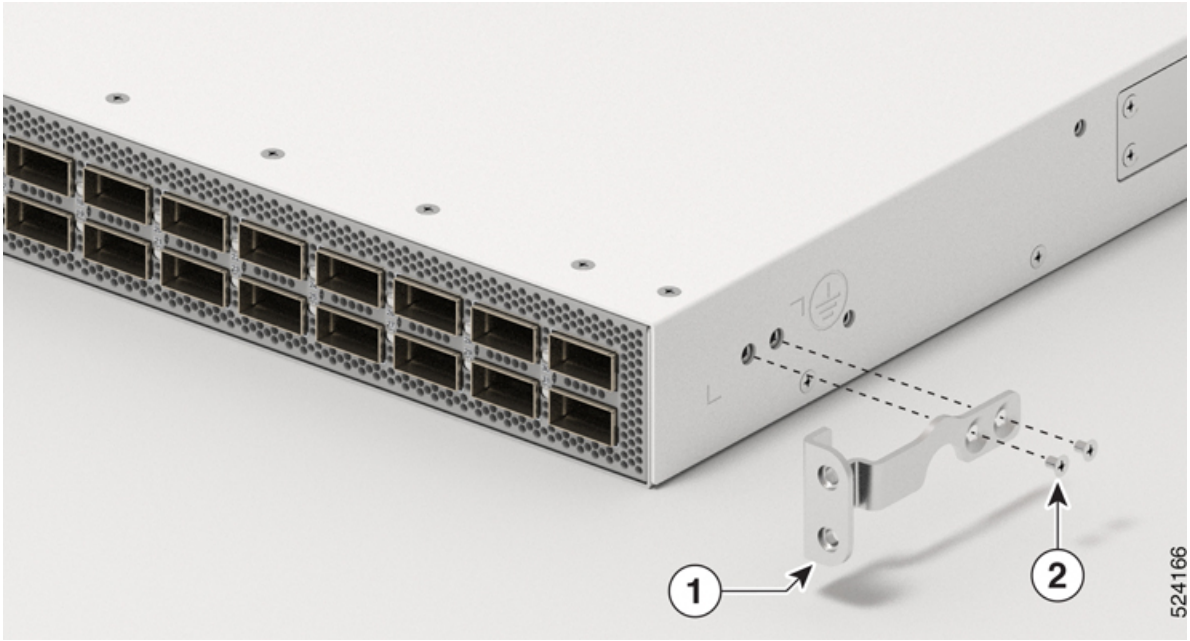


1	2 x M5 12.45-mm Phillips dome-head screws. One screw on each side. 4 x M5 12.45-mm Phillips dome-head screws on the rear side. Two screws on each side.	2	Slider assembly

Note
In case of a 23-inch 2-post rack, mount the slider assembly on the bracket mounting adapter following the same procedure outlined in Step 2.

Step 2 Install the ground lug extension bracket on the chassis. Use two M4 x 5.7-mm Phillips flat-head screws with 13.28 in-lbs (1.5 N-m).

Figure 27: Install the Ground Lug Extension Bracket on the Cisco 8711-32FH-M Router



1	Ground lug extension bracket	2	2 x M4 x 5.7-mm Phillips flat-head screws

Step 3 Install slider brackets to the router as follows:

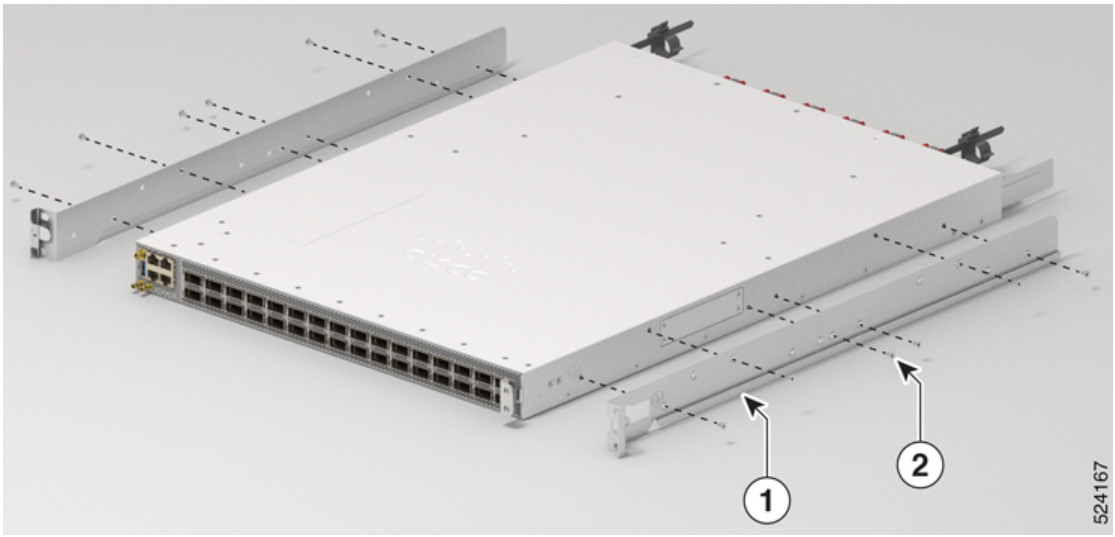
a) Determine which end of the chassis is to be located in the cold aisle as follows:

- If the router has port-side intake modules, position the router so that the ports are in the cold aisle.
- If the router has port-side exhaust modules, position the router so that the fan and power supply modules are in the cold aisle.

b) With the slider bracket ears aligned to the front of the chassis as shown in the image, use twelve M4 x 5.7 mm flat head screws with 13.28 in-lbs (1.5 N-m). to attach the bracket to the chassis.

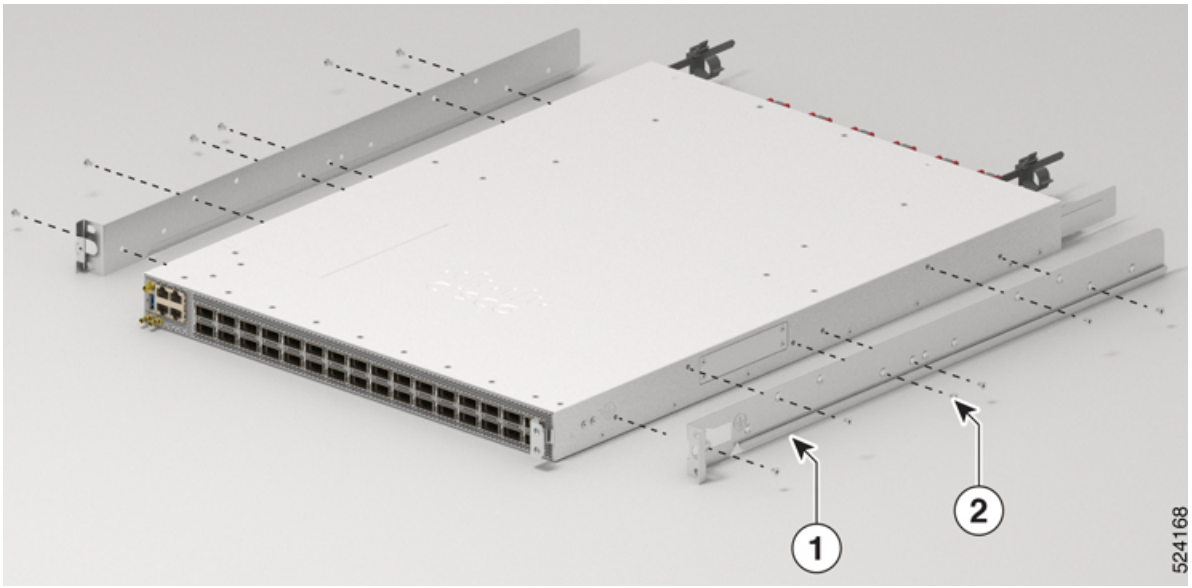
c) Repeat the step with the other slider bracket on the other side of the router.

Figure 28: Mount Slider Brackets in a 19-inch 2-Post Cisco 8711-32FH-M Router



Align the slider bracket with router face plate.

Figure 29: Mount Slider Brackets in a 19-inch 2-Post Cisco 8711-32FH-M Router along the Marking Line



Align the slider brackets with the marking line. Refer this image for marking line details.

1	Slider brackets	2	6 x M4 5.7-mm Phillips flat head screws on each side

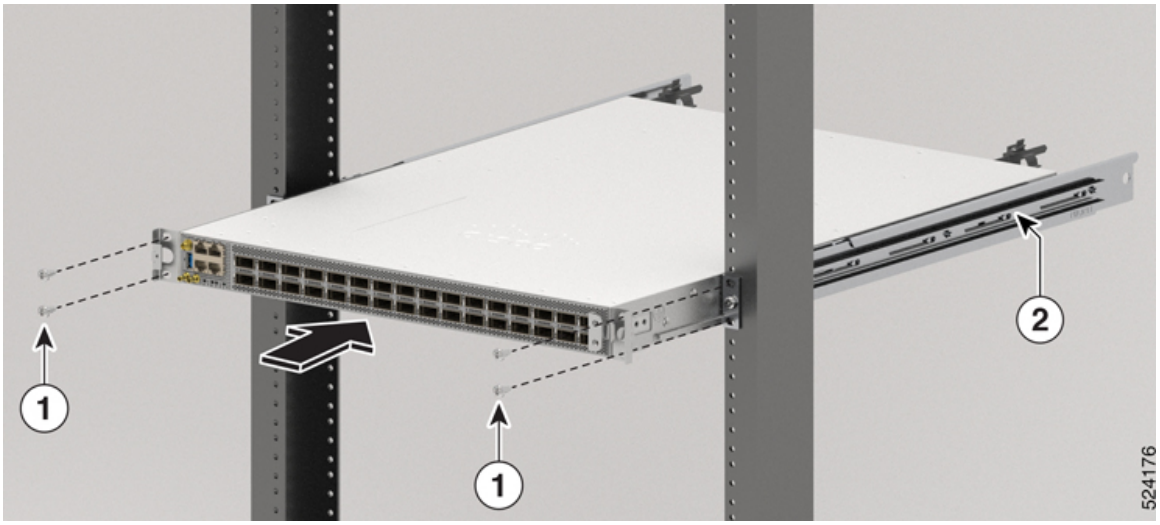
Step 4 Install the router onto the 2-post rack as follows:

a) Holding the router with both hands, position the back of the router between the front posts of the rack.

b) Move the router until the slider brackets come in contact with slider rails installed in the rack. Slide the slider brackets onto the slider rails, and then gently move the router all the way into the rack.

c) Hold the chassis level while the second person inserts six pan-head screws (M5) in each of the two rack-mount brackets (using a total of twelve screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails.
d) Tighten the M5 12.45-mm Phillips dome-head screws to 27.44 in-lb (3.1 N-m).

Figure 30: Slide the Chassis into the 19-inch 2-Post Rack



1	2 x M5 12.45-mm Phillips dome-head screws. Two screws on each side.
2	Slider assembly

Figure 31: Chassis Mounted into the 19-inch 2-Post Rack

Mount Cisco 8711-32FH-M Router in a 4-Post Rack with Sliders

This section describes how to use the rack-mount kit provided with the Cisco 8711-32FH-M router, to install the chassis into a cabinet or a 4-post 19-inch rack.

Caution If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

For a complete list of items contained in the 4-post rack-mount kit (8700-1RU-4P-KIT) provided with the router, see Router Accessory Kits.

Before you begin

To install the router on a 23-inch rack, install the bracket mounting adapter on the 23-inch rack post (see Install the Bracket Mounting Adapter on 23-inch Rack Post) and then continue with this procedure.

Procedure

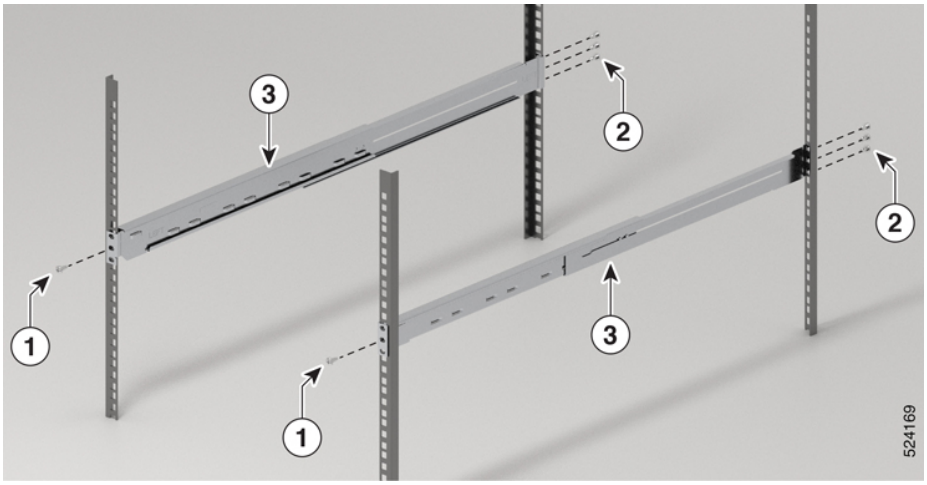
Step 1 Install the slider assembly on the rack as follows:

a) Align the outer slider of the left slider assembly to the rear post rack holes and the inner slider of the left slider assembly to the front post rack holes. The slider rail should be at the bottom.

b) Use four M5 12.45-mm Phillips dome-head screws (three on the rear side and one on the front side) with 27.44 in-lb (3.1 N-m) to attach the slider assembly to the rear and front rack post.

c) Repeat Steps 1a and 1b with the other slider assembly on the other side of the router.

Figure 32: Rack-Mount Slider Assembly on a 19-inch 4-Post Rack



1	Front screws – 2 x M5 12.45-mm Phillips dome-head screws. One screw on each side.	2	Rear screws – 6 x M5 12.45-mm Phillips dome-head screws. Three screws on each side.
3	Slider assembly		

Note
In case of a 23-inch 2-post rack, mount the slider assembly on the bracket mounting adapter following the same procedure outlined in Step 1.

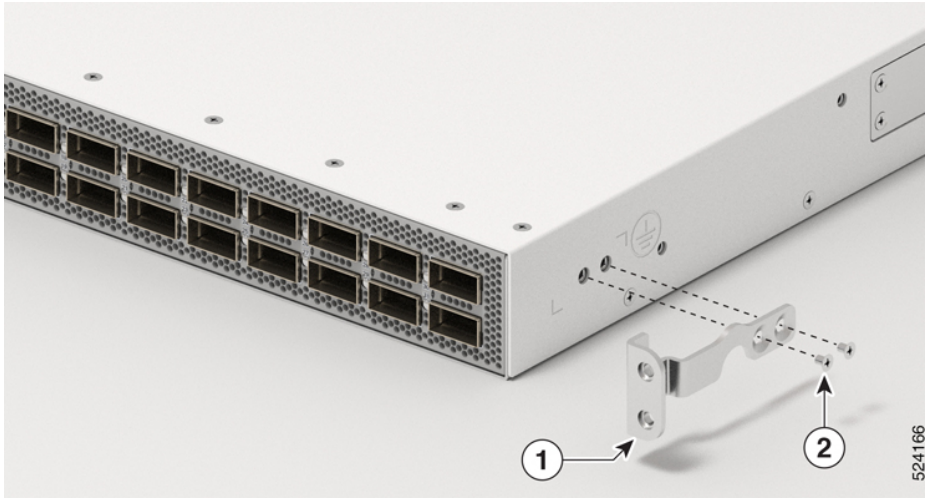
Step 2 Install slider brackets to the router as follows:

a) Determine which end of the chassis is to be located in the cold aisle as follows:

- If the router has port-side intake modules, position the router so that the ports are in the cold aisle.
- If the router has port-side exhaust modules, position the router so that the fan and power supply modules are in the cold aisle.

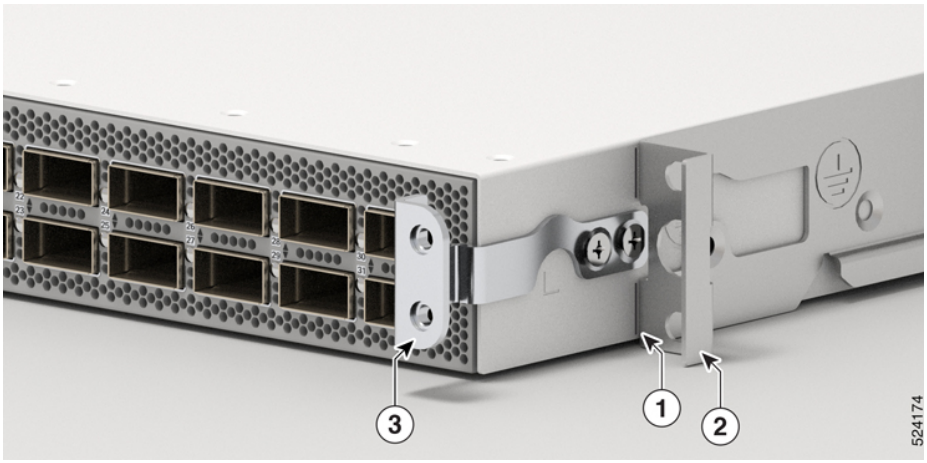
b) Install the ground lug extension bracket on the chassis. Use two M4 x 5.7-mm Phillips flat-head screws with 13.28 in-lbs (1.5 N-m).

Figure 33: Install the Ground Lug Extension Bracket on the Cisco 8711-32FH-M Router



1	Ground lug extension bracket	2	2 x M4 x 5.7-mm Phillips flat-head screws

Figure 34: Install the Ground Lug Extension Bracket Along Marking Line on a 19-inch 4-Post Cisco 8711-32FH-M Router

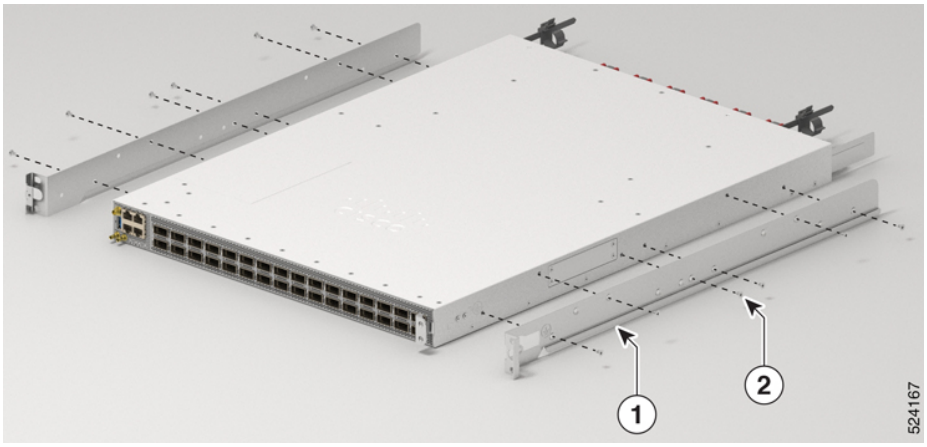


1	Marking line for alignment	2	Slider brackets
3	Ground lug extension bracket		

c) With the slider bracket ears aligned to the front of the chassis as shown in the image, use six M4 x 5.7-mm Phillips flat-head screws with 13.28 in-lbs (1.5 N-m) to attach the bracket to the chassis.

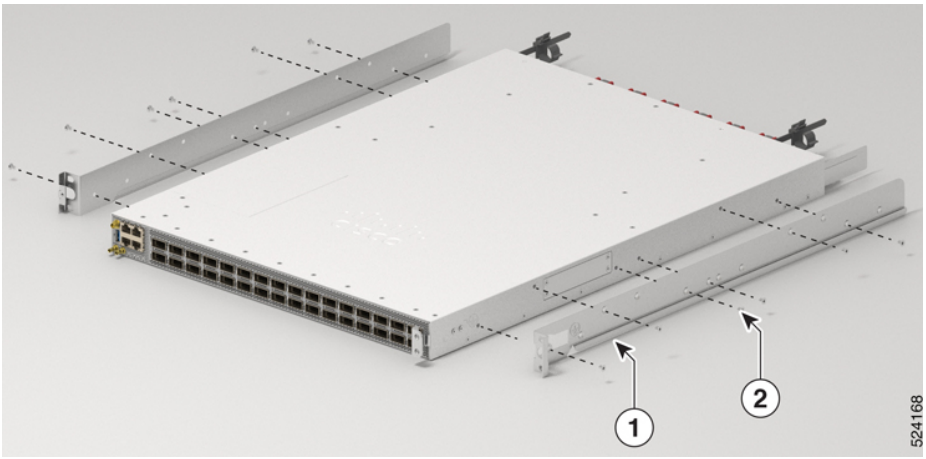
d) Repeat 2c with the other slider bracket on the other side of the router.

Figure 35: Mount Slider Brackets on the Cisco 8711-32FH-M Router



Align the slider bracket with router face plate.

Figure 36: Mount Slider Brackets on the Cisco 8711-32FH-M Router along the Marking Line



Align the slider brackets with the marking line. Refer this image for marking line details.

1	Slider bracket	2	6 x M4 x 5.7-mm Phillips flat- head screws on each side

Step 3 Install the router onto the 4-post rack as follows:

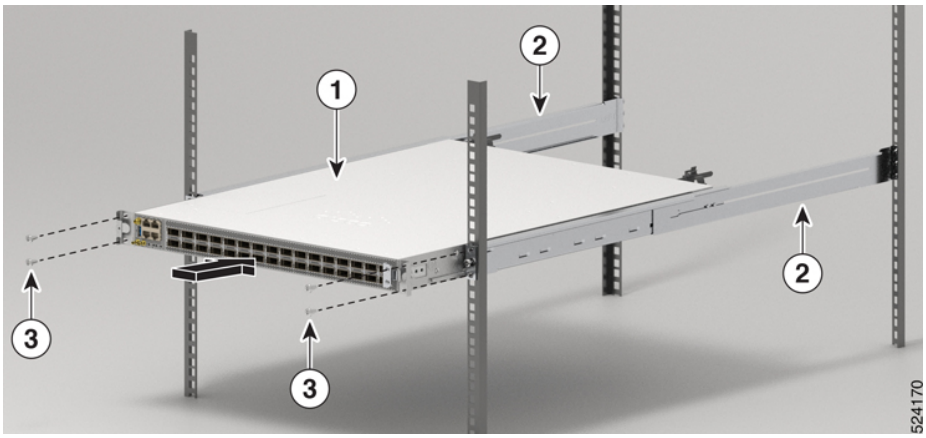
a) Holding the router with both hands, position the back of the router between the front posts of the rack.

b) Move the router until the slider brackets come in contact with slider rails installed in the rack. Slide the slider brackets onto the slider rails, and then gently move the router all the way into the rack.

c) Hold the chassis level while the second person inserts two screws M5 12.45-mm Phillips dome-head screws in each of the two rack-mount brackets (using a total of four screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails.

d) Tighten the M5 12.45-mm Phillips dome-head screw to 27.44 in-lb (3.1 N-m).

Figure 37: Slide the Cisco 8711-32FH-M Router in 19-inch 4-Post Rack



1	Chassis	3	4 x M5 12.45-mm Phillips dome-head screws. Two screws on each side.

2	Slider assembly		

Ground the Cisco 8711-32FH-M Router

Warning **Statement 1101—**Connected To Grounded Outlet

In the Scandinavian countries (Denmark, Finland, Iceland, Norway, and Sweden) the appliance must be connected to a grounded outlet.

Warning **Statement 1024—**Ground Conductor

This equipment must be grounded. To reduce the risk of electric shock, never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

Warning **Statement 1046—**Installing or Replacing the Unit

To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

If your unit has modules, secure them with the provided screws.

Warning **Statement 2004—**Grounded Equipment

This equipment is intended to be grounded to comply with emission and immunity requirements. Ensure that the switch functional ground lug is connected to earth ground during normal use.

Note **Statement 7015—**Equipment Bonding and Grounding

When you use thread-forming screws to bond equipment to its mounting metalwork, remove any paint and nonconductive coatings and clean the joining surfaces. Apply an antioxidant compound before joining the surfaces between the equipment and mounting metalwork.

Caution Grounding the chassis is required, even if the rack is already grounded. A grounding pad with two threaded holes is provided on the chassis for attaching either a grounding lug or grounding plate. The ground lug must be NRTL-listed. In addition, a copper conductor (wires) must be used and the copper conductor must comply with NEC code for ampacity.

Caution When terminating the frame ground, do not use soldering lug connectors, screwless (push-in) connectors, quick connect connectors, or other friction-fit connectors.

Procedure

Step 1 Use a wire-stripping tool to remove approximately 0.75 inches (19 mm) of the covering from the end of the #6 AWG grounding cable.

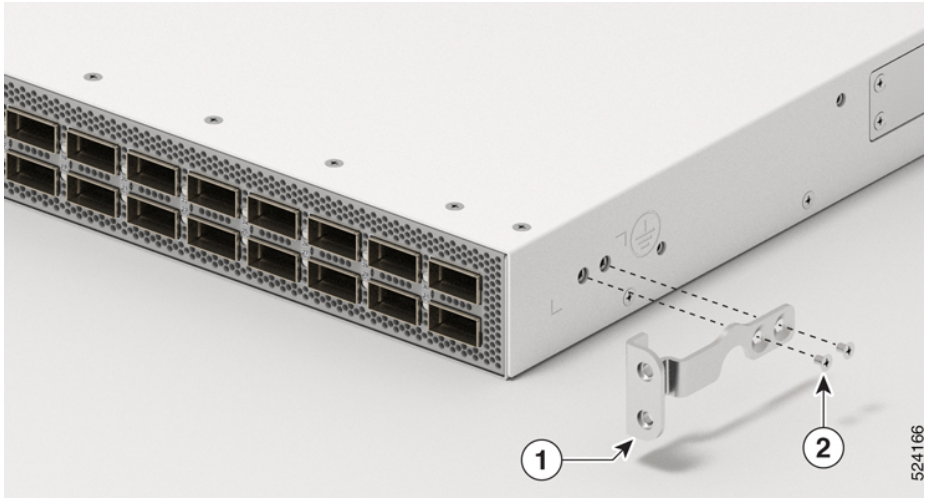
Step 2 Insert the stripped end of the grounding cable into the open end of the grounding lug.

Step 3 Use the crimping tool to secure the grounding cable in the grounding lug.

Step 4 Attach the ground cable. Attach one end of the shelf ground cable (#6 AWG cable) to the ground lug extension bracket using the specified dual-hole lug connector.

Step 5 Attach the ground lug extension bracket to the chassis.

Figure 38: Cisco 8711-32FH-M Ground Lug Extension Bracket

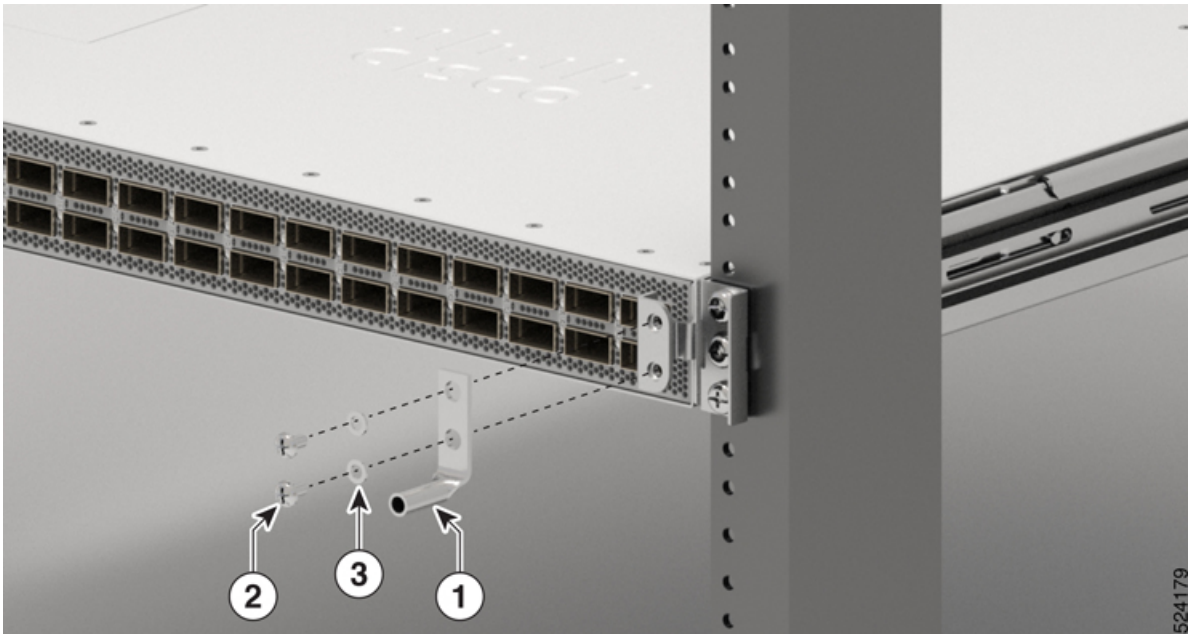


1	Ground lug extension bracket	2	2 x M4 5.7-mm Phillips flat-head screws

Step 6 Tighten the M4 5.7-mm Phillips flat-head screws to torque value of 13.28 in-lbs (1.5 N-m).

Step 7 Attach the washer and ground lug to the chassis. Tighter the two M4 5.7-mm Phillips flat-head screws to torque value of 13.28 in-lbs (1.5 N-m). Ensure that the ground lug and cable do not interfere with other equipment.

Figure 39: Install Ground Lug on Cisco 8711-32FH-M Router



1	Ground lug	2	2 x M5 7.93-mm Phillips dome-head screws
3	M5 washer		

Step 8 Prepare the other end of the grounding cable, and connect it to an appropriate grounding point in your site to ensure adequate earth ground.

Mount the Cisco 8712-MOD-M Chassis in a 2-Post Rack with Sliders

This section describes how to use the rack-mount kit provided with the Cisco 8712-MOD-M chassis, to install the chassis into a cabinet or a 2-post 19-inch rack.

⚠

Caution If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

The following table lists the items contained in the rack-mount kit provided with the routers.

Table 10: 2 Post Rack-Mount Kit - NC57-2RU-ACC-KIT2 (19 inch) and NC57-2RU-ACC-KIT4 (23 inch)

Quantity	Part Description
2	Slider assembly - left and right
2	Slider brackets - left and right
20	12-24 Phillips pan-head screws

Quantity	Part Description
26	M4 x 5.7-mm Phillips flat head screws
4	Bracket mounting adapter (available only 23-inch rack-mount kit)
1	Ground lug

Before you begin

To install the router on a 23-inch rack, install the extension brackets on the 23-inch rack post (see Install the Extension Plate on 23-inch Rack Post) and then continue with this procedure.

Procedure

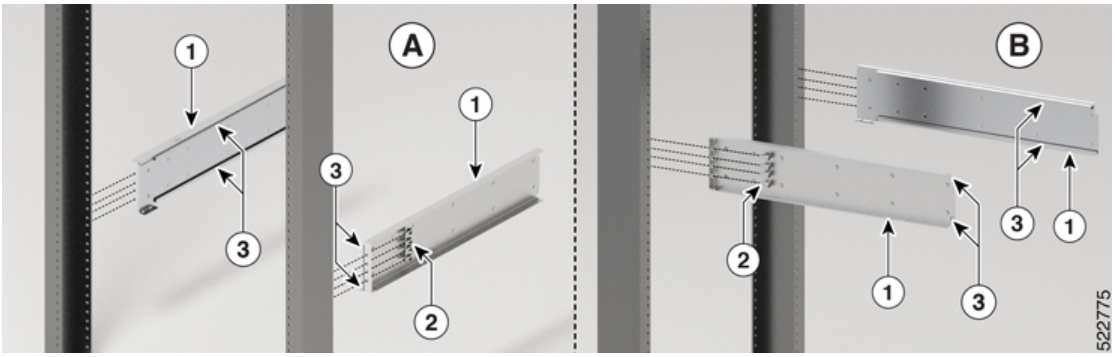
Step 1 Install the slider assembly on the rack as follows:

a) Align the left slider assembly to the rear post rack holes. The slider rail should be at the bottom.

b) Use four 12-24 Phillips pan-head screws with 30 in-lb (3.39 N.m) to attach the slider assembly to the rear post.

c) Repeat Steps 2a and 2b with the other slider assembly on the other side of the router.

Figure 40: Rack-Mount Slider Assembly on a 19-inch 2-Post Rack



1	Slider assembly	2	Screws
3	Slider rail		

Note
In case of a 23-inch 2-post rack, mount the slider assembly on the extension brackets following the same procedure outlined in Step 2.

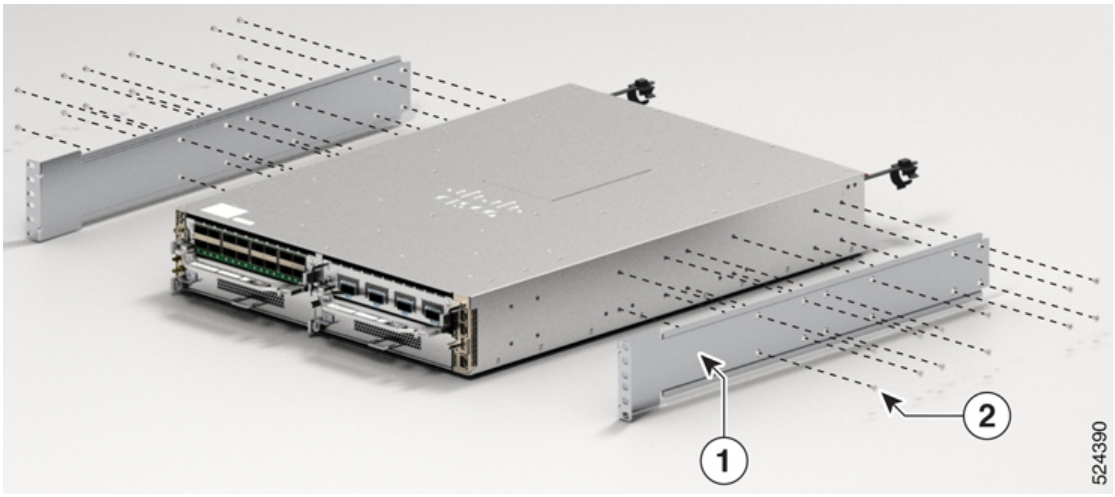
Step 2 Install slider brackets to the router as follows:

a) Determine which end of the chassis is to be located in the cold aisle as follows:

- If the router has port-side intake modules, position the router so that the ports are in the cold aisle.
- If the router has port-side exhaust modules, position the router so that the fan and power supply modules are in the cold aisle.

b) With the slider bracket ears aligned to the front of the chassis as shown in the image, use twelve M4 x 5.7 mm flat head screws with 12 in-lbs (1.4 N-m). to attach the bracket to the chassis.
c) Repeat Step 3c with the other slider bracket on the other side of the router.

Figure 41: Mount Slider Brackets

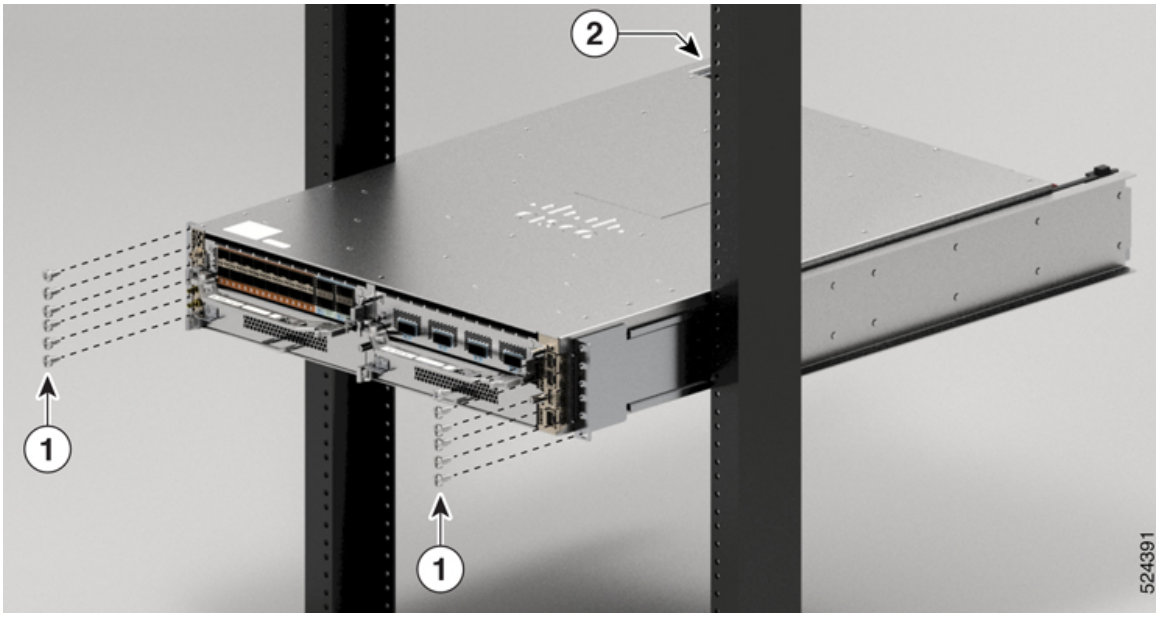


1	Slider brackets	2	Screws

Step 3 Install the router onto the 2-post rack as follows:

a) Holding the router with both hands, position the back of the router between the front posts of the rack.
b) Move the router until the slider brackets come in contact with slider rails installed in the rack. Slide the slider brackets onto the slider rails, and then gently move the router all the way into the rack.
c) Hold the chassis level while the second person inserts six pan-head screws (12-24) in each of the two rack-mount brackets (using a total of twelve screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails.
d) Tighten the 12-24 Phillips pan-head screws to 30 in-lb (3.39 N.m).

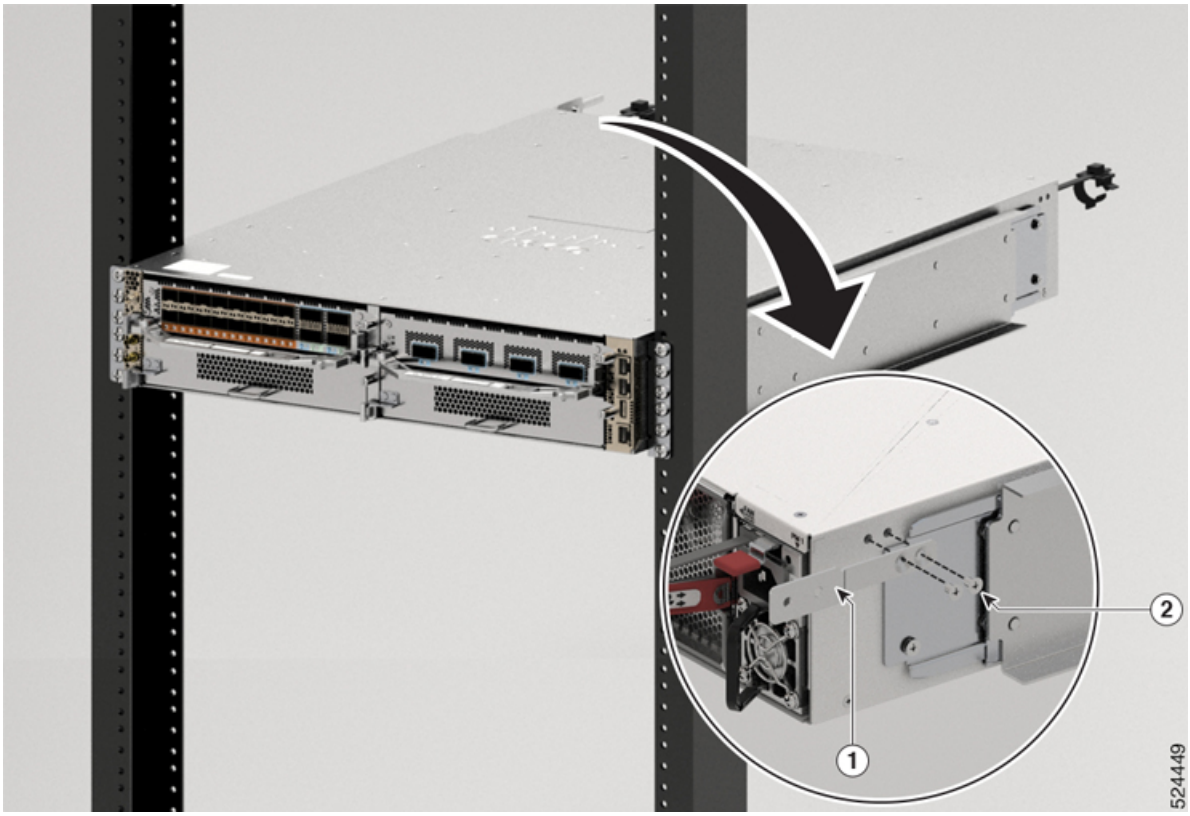
Figure 42: 19-inch 2-Post Rack Mount Chassis



1	Screws	2	Grounding pad location

Step 4 Install the grounding pad on the chassis. Use two M4 x 5.7 mm screws with 12 in-lbs (1.4 N-m).

Figure 43: Install the Grounding Pad



1	Grounding pad	2	Screws

Mount the Cisco 8712-MOD-M Chassis in a 4-Post Rack with Sliders

This section describes how to use the rack-mount kit provided with the CIsco 8712-MOD-M chassis, to install the chassis into a cabinet or a 4-post 19-inch rack.

Caution If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

The following table lists the items contained in the rack-mount kit provided with the routers.

Table 11: 4 Post Rack-Mount Kit - NC57-2RU-ACC-KIT (19 inch) and NC57-2RU-ACC-KIT3 (23 inch)

Quantity	Part Description
2	Slider assembly - left and right
2	Slider brackets - left and right

Quantity	Part Description
22	12-24 Phillips pan-head screws
22	M4 x 5.7-mm Phillips flat head screws
4	Bracket mounting adapter (available only 23-inch rack-mount kit)
1	Ground lug

Before you begin

To install the router on a 23-inch rack, install the extension brackets on the 23-inch rack post (see Install the Extension Plate on 23-inch Rack Post) and then continue with this procedure.

Procedure

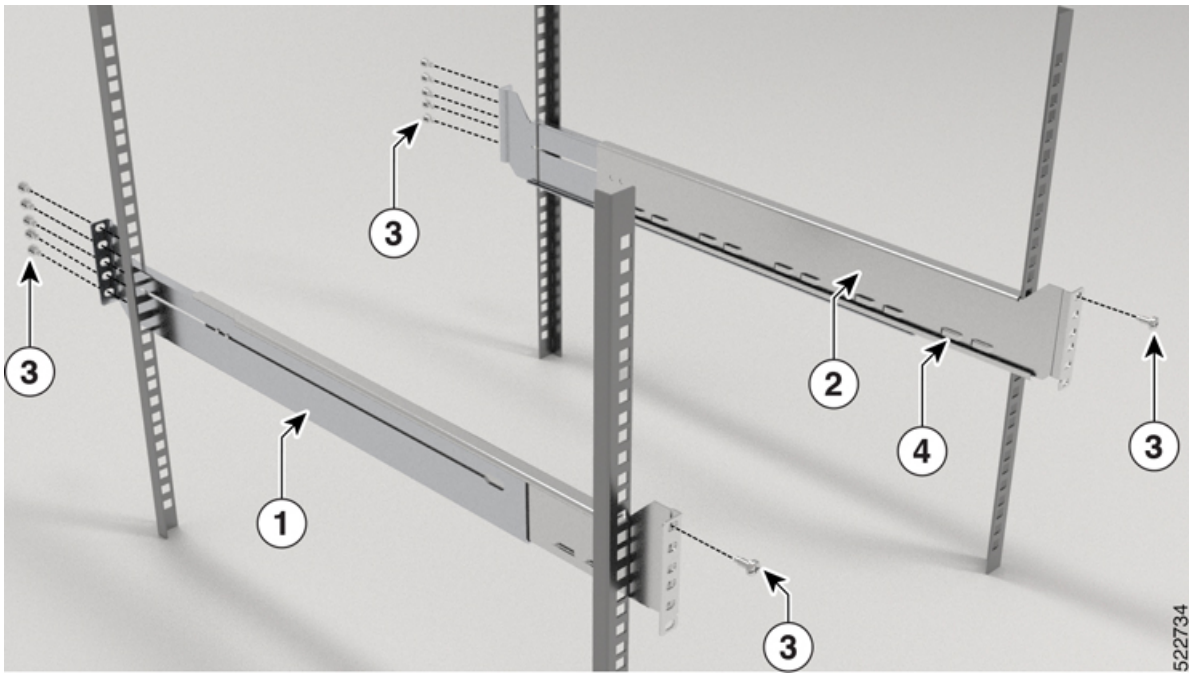
Step 1 Install the slider assembly on the rack as follows:

a) Align the outer slider of the left slider assembly to the rear post rack holes and the inner slider of the left slider assembly to the front post rack holes. The slider rail should be at the bottom.

b) Use six 12-24 Phillips pan-head screws (five on the rear side and one on the front side) with 30 in-lb (3.39 N.m) to attach the slider assembly to the rear and front rack post.

c) Repeat Steps 2a and 2b with the other slider assembly on the other side of the router.

Figure 44: Rack-Mount Slider Assembly on a 19-inch 4-Post Rack



1	Outer slider (of the slider assembly)	2	Inner slider (of the slider assembly)

3	Screws	4	Slider rail

Note
In case of a 23-inch 2-post rack, mount the slider assembly on the extension brackets following the same procedure outlined in Step 2.

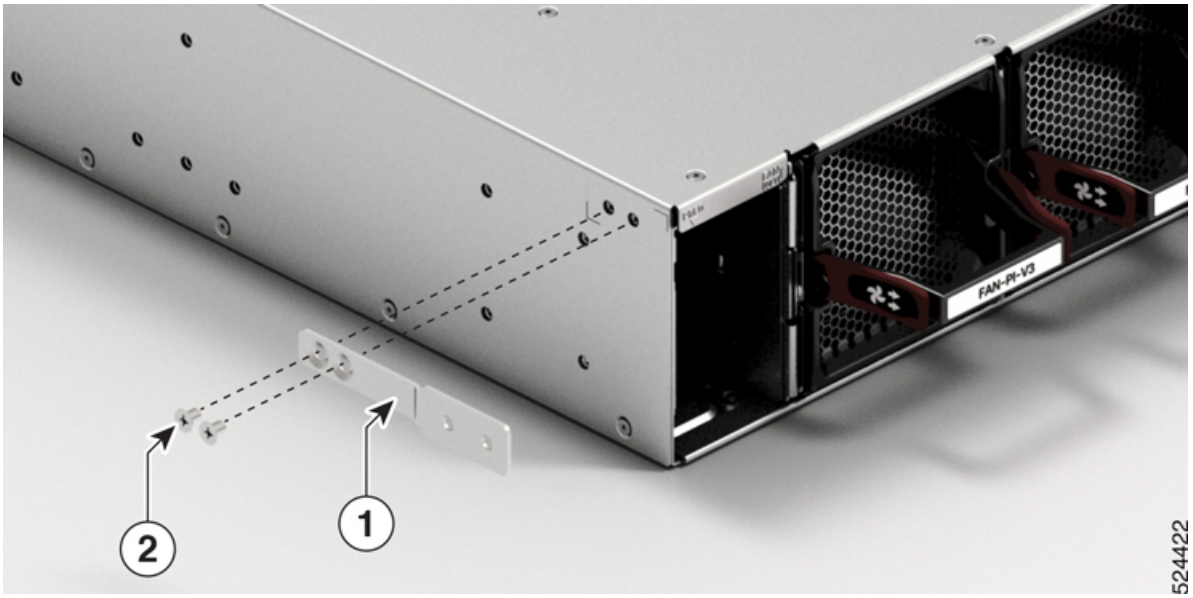
Step 2 Install slider brackets to the router as follows:

a) Determine which end of the chassis is to be located in the cold aisle as follows:

- If the router has port-side intake modules, position the router so that the ports are in the cold aisle.
- If the router has port-side exhaust modules, position the router so that the fan and power supply modules are in the cold aisle.

b) Install the grounding pad on the chassis. Use two M4 x 5.7 mm screws with 12 in-lbs (1.4 N-m).

Figure 45: Install the Grounding Pad

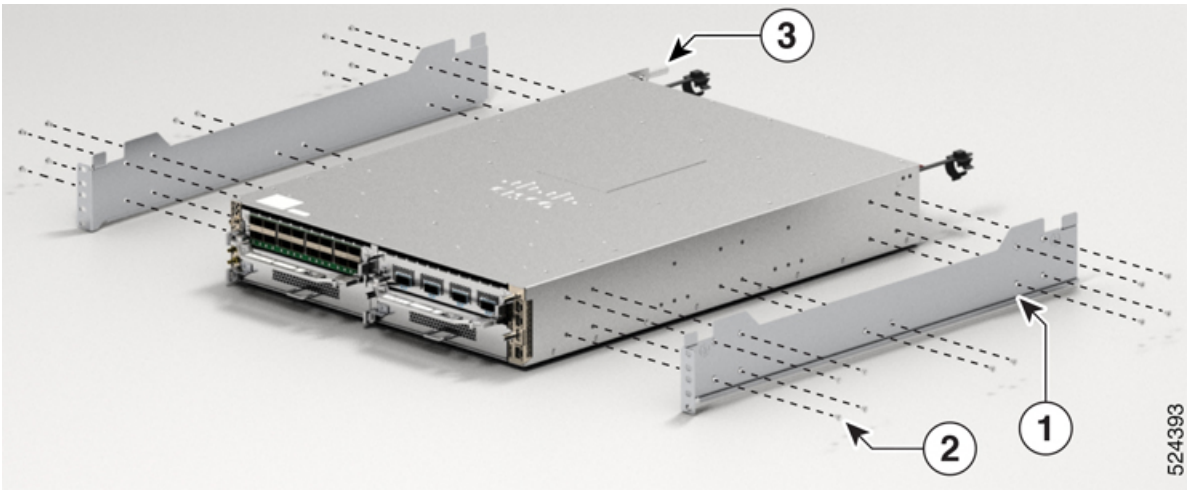


1	Grounding pad	2	Screws

c) With the slider bracket ears aligned to the front of the chassis as shown in the image, use ten M4 x 5.7 mm flat-head screws with 12 in-lbs (1.4 N-m) to attach the bracket to the chassis.

d) Repeat 3c with the other slider bracket on the other side of the router.

Figure 46: Mount Slider Brackets

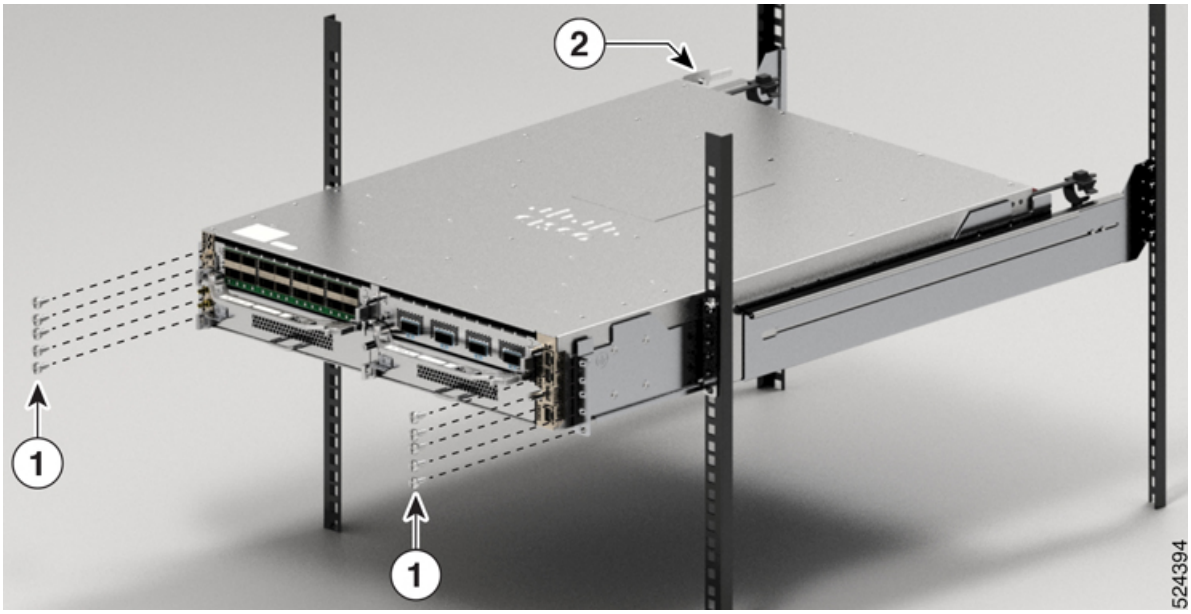


1	Slider bracket	2	Screws
3	Grounding pad		

Step 3 Install the router onto the 4-post rack as follows:

a) Holding the router with both hands, position the back of the router between the front posts of the rack.
b) Move the router until the slider brackets come in contact with slider rails installed in the rack. Slide the slider brackets onto the slider rails, and then gently move the router all the way into the rack.
c) Hold the chassis level while the second person inserts five screws (12-24) in each of the two rack-mount brackets (using a total of ten screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails.
d) Tighten the 12-24 screws (pan-head) to 30 in-lb (3.39 N.m).

Figure 47: 19-inch 4-Post Rack Mount Chassis



1	Screws	2	Grounding pad

Ground the Cisco 8712-MOD-M Router

Warning **Statement 1024—**Ground Conductor

This equipment must be grounded. To reduce the risk of electric shock, never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

Warning **Statement 1046—**Installing or Replacing the Unit

To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

If your unit has modules, secure them with the provided screws.

Caution Grounding the chassis is required, even if the rack is already grounded. A grounding pad with two threaded holes is provided on the chassis for attaching either a grounding lug or grounding cover plate. The ground lug must be NRTL-listed. In addition, a copper conductor (wires) must be used and the copper conductor must comply with NEC code for ampacity.

Caution When terminating the frame ground, do not use soldering lug connectors, screwless (push-in) connectors, quick connect connectors, or other friction-fit connectors.

Procedure

Step 1 Use a wire-stripping tool to remove approximately 0.75 inches (19 mm) of the covering from the end of the #6 AWG grounding cable.

Step 2 Insert the stripped end of the grounding cable into the open end of the grounding lug.

Step 3 Use the crimping tool to secure the grounding cable in the grounding lug.

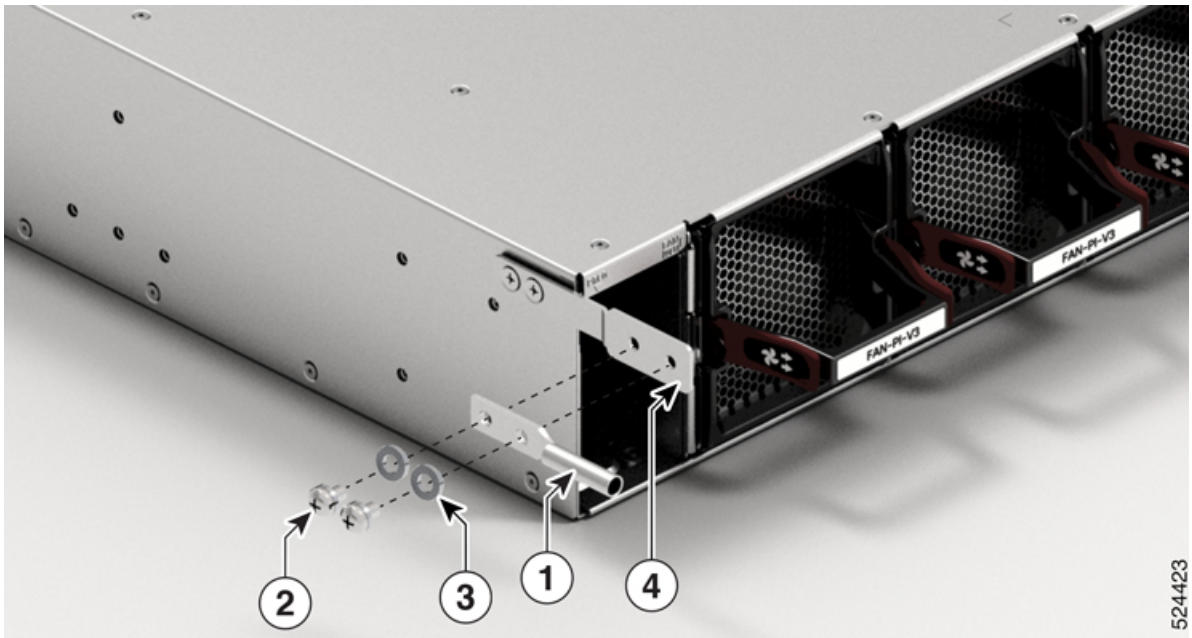
In Cisco 8712-MOD-M routers, vertical crimping is required to secure the grounding cable.

Step 4 Attach the ground cable:

a) Remove the adhesive label from the grounding pad on the chassis.

b) Place the grounding lug against the grounding pad so that there is solid metal-to-metal contact, and insert the provided screws with washers through the holes in the grounding lug and into the grounding pad.

Figure 48: 8712-MOD-M Ground Lug



1	Ground lug	2	Pan-head screws
3	Washer	4	Grounding pad

c) Attach one end of the shelf ground cable (#6 AWG cable) to the grounding cover plate using the specified dual-hole lug connector.

Step 5 Tighten the pan-head screws to torque value of 11.5 in-lbs (1.3 N-m).

Step 6 Ensure that the lug and cable do not interfere with other equipment.

Step 7 Prepare the other end of the grounding cable and connect it to an appropriate grounding point in your site to ensure adequate earth ground.

Install Cable Management Brackets

Install a Cable Management Bracket on Cisco 8711-32FH-M

To install a cable-management bracket, follow these steps:

Before you begin

The chassis must be installed and secured to the rack.

Required tools and equipment:

- Phillips screwdriver with a torque capability (customer supplied)
- Cable management bracket

Note

- The cable management bracket is shipped with the chassis.
- The cable management bracket for Cisco 8711-32FH-M router supports only fiber-optics cables.

Procedure

Step 1 Remove the middle screw from the left side of the chassis. Save the screw for re-installation.

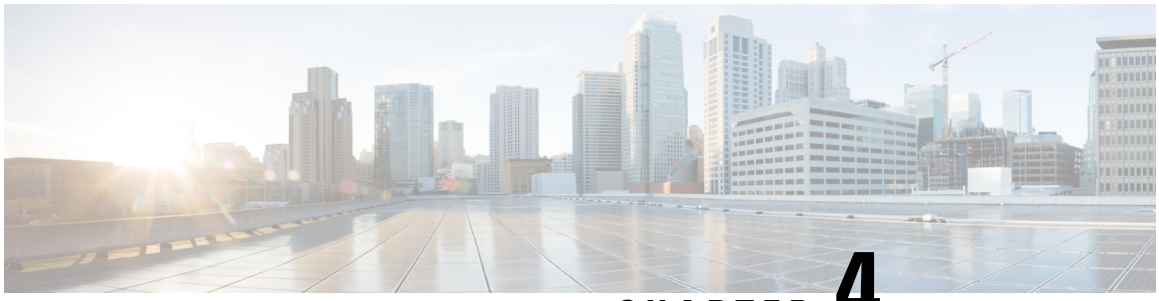
Step 2 Align the cable management bracket with the chassis on the left side as shown in the image.

Note
The right side of the chassis is reserved for installing the ground lug.

Figure 49: Install Cable Management Bracket on the Cisco 8711-32FH-M Router

1	Cable management bracket	2	Screws

Step 3 Tighten the M5 (12-24) screws to 27.88 in-lb (3.1 N.m) on the left side.



CHAPTER 4

Powering on the Router

This chapter describes how to connect the power modules in the chassis and to power on the router.

Power Supply Overview

You can install up to two 2KW AC (PSU2KW-ACPI or PSU2KW-ACPE) or 2KW DC (PSU2KW-DCPI or PSU2KW-DCPE) power supplies in the chassis. Ensure that all power connection wiring conforms to the rules and regulations in the National Electrical Code (NEC) and in local codes.

Note The Cisco 8700 Series routers doesn't support a mix of:

- AC and DC Power Supply Units (PSUs).
- Port-Side Intake (PSI) and Port-Side Exhaust (PSE) configurations.

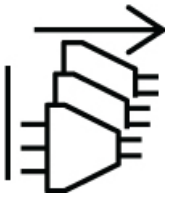
Module Type	Description	Nominal Range
AC Power	single feed with 2KW capacity at 12V	100—127V AC, 12A, 50—60Hz and 200—240V AC, 10A, 50—60Hz.
DC Power	dual feed with 2KW capacity at any specified input voltage.	-48—60V DC, 55A

Power Connection Guidelines for AC-Powered Systems

When connecting AC-input Power Supply Units (PSUs) to the site power source, observe the guidelines described here.

Warning **Statement 1028—**More Than One Power Supply

This unit might have more than one power supply connection. To reduce risk of electric shock, remove all connections to de-energize the unit.



- Ensure that the AC-input power supply module has a detachable power cord.
- Each chassis power supply should have a separate, dedicated branch circuit.
  - North America
    - PSU-2KW-ACPI and PSU-2KW-ACPE —Power supply modules require a 20 A circuit.
  - International—Circuits should be sized according to local and national codes.
- If you are using a 208 or 240 VAC power source in North America, note that such lines are considered hot and the circuit must be protected by a two-pole circuit breaker.

Warning **Statement 1005—**Circuit Breaker

This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:

- 20 A (North America) and 16 A (Europe) circuit breaker for an AC-input power supply module.
- 55 A DC-rated circuit breaker for each input of a DC-input power supply module, for safety purposes - irrespective of whether the inputs are power from a single or separate DC sources.

Warning **Statement 1022—**Disconnect Device

To reduce the risk of electric shock and fire, a readily accessible disconnect device must be incorporated in the fixed wiring.

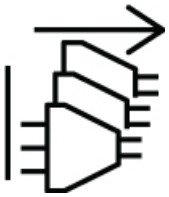
- The source AC outlet must be within 9.84 to 14 feet (3.0 to 4.293 meters) of the system - depending on the length of the power cord, and should be easily accessible.
- The AC power receptacles used to plug in the chassis must be the grounding type. The grounding conductors that connect to the receptacles should connect to protective earth ground at the service equipment level.

Power Supply Unit Input and Output Ranges

Power Supply Restrictions and Considerations

Warning **Statement 1028—**More Than One Power Supply

This unit might have more than one power supply connection. To reduce risk of electric shock, remove all connections to de-energize the unit.



Warning **Statement 1005—**Circuit Breaker

This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:

- 20 A (North America) and 16 A (Europe) circuit breaker for an AC-input power supply module.
- 55 A DC-rated circuit breaker for each input of a DC-input power supply module, for safety purposes - irrespective of whether the inputs are power from a single or separate DC sources.

Warning **Statement 1022—**Disconnect Device

To reduce the risk of electric shock and fire, a readily accessible disconnect device must be incorporated in the fixed wiring.

Warning **Statement 1090—**Installation by Skilled Person

Only a skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of a skilled person.

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Warning **Statement 1091—**Installation by an Instructed Person

Only an instructed person or skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of an instructed or skilled person.

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Warning **Statement 1073—**No User-Serviceable Parts

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Warning **Statement 1099—**Before Connecting to System Power Supply

High touch/leakage current—Permanently connected protective earth ground is essential before connecting to the system power supply.

Warning **Statement 1100—**Before Making Telecommunication Network Connection

High touch/leakage current—Permanently connected protective earth ground is essential before connecting to the telecommunication network.

Observe the following guidelines and limitations:

- Use one type of power supply in a router.
- The power supply type that is used in the router depends on the type and configuration of the transceivers installed in it.
- Do not install a mix of AC and DC power supplies in a router.
- The airflow direction must be the same for all power supply and fan modules in the router.
- The AC-input power supplies support low-line voltage of 120V (Nominal) and high-line voltage of 220V (Nominal). If you need to change voltage type after installation, disconnect the feed from the power supply before switching the input voltage level.

Connect AC Power to the Chassis

Caution The chassis relies on the protective devices in the building installation to protect against short circuit, overcurrent, and ground faults. Ensure that the protective devices comply with local and national electrical codes.

Note We recommend that you occupy both the power supply slots of the fixed port routers with power supplies. In case a power module fails, it is recommended to retain the failed power module in its slot until it is replaced with a new power module. This recommendation ensures that the system airflow is not impacted adversely, which may then result in the overheating of the router and its components.

Warning **Statement 1017—**Restricted Area

This unit is intended for installation in restricted access areas. Only skilled, instructed, or qualified personnel can access a restricted access area.

Warning **Statement 1003—**DC Power Disconnection

To reduce risk of electric shock or personal injury, disconnect DC power before removing or replacing components or performing upgrades.

Warning **Statement 1046—**Installing or Replacing the Unit

To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

If your unit has modules, secure them with the provided screws.

Warning **Statement 1022—**Disconnect Device

To reduce the risk of electric shock and fire, a readily accessible disconnect device must be incorporated in the fixed wiring.

For Cisco 8700 series router, the following power supplies are supported:

- PSU2KW-ACPI – 2000W AC, port-side intake airflow
- PSU2KW-ACPE – 2000W AC, port-side exhaust airflow

Important

- System shall not operate at input voltage: 100-127VAC, 50/60Hz with a single AC power supply condition.
- System shall operate at input voltage: 100-127VAC, 50/60Hz with dual AC power supply condition.

Note A dual pole breaker is needed for installation. For determining the recommended breaker size, please adhere to local and national rules and regulations. The breaker size is based on the specifications of the product for the current drawn and the specified voltage level.

Procedure

Step 1 Verify that the AC cable is installed in the correct AC source and outlet type.

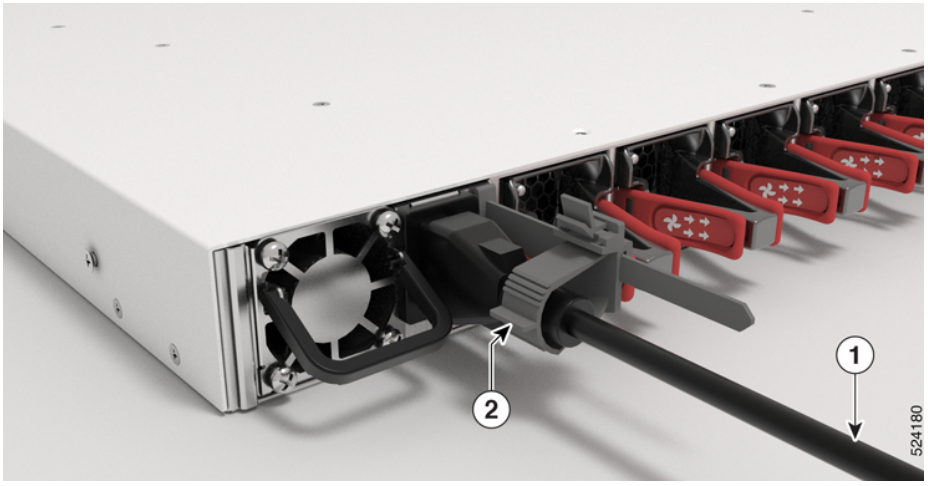
Step 2 Attach the AC power cable to the cable connector in the AC power module.

Step 3 Place the cable through the opening in the cable tie.

Step 4 Slide the cable tie toward the plug.

Step 5 Close the cable tie on the shoulder of the power cable to secure the power cable.

Figure 50: Connecting AC Power - Cisco 8711-32FH-M



1	AC power cable	2	Cable tie

Figure 51: Connecting AC Power - Cisco 8712-MOD-M

1	AC power cable

Connect DC Power to the Chassis

Caution The chassis relies on the protective devices in the building installation to protect against short circuit, overcurrent, and ground faults. Ensure that the protective devices comply with local and national electrical codes.

Note We recommend that you occupy both the power supply slots of the fixed port routers with power supplies. In case a power module fails, it is recommended to retain the failed power module in its slot until it is replaced with a new power module. This recommendation ensures that the system airflow is not impacted adversely, which may then result in the overheating of the router and its components.

For Cisco 8700 series router, the following power supplies are supported:

- PSU2KW-DCPI – 2000W AC, port-side intake airflow
- PSU2KW-DCPE – 2000W AC, port-side exhaust airflow

Procedure

Step 1 Verify that the correct fuse panel is installed in the top mounting space.

Step 2 Ensure that the DC circuit is powered down (either breaker turned off or fuse pulled) and proper lockout tag out procedures are followed. Use the cable (PID: PWR-2KW-DC-CBL) supplied with the power supply. You can purchase power supply cord separately from Cisco.

Step 3 Dress the power according to local practice.

Step 4 Connect the office battery and return cables according to the fuse panel engineering specifications.

Step 5 Insert the DC connector into the DC receptacle on the power supply.

Figure 52: Connecting DC Power - Cisco 8711-32FH-M

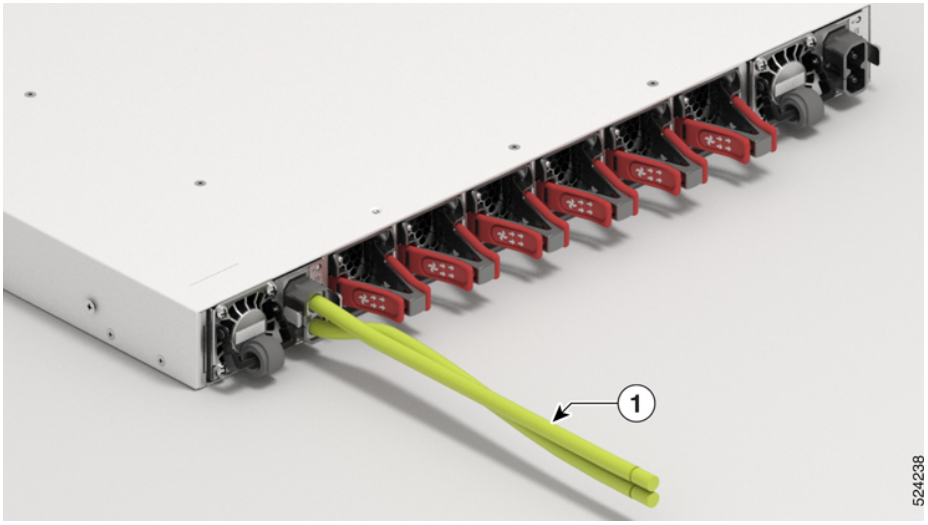
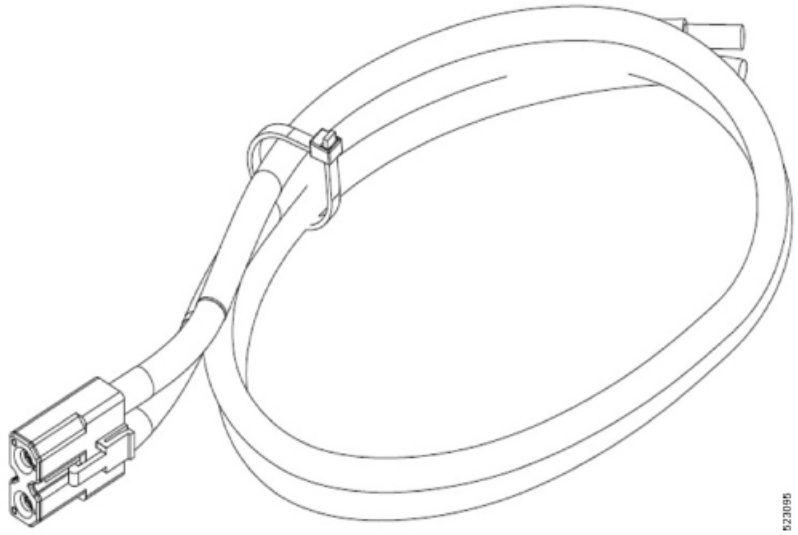


Figure 53: Connecting DC Power - Cisco 8712-MOD-M

1	DC power cable

Figure 54: DC Power Cable - PWR-2KW-DC-CBL



Step 6 Ensure that the locking mechanism has engaged to secure the cable.

Step 7 Turn on the circuit breaker at the power source.

AC/DC-Input Power Cord Options

This table summarises the input and output power ranges for PSU high line applications:

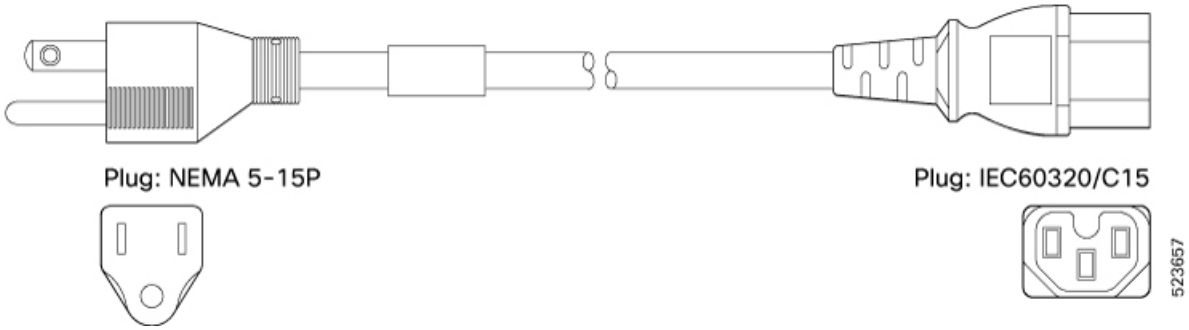
AC/DC-Input Power Cord Options for Cisco 8700 Series Routers

Table 12: AC-Input Power Cord Options for Cisco 8700 Series Routers

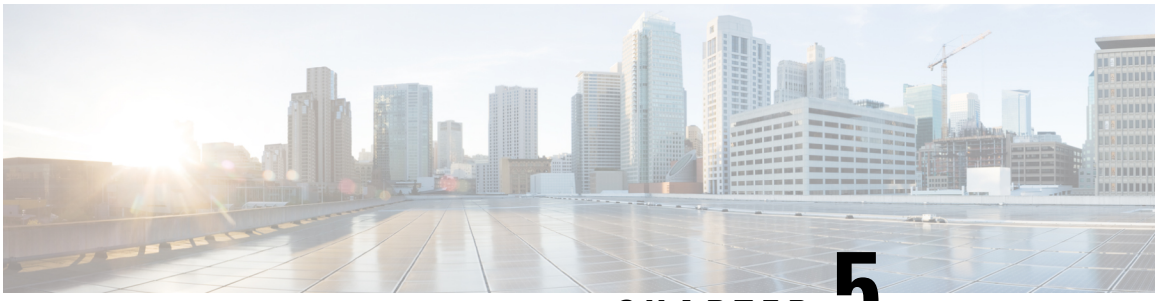
Locale	Part Number	Length	Power Cord Rating
Australia, New Zealand	CAB-AC-10A-ANZ	14 ft (4.26 m)	10A, 250 VAC
Brazil	CAB-AC-10A-BRZ	14 ft (4.26 m)	10A, 250 VAC
Britain	CAB-AC-10A-GBR	14 ft (4.26 m)	10A, 250 VAC
China	CAB-AC-10A-CHN	14 ft (4.26 m)	10A, 250 VAC
Denmark	CAB-AC-10A-DEN	14 ft (4.26 m)	10A, 250 VAC

Locale	Part Number	Length	Power Cord Rating
Europe	CAB-AC-10A-EU	14 ft (4.26 m)	10A, 250 VAC
Italy	CAB-AC-10A-ITA	14 ft (4.26 m)	10A, 250 VAC
Japan	CAB-AC-10A-JPN1	14 ft (4.26 m)	10A, 250 VAC
Japan	CAB-AC-10A-JPN2	14 ft (4.26 m)	10A, 250 VAC
Korea	CAB-AC-10A-KOR	14 ft (4.26 m)	10A, 250 VAC
North America	CAB-AC-10A-NA	14 ft (4.26 m)	13A, 125 VAC
Switzerland	CAB-AC-10A-CHE	14 ft (4.26 m)	10A, 250 VAC
Cabinet Jumper Power Cord, 250 VAC 13A, C14-C15 Connectors	CAB-C15-CBN	14 ft (4.26 m)	13A, 250 VAC

Figure 55: CAB-AC-10A-NA



Note For a 2KW DC PSU, use the cable (PID: PWR-2KW-DC-CBL) supplied with the power supply. You can purchase power supply cord separately from Cisco.



CHAPTER 5

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.

Interfaces and Port Description

Cisco 8711-32FH-M

Figure 56: Cisco 8711-32FH-M Fixed Port Router - Front View Port Description

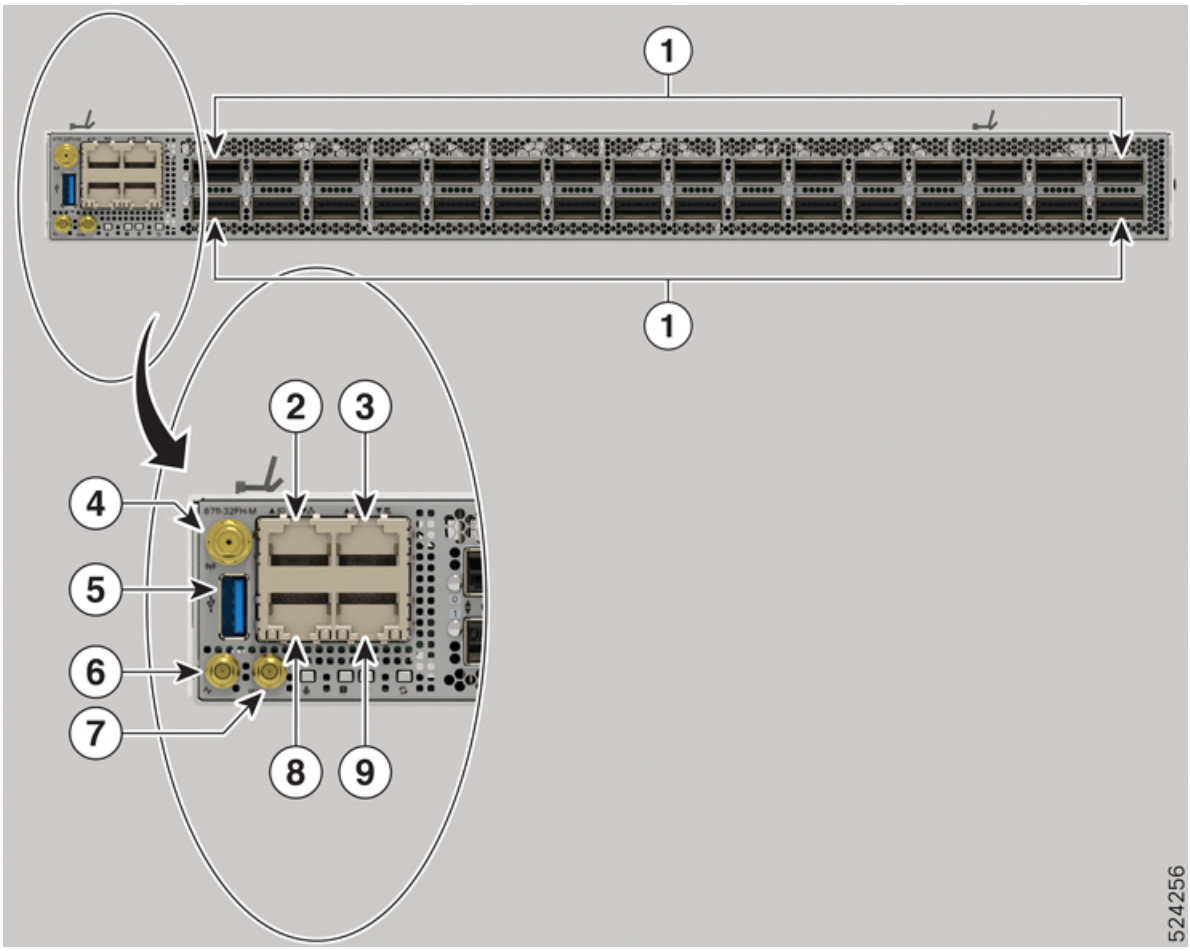


Table 13: Cisco 8711-32FH-M Fixed Port Router Front View Port Description

1	32 QSFP56-DD 400GbE ports or 16 QSFP-DD 800G ports. These ports support the following breakout operation: • 2x400 GbE • 8x100 GbE • 4x100 GbE • 2x100 GbE • 4x10 GbE • 4x25 GbE • For the Port-Side Intake (PSI) configuration, he QDD-400G-ZR-S, QDD-400G-ZRP-S, and DP04QSDD-HE0 optical modules are only supported on the even-numbered ports (top row). • For the Port-Side Exhaust (PSE) configuration, he QDD-400G-ZR-S, QDD-400G-ZRP-S, and DP04QSDD-HE0 optical modules are only supported on the odd-numbered ports (bottom row). **Note** You must have dust caps installed on the unused ports.	6	Mini coax connector for 1 PPS, input, and output.
2	Console port	7	Mini coax connector for 10MHz, input, and output
3	Time of the Day (ToD) port	8	10G Control Plane Expansion port
4	GNSS port **Note** Lifting the signal amplitude to the suitable range for the receiver frontend. The amplification required is 20dB gain + cable/connector loss + Splitter signal loss. The recommended range of LNA gain (minus all cable and connector losses) at the connector of the receiver module is a minimum of 20dB and a maximum of 45dB.	9	1G Management port
5	USB Port Type-A		

Cisco 8712-MOD-M

Figure 57: Cisco 8711-32FH-M Fixed Port Router - Front View Port Description

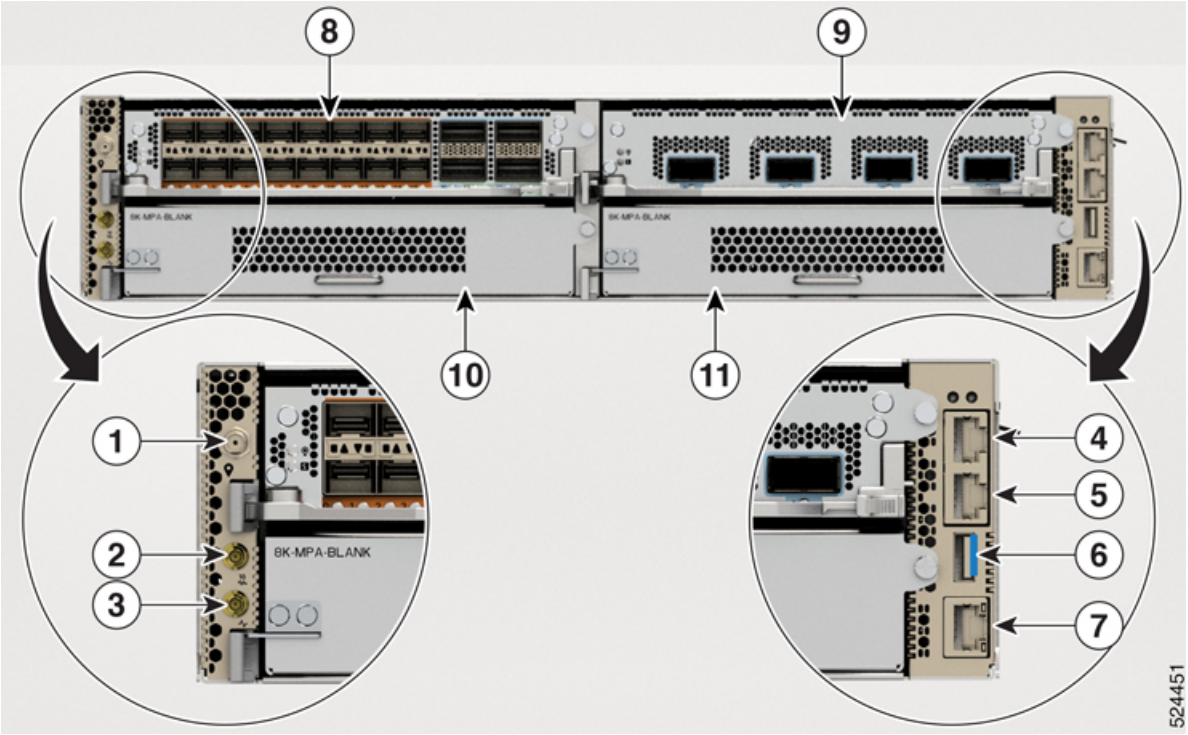


Table 14: Cisco 8712-MoD-M Fixed Port Router Front View Port Description

1	GNSS port **Note** Lifting the signal amplitude to the suitable range for the receiver frontend. The amplification required is 20dB gain + cable/connector loss + Splitter signal loss. The recommended range of LNA gain (minus all cable and connector losses) at the connector of the receiver module is a minimum of 20dB and a maximum of 45dB.	7	1G Management port
2	Mini coax connector for 10MHz, input, and output	8	MPA Slot 0
3	Mini coax connector for 1 PPS, input, and output.	9	MPA Slot 1
4	Time of the Day (ToD) port	10	MPA Slot 2
5	Console port	11	MPA Slot 3
6	USB Port Type-A		

Transceiver and Cable Specifications

To determine which transceivers and cables are supported by this router, refer to the Transceiver Module Group (TMG) Compatibility Matrix Tool:

https://tmgmatrix.cisco.com/home

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

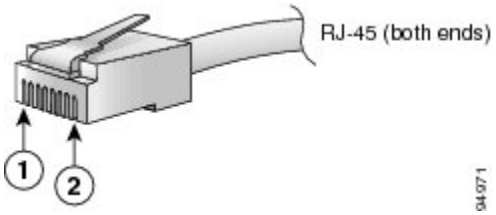
The RJ-45 connector connects Category 3, Category 5, Category 5e, Category 6, or Category 6A foil twisted-pair or unshielded twisted-pair cable from the external network to the following module interface connectors:

- 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 58: RJ-45 Connector



1	Pin 1	2	Pin 8

Install and Remove SFP or SFP+ Modules

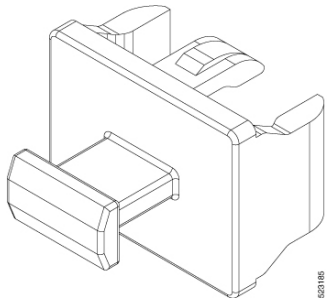
Before you remove or install an SFP or SFP+ module, read the installation information in this section.

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 59: 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.

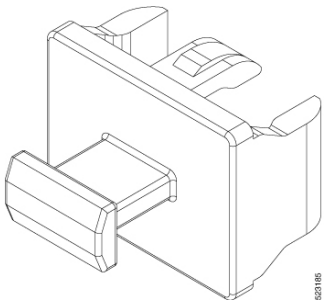
Caution We strongly recommended that you do not install or remove the SFP or SFP+ module with fiber-optic cables that are attached to it because of the potential of damaging the cable, the cable connector, or the optical interfaces in the module. Disconnect all cables before removing or installing an 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 60: Bale Clasp SFP or SFP+ 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.

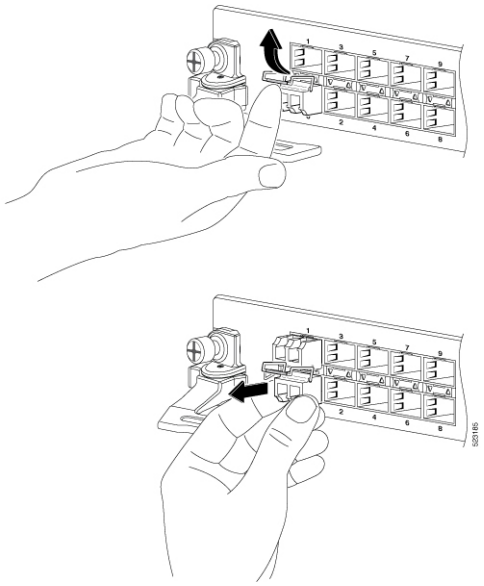
Step 2 Disconnect and remove all interface cables from the ports; note the current connections of the cables to the ports on the line card.

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 61: 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.

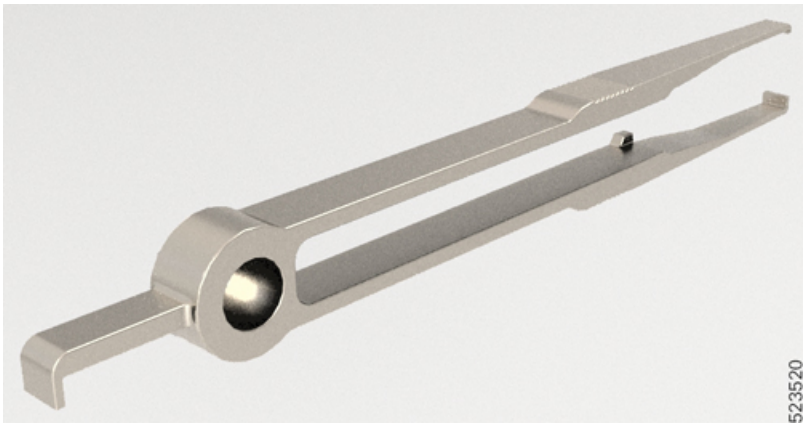
Step 6 Protect your line card by inserting a clean SFP module cage covers into the optical module cage when there is no SFP module installed.

Using the Optical Transceiver Extraction Tool

In a fully loaded 8K-MPA-16Z2D MPA, the bale clasps of the SFP optics without pull tabs can be difficult to access. You can use the Optical Transceiver Extraction Tool to remove the network cable, open the bale clasp, and remove the transceiver.

Note SFP28 optics with pull tabs do not require the tool.

Figure 62: Optical Transceiver Extraction Tool ()

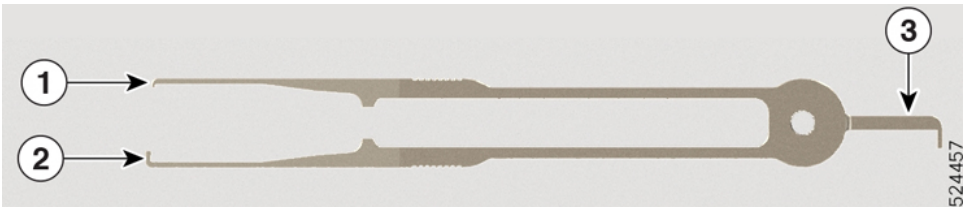


To use the Optical Transceiver Extraction Tool to remove an SFP28 or SFP+ module, follow these steps:

Procedure

Step 1 Remove the optical cable from the transceiver:

a) Hold the tool with the small hook at the top, as shown in the illustration.

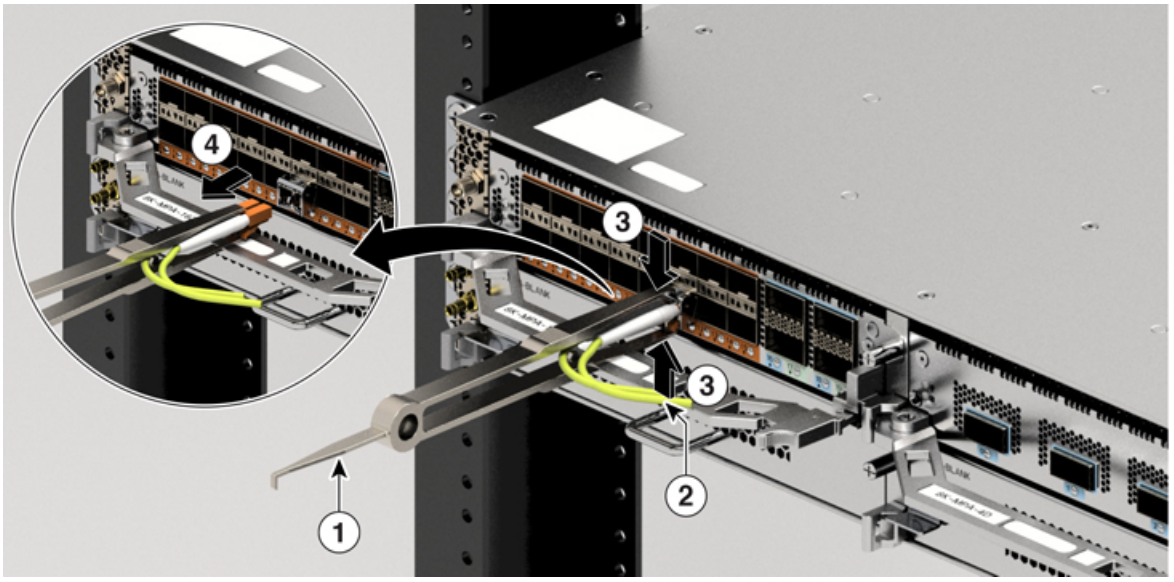


1	Small hook: • Squeeze the cable connector
2	Large hook: • Grasp the optical cable
3	Front hook • Grab the open bale clasp • Remove the transceiver from the port

b) Place the opening of the extraction tool over the optical cable connector.

Note
The large hook should be in contact with the transceiver so that the small hook can squeeze the cable connector.

Figure 63: Remove the optical cable from the transceiver



1	Front hook
2	Optical cable
3	Large hook in contact with the transceiver so that the small hook can squeeze the cable connector
4	Remove the optical cable from the transceiver

c) Squeeze the tool to press down on the optical cable connector latch (step 3 in the illustration)..

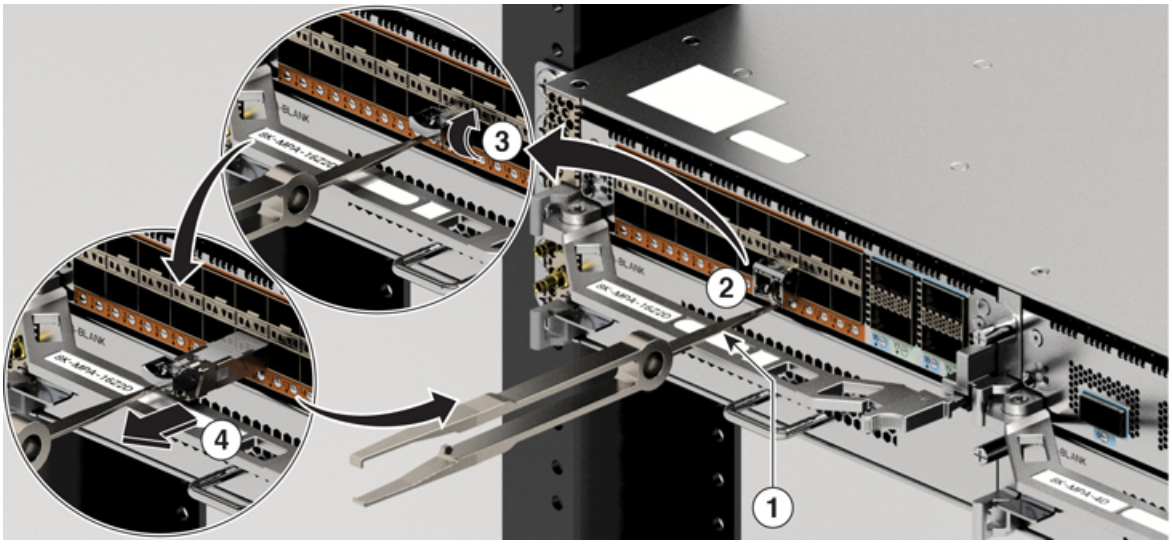
Note
Make sure that the tool does not pinch the optical cable.

d) Pull the cable from the transceiver (step 4 in the illustration).

Step 2 Remove the transceiver from the port:

a) Hold the tool with the single hook facing upwards, as shown in the illustration.

Figure 64: Remove the transceiver from the port



b) Use the front hook to grasp the bale clasp (step 2 in the illustration).

1	front hook

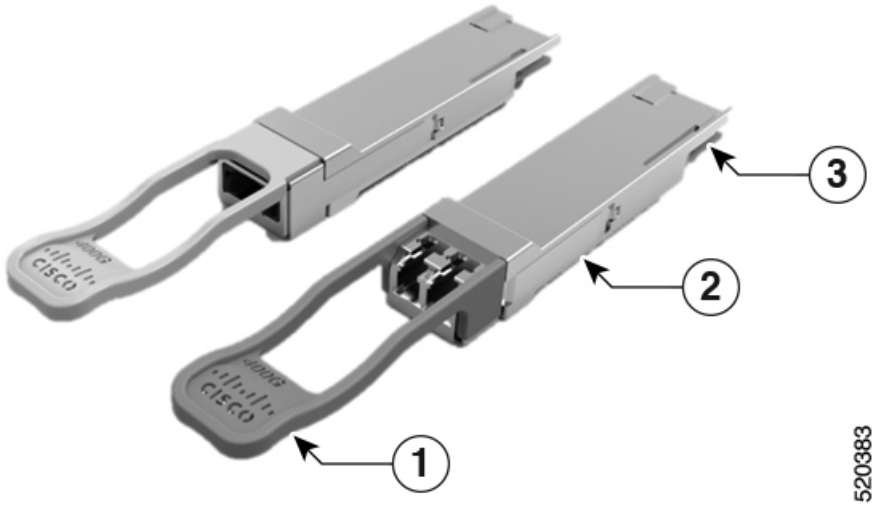
c) Open the bale clasp latch (step 3 in the illustration).
d) Use the single hook to grab the open bale clasp (step 4 in the illustration).
e) Remove the transceiver from the port.
f) Place the removed SFP module on an antistatic mat, or immediately place it in a static shielding bag if you plan to return it to the factory.
g) Protect your line card by inserting a clean SFPmodule cage cover 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 65: 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 following table provides the supported port details and operating temperature of the QDD-400G-ZR-S, QDD-400G-ZRP-S, and DP04QSDD-HE0 optical modules when port side intake fans and power supplies are used.

Table 15: Supported Ports and Operating Temperature of QDD-400G-ZR-S, QDD-400G-ZRP-S, DP04QSDD-HE0, DP04QSDD-ER1, DP01QSDD-ZF1 Optical Modules

Router	Port Side Intake (PSI) Ports	Port Side Intake (PSI) Operating Temperature
Cisco 8711-32FH-M	• QDD-400G-ZR-S – supported on all 400G ports • QDD-400G-ZRP-S – supported on all 400G ports • DP04QSDD-HE0 - supported only on even numbered ports. • DP04QSDD-ER1 – supported on all 400G ports • DP01QSDD-ZF1 – supported on all 400G ports	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 66: Installing the QSFP Transceiver Module - Cisco 8711-32FH-M

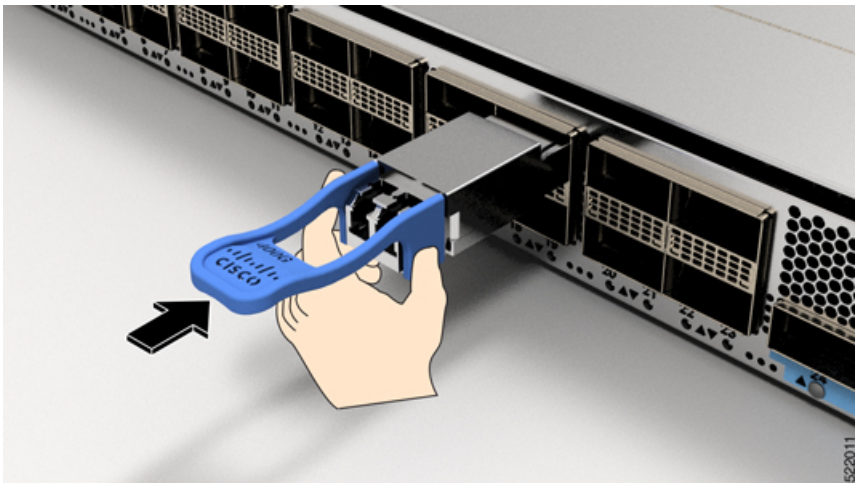
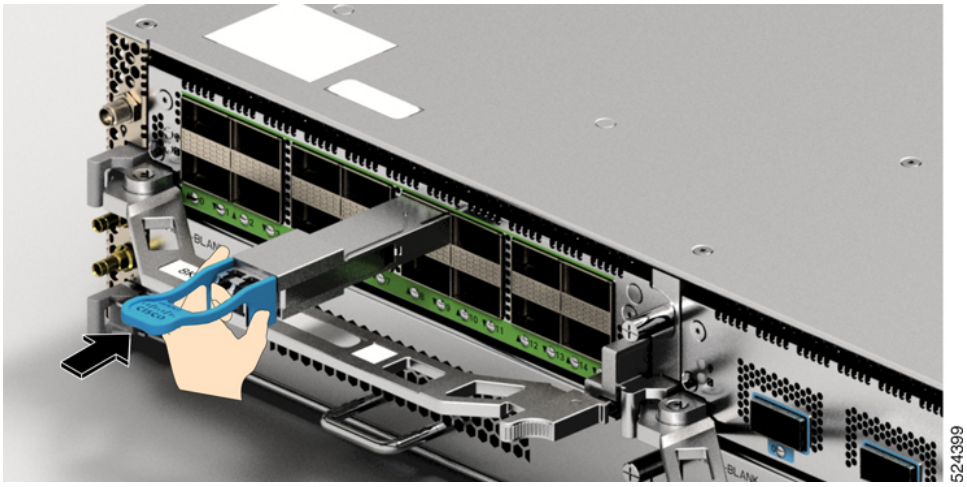


Figure 67: Installing the QSFP Transceiver Module - Cisco 8712-MOD-M



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 68: Seating the QSFP Transceiver Module - Cisco 8711-32FH-M

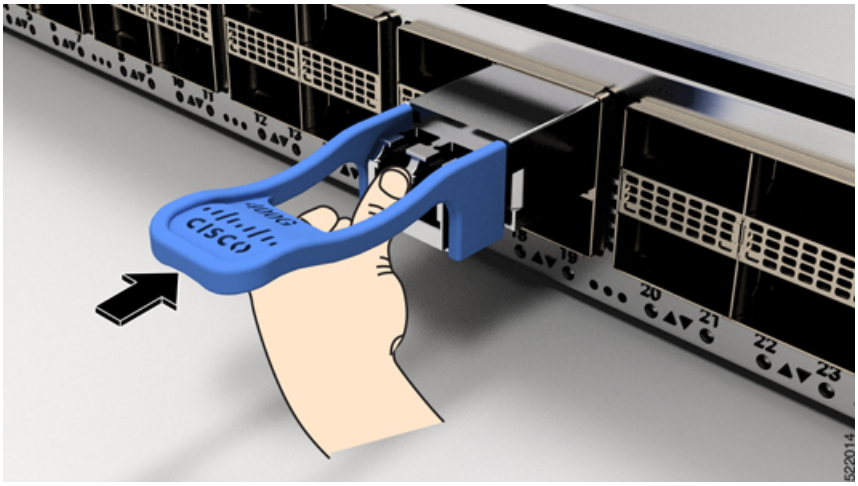
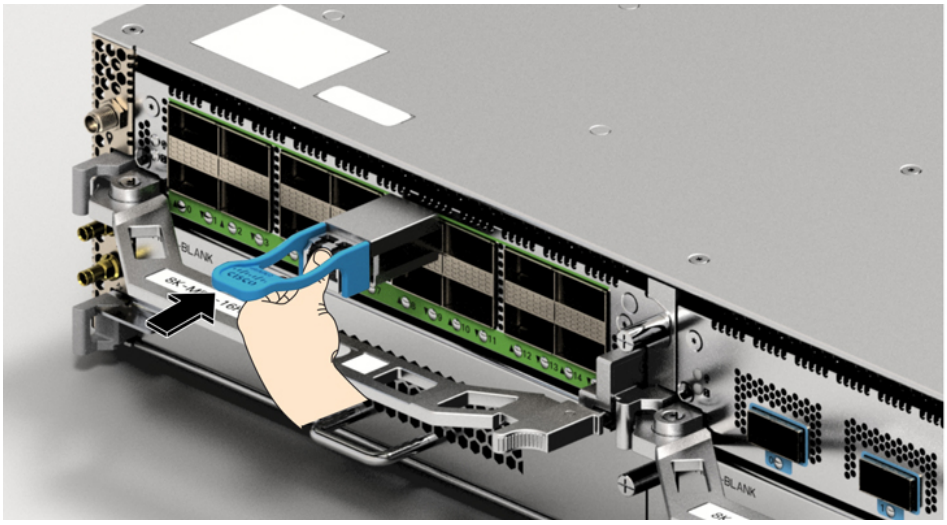


Figure 69: Seating the QSFP Transceiver Module - Cisco 8712-MOD-M



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 70: Cabling a Transceiver Module -Cisco 8711-32FH-M

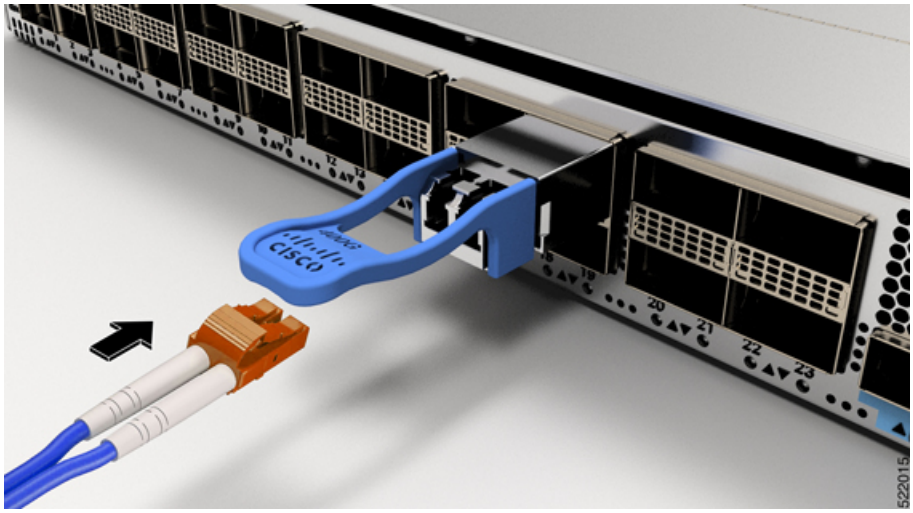
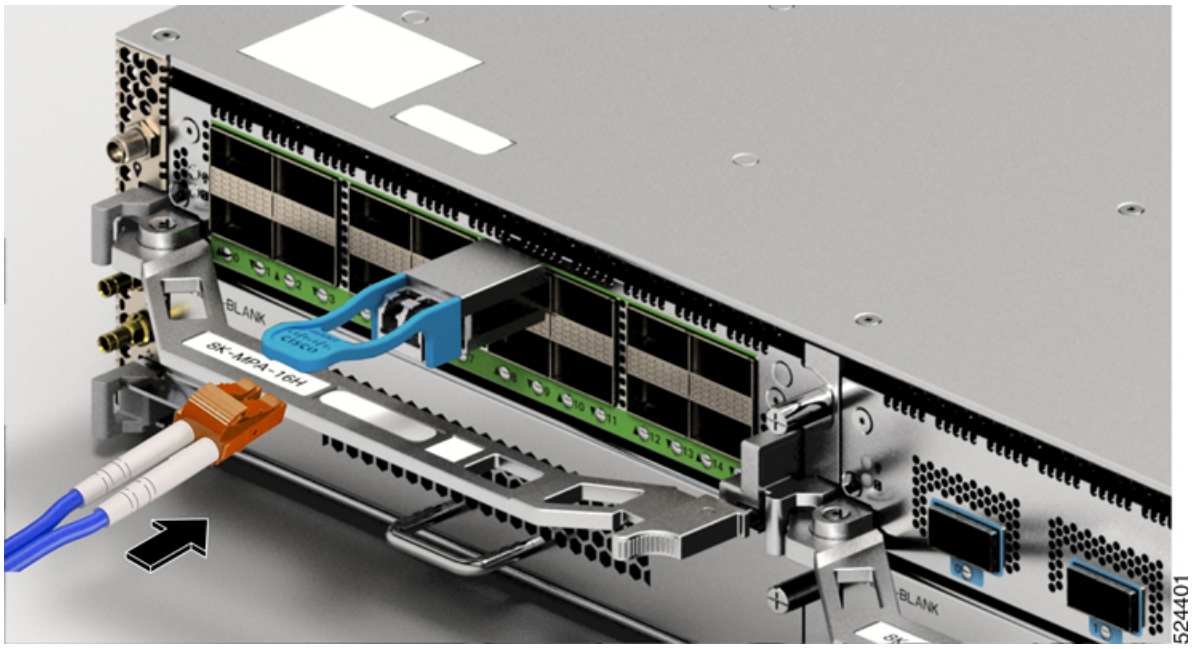


Figure 71: Cabling a Transceiver Module -Cisco 8712-MOD-M



Removing 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 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.

Dust caps are optional and are orderable separately from Cisco and are available for a variety of input/output connectors.

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 72: Removing the QSFP Transceiver Module - Cisco 8711-32FH-M

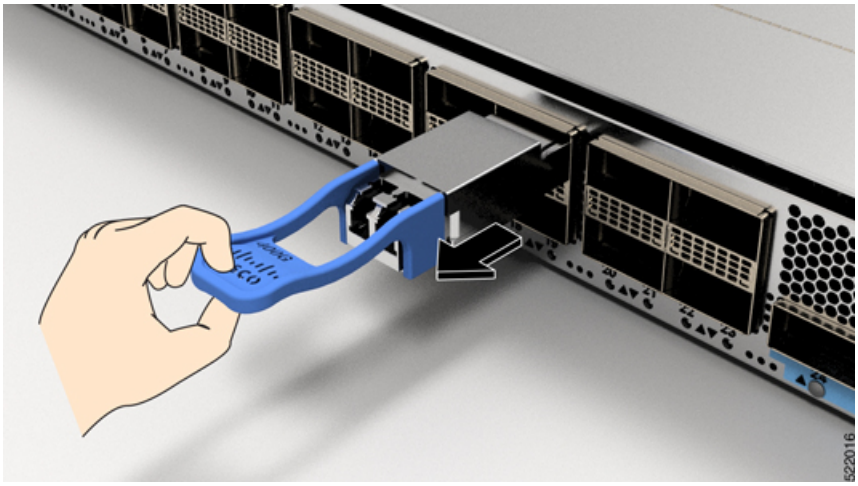
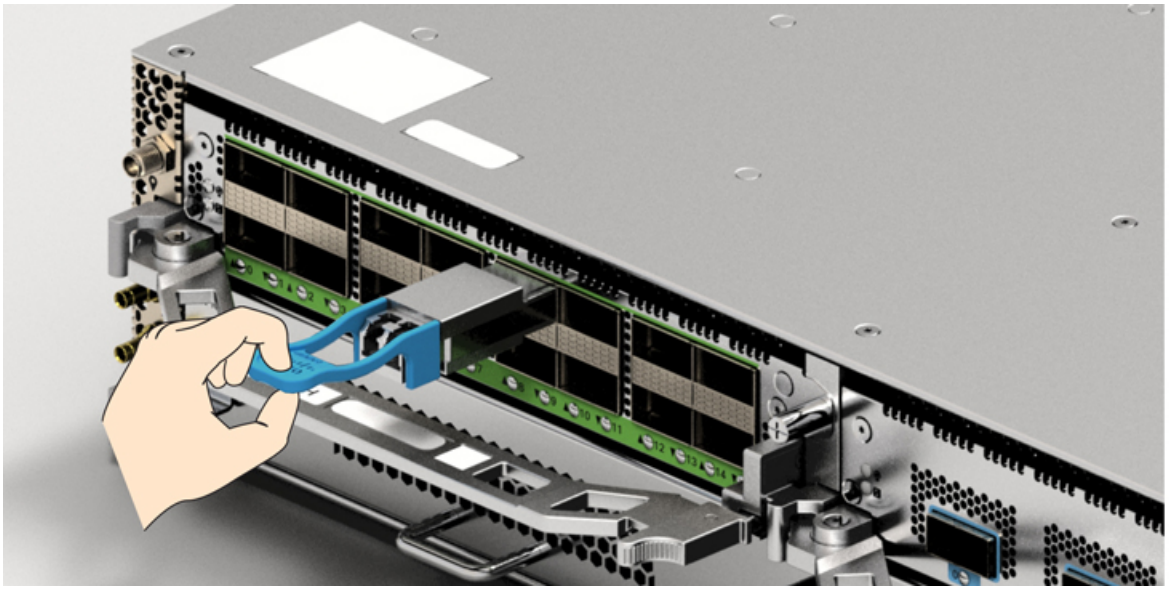


Figure 73: Removing the QSFP Transceiver Module - Cisco 8712-MOD-M



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 8712 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 inventory	Displays information about the field replaceable units (FRUs), including product IDs, serial numbers, and version IDs.
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 environment power	Displays the power usage information for the entire router.
show environment fan	Displays the status of the fan trays.

Command	Description

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.
show environment current	Displays the current environment status.

show platform command

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

```
Router#show platform
Node               Type                      State                     Config state
--------------------------------------------------------------------------------
0/RP0/CPU0         8711-32FH-M(Active)       IOS XR RUN                NSHUT
0/FB0              8711-32FH-M[FB]           OPERATIONAL               NSHUT
0/FT0              FAN-1RU-PI-V2             OPERATIONAL               NSHUT
0/FT1              FAN-1RU-PI-V2             OPERATIONAL               NSHUT
0/FT2              FAN-1RU-PI-V2             OPERATIONAL               NSHUT
0/FT3              FAN-1RU-PI-V2             OPERATIONAL               NSHUT
0/FT4              FAN-1RU-PI-V2             OPERATIONAL               NSHUT
0/FT5              FAN-1RU-PI-V2             OPERATIONAL               NSHUT
0/PM1              PSU2KW-ACPI               OPERATIONAL               NSHUT
Router#
```

show inventory command

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

```
Router#show inventory

NAME: "Rack 0", DESCR: "Cisco 8711 1RU 12.8T P100 System"
PID: 8711-32FH-M       , VID: V00, SN: FOC2736R0J6

NAME: "0/RP0/CPU0", DESCR: "Cisco 8711 1RU 12.8T P100 System"
PID: 8711-32FH-M       , VID: V00, SN: FOC28100ZZ2

NAME: "FourHundredGigE0/0/0/9", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24155513

NAME: "FourHundredGigE0/0/0/10", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24155181

NAME: "FourHundredGigE0/0/0/11", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24165748

NAME: "FourHundredGigE0/0/0/12", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24164974

NAME: "FourHundredGigE0/0/0/13", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24154273

NAME: "FourHundredGigE0/0/0/14", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24173660

NAME: "FourHundredGigE0/0/0/15", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL26010LMV

NAME: "FourHundredGigE0/0/0/16", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL26010LHK

NAME: "FourHundredGigE0/0/0/17", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24155081

NAME: "FourHundredGigE0/0/0/18", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24155387

NAME: "FourHundredGigE0/0/0/19", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL25141382

NAME: "FourHundredGigE0/0/0/20", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24155386

NAME: "FourHundredGigE0/0/0/21", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
```

```
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL26010LH9

NAME: "FourHundredGigE0/0/0/22", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24155108

NAME: "FourHundredGigE0/0/0/23", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL26010LHP

NAME: "FourHundredGigE0/0/0/24", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24155086

NAME: "FourHundredGigE0/0/0/25", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24165460

NAME: "FourHundredGigE0/0/0/26", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24165426

NAME: "FourHundredGigE0/0/0/27", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24173668

NAME: "FourHundredGigE0/0/0/28", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL2530A7DP

NAME: "FourHundredGigE0/0/0/29", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: ES0 , SN: INL23342230

NAME: "FourHundredGigE0/0/0/30", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24173675

NAME: "FourHundredGigE0/0/0/31", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL25188245

NAME: "FourHundredGigE0/0/0/3", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24155312

NAME: "FourHundredGigE0/0/0/4", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24154278

NAME: "FourHundredGigE0/0/0/5", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24165696

NAME: "FourHundredGigE0/0/0/6", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24155313

NAME: "FourHundredGigE0/0/0/7", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL24155369

NAME: "FourHundredGigE0/0/0/8", DESCR: "Cisco QSFPDD 400G DR4 Pluggable Optics Module"
PID: QDD-400G-DR4-S    , VID: V01 , SN: INL26010LMW

NAME: "0/FB0", DESCR: "Cisco 8000 Series Fan Controller Board on 8711-32FH-M"
PID: 8711-32FH-M[FB]   , VID: N/A, SN: FOC28100C6N

NAME: "0/FT0", DESCR: "1RU Fan with Port-side Air Intake Ver 2"
PID: FAN-1RU-PI-V2     , VID: V02 , SN: DCH2735R30X

NAME: "0/FT1", DESCR: "1RU Fan with Port-side Air Intake Ver 2"
PID: FAN-1RU-PI-V2     , VID: V02 , SN: DCH2735R2ST

NAME: "0/FT2", DESCR: "1RU Fan with Port-side Air Intake Ver 2"
PID: FAN-1RU-PI-V2     , VID: V02 , SN: DCH2735R2TS

NAME: "0/FT3", DESCR: "1RU Fan with Port-side Air Intake Ver 2"
PID: FAN-1RU-PI-V2     , VID: V02 , SN: DCH2735R2ZJ
```

```
NAME: "0/FT4", DESCR: "1RU Fan with Port-side Air Intake Ver 2"
PID: FAN-1RU-PI-V2     , VID: V02 , SN: DCH2735R2S0

NAME: "0/FT5", DESCR: "1RU Fan with Port-side Air Intake Ver 2"
PID: FAN-1RU-PI-V2     , VID: V02 , SN: DCH2735R34P

NAME: "0/PM1", DESCR: "2000W AC Power Module with Port-side Air Intake"
PID: PSU2KW-ACPI       , VID: V01 , SN: QCS27517S0E
Router#
```

show led command

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

```
Router#show led
================================================================================
Location        LED Name             Mode                 Color
================================================================================
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/PM0
                Status               OPERATIONAL          GREEN
0/PM1
                Status               OPERATIONAL          GREEN
0/RP0/CPU0
                Attention            OPERATIONAL          OFF
                GNSS                 OPERATIONAL          OFF
                GPS                  OPERATIONAL          OFF
                Status               OPERATIONAL          BLINKING RED
                Sync                 OPERATIONAL          OFF
Router#
```

show hw-module fpd command

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

```
Router#show hw-module fpd

Auto-upgrade:Enabled,PM excluded
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 8711-32FH-M           0.3   Bios             S   CURRENT    5.05    5.05
0/RP0/CPU0
0/RP0/CPU0 8711-32FH-M           0.3   BiosGolden       BS  NEED UPGD          5.04
0/RP0/CPU0
0/RP0/CPU0 8711-32FH-M           0.3   IoFpga               CURRENT    1.09    1.09
```

```
  0/RP0
0/RP0/CPU0 8711-32FH-M           0.3   IoFpgaGolden     B   NEED UPGD          1.06
  0/RP0
0/RP0/CPU0 8711-32FH-M           0.3   x86Fpga          S   CURRENT    2.11    2.11
  0/RP0
0/RP0/CPU0 8711-32FH-M           0.3   x86FpgaGolden    BS  CURRENT            2.07
  0/RP0
0/RP0/CPU0 8711-32FH-M           0.3   x86TamFw         S   CURRENT    9.07    9.07
  0/RP0
0/RP0/CPU0 8711-32FH-M           0.3   x86TamFwGolden   BS  CURRENT            9.05
  0/RP0
0/PM1      PSU2KW-ACPI           0.0   QC-PrimMCU           CURRENT    1.01    1.01
NOT REQ
0/PM1      PSU2KW-ACPI           0.0   QC-SecMCU            CURRENT    3.02    3.02
NOT REQ
0/FB0      8711-32FH-M[FB]       0.3   IoFpga               CURRENT    1.10    1.10
NOT REQ
0/FB0      8711-32FH-M[FB]       0.3   IoFpgaGolden     B   CURRENT            1.10
NOT REQ
Router#
```

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

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



------------------------------------------------------------------------------------
0/RP0/CPU0      Major        FPD_Infra        01/09/2021 13:48:11 UTC    One Or More FPDs
Need Upgrade Or Not In Current State


0/RP0/CPU0      Major        Software         01/09/2021 13:50:22 UTC    Communications
Failure With Cisco Licensing Cloud


0/RP0/CPU0      Critical     Environ          01/09/2021 13:50:26 UTC    DIE_TEMP_PHY_0:
temperature alarm


0/RP0/CPU0      Critical     Environ          01/09/2021 13:50:31 UTC    DIE_TEMP_PHY_1:
temperature alarm


0/RP0/CPU0      Critical     Environ          01/09/2021 13:50:36 UTC    DIE_TEMP_PHY_2:
temperature alarm


0/RP0/CPU0      Critical     Environ          01/09/2021 13:50:41 UTC    DIE_TEMP_PHY_3:
temperature alarm


0/RP0/CPU0      Critical     Environ          01/09/2021 13:50:46 UTC    DIE_TEMP_PHY_4:
temperature alarm
```

```
0/RP0/CPU0      Critical     Environ          01/09/2021 13:50:51 UTC    DIE_TEMP_PHY_5:
temperature alarm

0/RP0/CPU0      Critical     Environ          01/09/2021 13:50:56 UTC    DIE_TEMP_PHY_6:
temperature alarm

0/RP0/CPU0      Critical     Environ          01/09/2021 13:51:01 UTC    DIE_TEMP_PHY_7:
temperature alarm


Router#
```

Note If there's a mismatch of the interface state between the active and standby modes of the components that are available on the front of the chassis, the router generates an alarm. For information on components available on the front of the chassis, see Cisco 8700 Series Routers.

show media command

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

```
Router#show media

Media Info for Location: node0_RP0_CPU0
Partition                            Size     Used  Percent    Avail
------------------------------------------------------------------------
rootfs:                             71.6G     9.4G      13%    62.3G
data:                              339.1G     2.5G       1%   336.6G
tmp:                                 32G     168K       1%      32G
/var/lib/docker                     9.3G     796K       1%     8.8G
disk0:                              9.3G     200K       1%     8.8G
harddisk:                            70G      58M       1%      67G
log:                                9.3G     163M       2%     8.7G
Router#
```

show environment power command

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

```
Router#show environment power
================================================================================
CHASSIS LEVEL POWER INFO: 0
================================================================================
   Total output power capacity (Group 0 + Group 1) :    2000W +        0W
   Total output power required                     :    1940W
   Total power input                               :    1238W
   Total power output                              :    1168W

Power Group 0:
================================================================================
   Power       Supply         ------Input----   ------Output---     Status
   Module      Type            Volts     Amps    Volts     Amps
================================================================================
   0/PM1       PSU2KW-ACPI     217.2     5.7     12.0      97.4     OK

Total of Group 0:             1238W/5.7A         1168W/97.4A
```

```
==============================================================================
   Location     Card Type                Power       Power       Status
                                         Allocated   Used
                                         Watts       Watts
==============================================================================
   0/RP0/CPU0   8711-32FH-M              1670        -           ON
   0/FT0        FAN-1RU-PI-V2            45          9           ON
   0/FT1        FAN-1RU-PI-V2            45          9           ON
   0/FT2        FAN-1RU-PI-V2            45          9           ON
   0/FT3        FAN-1RU-PI-V2            45          9           ON
   0/FT4        FAN-1RU-PI-V2            45          9           ON
   0/FT5        FAN-1RU-PI-V2            45          9           ON
Router#
```

show environment fan command

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

```
Router#show environment fan
==============================================================
                                          Fan speed (rpm)
Location      FRU Type                    FAN_0    FAN_1
--------------------------------------------------------------

0/FT0        FAN-1RU-PI-V2                 24030   21090
0/FT1        FAN-1RU-PI-V2                 24000   20970
0/FT2        FAN-1RU-PI-V2                 23730   20850
0/FT3        FAN-1RU-PI-V2                 23760   20760
0/FT4        FAN-1RU-PI-V2                 23880   20970
0/FT5        FAN-1RU-PI-V2                 23940   20970
0/PM0        PSU2KW-ACPI                   18752   17248
0/PM1        PSU2KW-ACPI                   18816   17152
Router#
```

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
==============================================================================================================
Location  TEMPERATURE                          Value     Crit     Major    Minor    Minor
  Major    Crit
           Sensor                            (deg C)     (Lo)      (Lo)     (Lo)     (Hi)
   (Hi)     (Hi)
--------------------------------------------------------------------------------------------------------------
0/RP0/CPU0
          NPU_0_T6                             51       NA       NA       NA       NA
    NA       NA
          NPU_0_T7                             53       NA       NA       NA       NA
    NA       NA
          NPU_0_T8                             50       NA       NA       NA       NA
    NA       NA
          NPU_0_T9                             56       NA       NA       NA       NA
    NA       NA
          NPU_0_T10                            56       NA       NA       NA       NA
    NA       NA
          NPU_0_T11                            50       NA       NA       NA       NA
    NA       NA
          NPU_0_T12                            57       NA       NA       NA       NA
```

```
NA       NA
      NPU_0_T13                        53       NA       NA       NA       NA
NA       NA
      NPU_0_T14                        50       NA       NA       NA       NA
NA       NA
      NPU_0_T15                        51       NA       NA       NA       NA
NA       NA
      NPU_0_T16                        53       NA       NA       NA       NA
NA       NA
      NPU_0_T17                        50       NA       NA       NA       NA
NA       NA
      NPU_0_T18                        51       NA       NA       NA       NA
NA       NA
      NPU_0_T19                        51       NA       NA       NA       NA
NA       NA
      NPU_0_T20                        51       NA       NA       NA       NA
NA       NA
      NPU_HBM_0_T1                     49       NA       NA       NA       NA
NA       NA
      NPU_HBM_0_T2                     49       NA       NA       NA       NA
NA       NA
      NPU_HBM_0_T3                     47       NA       NA       NA       NA
NA       NA
      NPU_HBM_0_T4                     49       NA       NA       NA       NA
NA       NA
      MNP0_IFG_VDDH_I_T                51      -10       -5        0      110
115      125
      MNP0_IFG_VDDH_E_T                49      -10       -5        0      110
115      125
      MNP0_HBM_VDD_I_T                 51      -10       -5        0      110
115      125
      MNP0_HBM_VDD_E_T                 47      -10       -5        0      110
115      125
      MU101_ADC_A_T                    49      -10       -5        0       95
100      105
      MU101_ADC_B_T                    49      -10       -5        0       95
100      105
      MU101_ADC_C_T                    48      -10       -5        0       95
100      105
      MU507_ADC_A_T                    48      -10       -5        0       95
100      105
      MU507_ADC_B_T                    48      -10       -5        0       95
100      105
      MU507_ADC_C_T                    48      -10       -5        0       95
100      105
      MU369_ADC_A_T                    48      -10       -5        0       95
100      105
      MU369_ADC_B_T                    48      -10       -5        0       95
100      105
      CHAS_INLET_T_I_T                 57      -15      -10       -5       95
100      105
      MB_PORT_Sensor                   29      -15      -10       -5       42
 45       50
      CHAS_OUTLET_T_I_LEFT_T           34      -15      -10       -5       70
 75       80
      CHAS_OUTLET_T_I_RIGHT_T          38      -15      -10       -5       70
 75       80
      SSD_TEMP_T                       51      -10        0        5       72
 75       83
    ! DIE_TEMP_PHY_0                -1003      -10       -5        0      110
120      125
    ! DIE_TEMP_PHY_1                -1003      -10       -5        0      110
120      125
    ! DIE_TEMP_PHY_2                -1003      -10       -5        0      110
```

```
   120      125
        ! DIE_TEMP_PHY_3                  -1003      -10       -5        0       110
   120      125
        ! DIE_TEMP_PHY_4                  -1003      -10       -5        0       110
   120      125
        ! DIE_TEMP_PHY_5                  -1003      -10       -5        0       110
   120      125
        ! DIE_TEMP_PHY_6                  -1003      -10       -5        0       110
   120      125
        ! DIE_TEMP_PHY_7                  -1003      -10       -5        0       110
   120      125
          NPU_0_T0                           51       NA       NA       NA        NA
    NA       NA
          NPU_0_T1                           53       NA       NA       NA        NA
    NA       NA
          NPU_0_T2                           51       NA       NA       NA        NA
    NA       NA
          NPU_0_T3                           52       NA       NA       NA        NA
    NA       NA
          NPU_0_T4                           52       NA       NA       NA        NA
    NA       NA
          NPU_0_T5                           51       NA       NA       NA        NA
    NA       NA
          CTC_U24_DIE_T                      47      -10       -5        0       110
   115      125
          CTC_Mid_Left_Temp_T                52      -10       -5        0        80
    90       95
          CTC_Mid_Right_Temp_T               52      -10       -5        0        80
    90       95
          LTC2979_A_TEMP_T                   46      -10        0        5        90
   100      105
          LTC2979_B_TEMP_T                   46      -10        0        5        90
   100      105
          FAN_Sensor                         49      -10        0        5        75
    80       85
          CPU_CORE_TEMP_0_T                  58      -10        0        5        90
    95      100
          CPU_CORE_TEMP_1_T                  57      -10        0        5        90
    95      100
          CPU_CORE_TEMP_2_T                  57      -10        0        5        90
    95      100
          CPU_CORE_TEMP_3_T                  57      -10        0        5        90
    95      100
          SODIMM_0_TEMP_T                    51      -10        0        5        85
    95      100
          SODIMM_1_TEMP_T                    51      -10        0        5        85
    95      100
          TI_2PLUS1_TEMP_T                   53      -10        0        5       110
   120      125
          TI_1PLUS1_TEMP_T                   52      -10        0        5       110
   120      125
          IOB Ambient Temp_T                 36      -10       -5        0        50
    55       60
Router#
```

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
```

```
Location  TEMPERATURE                          Value      Crit     Major    Minor    Minor
  Major    Crit
           Sensor                            (deg C)     (Lo)     (Lo)     (Lo)     (Hi)
   (Hi)     (Hi)
-------------------------------------------------------------------------------------------
0/RP0/CPU0
           NPU_0_T6                            51       NA       NA       NA       NA
    NA        NA
           NPU_0_T7                            53       NA       NA       NA       NA
    NA        NA
           NPU_0_T8                            50       NA       NA       NA       NA
    NA        NA
           NPU_0_T9                            56       NA       NA       NA       NA
    NA        NA
           NPU_0_T10                           56       NA       NA       NA       NA
    NA        NA
           NPU_0_T11                           50       NA       NA       NA       NA
    NA        NA
           NPU_0_T12                           57       NA       NA       NA       NA
    NA        NA
           NPU_0_T13                           53       NA       NA       NA       NA
    NA        NA
           NPU_0_T14                           50       NA       NA       NA       NA
    NA        NA
           NPU_0_T15                           51       NA       NA       NA       NA
    NA        NA
           NPU_0_T16                           53       NA       NA       NA       NA
    NA        NA
           NPU_0_T17                           50       NA       NA       NA       NA
    NA        NA
           NPU_0_T18                           51       NA       NA       NA       NA
    NA        NA
           NPU_0_T19                           51       NA       NA       NA       NA
    NA        NA
           NPU_0_T20                           51       NA       NA       NA       NA
    NA        NA
           NPU_HBM_0_T1                        49       NA       NA       NA       NA
    NA        NA
           NPU_HBM_0_T2                        49       NA       NA       NA       NA
    NA        NA
           NPU_HBM_0_T3                        47       NA       NA       NA       NA
    NA        NA
           NPU_HBM_0_T4                        49       NA       NA       NA       NA
    NA        NA
           MNP0_IFG_VDDH_I_T                   51      -10       -5        0      110
   115       125
           MNP0_IFG_VDDH_E_T                   49      -10       -5        0      110
   115       125
           MNP0_HBM_VDD_I_T                    51      -10       -5        0      110
   115       125
           MNP0_HBM_VDD_E_T                    47      -10       -5        0      110
   115       125
           MU101_ADC_A_T                       49      -10       -5        0       95
   100       105
           MU101_ADC_B_T                       49      -10       -5        0       95
   100       105
           MU101_ADC_C_T                       48      -10       -5        0       95
   100       105
           MU507_ADC_A_T                       48      -10       -5        0       95
   100       105
           MU507_ADC_B_T                       48      -10       -5        0       95
   100       105
           MU507_ADC_C_T                       48      -10       -5        0       95
   100       105
```

```
       MU369_ADC_A_T                          48       -10        -5         0        95
100      105
       MU369_ADC_B_T                          48       -10        -5         0        95
100      105
       CHAS_INLET_T_I_T                       57       -15       -10        -5        95
100      105
       MB_PORT_Sensor                         29       -15       -10        -5        42
 45       50
       CHAS_OUTLET_T_I_LEFT_T                 34       -15       -10        -5        70
 75       80
       CHAS_OUTLET_T_I_RIGHT_T                38       -15       -10        -5        70
 75       80
       SSD_TEMP_T                             51       -10         0         5        72
 75       83
     ! DIE_TEMP_PHY_0                     -1003       -10        -5         0       110
120      125
     ! DIE_TEMP_PHY_1                     -1003       -10        -5         0       110
120      125
     ! DIE_TEMP_PHY_2                     -1003       -10        -5         0       110
120      125
     ! DIE_TEMP_PHY_3                     -1003       -10        -5         0       110
120      125
     ! DIE_TEMP_PHY_4                     -1003       -10        -5         0       110
120      125
     ! DIE_TEMP_PHY_5                     -1003       -10        -5         0       110
120      125
     ! DIE_TEMP_PHY_6                     -1003       -10        -5         0       110
120      125
     ! DIE_TEMP_PHY_7                     -1003       -10        -5         0       110
120      125
       NPU_0_T0                               51        NA        NA        NA        NA
 NA       NA
       NPU_0_T1                               53        NA        NA        NA        NA
 NA       NA
       NPU_0_T2                               51        NA        NA        NA        NA
 NA       NA
       NPU_0_T3                               52        NA        NA        NA        NA
 NA       NA
       NPU_0_T4                               52        NA        NA        NA        NA
 NA       NA
       NPU_0_T5                               51        NA        NA        NA        NA
 NA       NA
       CTC_U24_DIE_T                          47       -10        -5         0       110
115      125
       CTC_Mid_Left_Temp_T                    52       -10        -5         0        80
 90       95
       CTC_Mid_Right_Temp_T                   52       -10        -5         0        80
 90       95
       LTC2979_A_TEMP_T                       46       -10         0         5        90
100      105
       LTC2979_B_TEMP_T                       46       -10         0         5        90
100      105
       FAN_Sensor                             49       -10         0         5        75
 80       85
       CPU_CORE_TEMP_0_T                      58       -10         0         5        90
 95      100
       CPU_CORE_TEMP_1_T                      57       -10         0         5        90
 95      100
       CPU_CORE_TEMP_2_T                      57       -10         0         5        90
 95      100
       CPU_CORE_TEMP_3_T                      57       -10         0         5        90
 95      100
       SODIMM_0_TEMP_T                        51       -10         0         5        85
 95      100
```

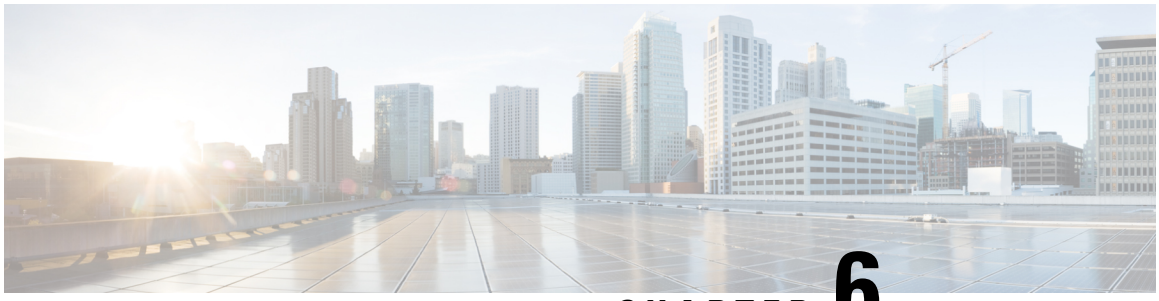
```
          SODIMM_1_TEMP_T                          51      -10         0         5        85
     95       100
          TI_2PLUS1_TEMP_T                         53      -10         0         5       110
   120        125
          TI_1PLUS1_TEMP_T                         52      -10         0         5       110
   120        125
          IOB Ambient Temp_T                       36      -10        -5         0        50
    55         60
Router#
```

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/CPU0sh
==============================================================================================================
Location  CURRENT                                  Value
          Sensor                                   (mA)
--------------------------------------------------------------------------------------------------------------
0/RP0/CPU0
          MNP0_IFG_VDDH_I                         12015
          MNP0_HBM_VDD_I                           2332
          12P0_NPU0_INA_VOUT_1_I                   5227
          12P0_OPT_L_INA_VOUT_I                    7517
          12P0_OPT_R_INA_VOUT_I                   10193
          12P0_CF_INA_VOUT_I                       9906
          12P0_GEN_INA_VOUT_I                      2344
          12P0_PHY_INA_VOUT_I                     30329
          VP0P75_PHY0_AVD_IAVG_I                  10688
          VP1P2_PHY0_AVD_IAVG_I                   14841
          NPU0_IFG_VDDA_0P75_IAVG_I               23258
          NPU0_VDDC_0P75_IAVG_I                  122638
          VP0P75_PHY0_CORE_IAVG_I                 19282
          QSFPDD0_IMON_I                           1778
          QSFPDD31_IMON_I                         73476
          NPU0_IFG_VDDS_0P65_IAVG_I               26058
          MP12P0_CF_I                              9840
          MP12P0_NPU0_I                            4600
          MP12P0_PHY_I                            30280
          MP12P0_OPT_R_I                          10100
          MP12P0_OPT_L_I                           7400
          MP12P0_GEN_I                             2310
          VP3P3_QSFPDD_0_I0                        3625
          VP3P3_QSFPDD_0_I1                        5125
          VP3P3_QSFPDD_1_I0                        7562
          VP3P3_QSFPDD_1_I1                        7562
          VP3P3_QSFPDD_2_I0                        8000
          VP3P3_QSFPDD_2_I1                        7187
          VP3P3_QSFPDD_3_I0                        9500
          VP3P3_QSFPDD_3_I1                       10062
          P12V_CPU_CARD_I                          2450
          CPU_CORE_CURRENT_I                      12062
          P1V05_SUS_CURRENT_I                      1783
          DDR4_CURRENT_I                          12046
          P1V05_IO_CURRENT_I                       1199
RP/0/RP0/CPU0:ios#
```

Note To manually configure the environmental altitude of the chassis, use the **environment altitude** command.



CHAPTER 6

Replace Chassis Components

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

Caution Whenever you replace any card, you must always ensure to secure the ejector thumbscrews properly.

Replace Modular Port Adapters

The following sections describe how to remove or install an MPA:

Remove a Modular Port Adapter

Before you begin:

Use one of the following procedures to perform graceful shutdown of the card:

- unscrew the captive screws, pull the release latch, and open ejector lever to trigger auto-shutdown of the card, and then verify that the Status LED is in Off state (The LED status transitions from Green to Red and Off which takes up to 5 seconds).
- use the **shutdown location** *location* command in admin EXEC mode to shutdown the card. Then use the **show platform** command to verify that the Status LED is in Off state.

To remove an MPA, perform the following steps:

1. Perform the graceful shutdown of the MPA. Run the **shutdown location** *location* command in admin EXEC mode, which gracefully shuts down MPA to prevent any of the file systems from being corrupted.

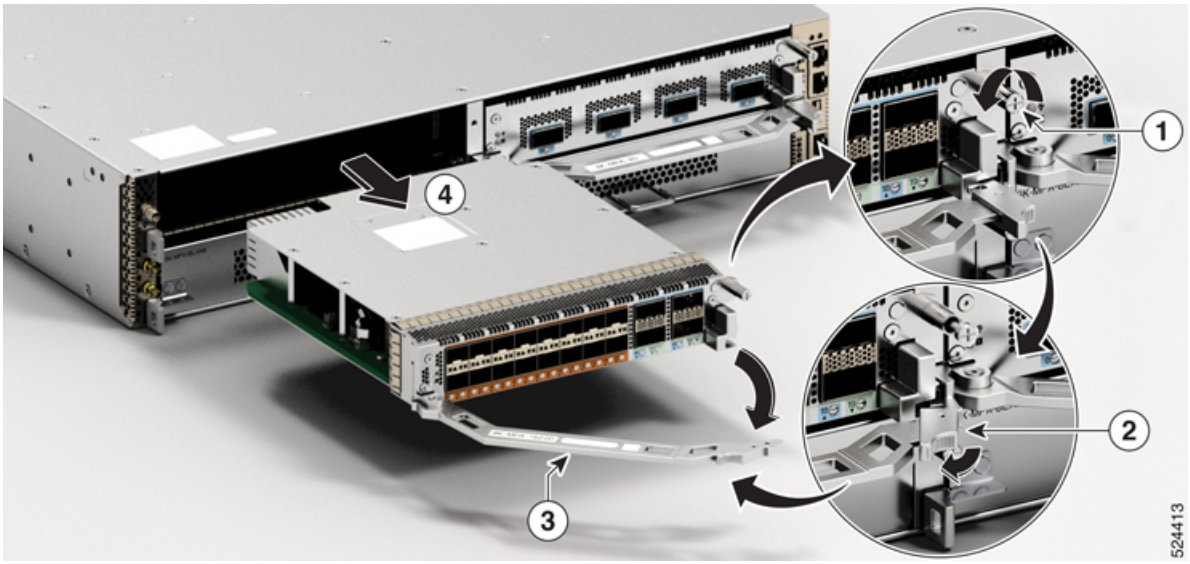
2. Verify that the MPA Status LED for the slot that you specified turns off. Also, you can verify that the card is in the powered off state by running the **show platform** command.
3. To remove the MPA from the chassis, loosen the captive screws (marked as 1 in the image) on the MPA.
4. Press the tab down (marked as 2 in the image).

Note If you are removing the MPA without shutting it down gracefully, verify that the Status LED is in an Off state before proceeding to the next step.

5. Pull the ejector lever away from the MPA (marked as 3 in the image).
6. Grasp the MPA and pull the MPA from the chassis (marked as 4 in the image). (You have already disconnected the cables from the MPA.

1	Rotate the captive screw to loosen the MPA.	2	Press the tab down.
3	Pull the ejector lever away from the MPA.		

Figure 74: Cisco 8712-MOD-M Router - Remove Modular Port Adapter



7. Proceed with installing an MPA.

Install a Modular Port Adapter

This section provides step-by-step instructions for installing a modular port adapter (MPA) in a Cisco 8700 Series router.

To install an MPA, perform the following steps:

1. To insert the MPA, locate the guide rails inside the chassis that hold the MPA in place.

2. Carefully slide the MPA all the way in the chassis until the MPA is firmly seated in the MPA interface connector. When fully seated, the MPA might be slightly behind the faceplate.

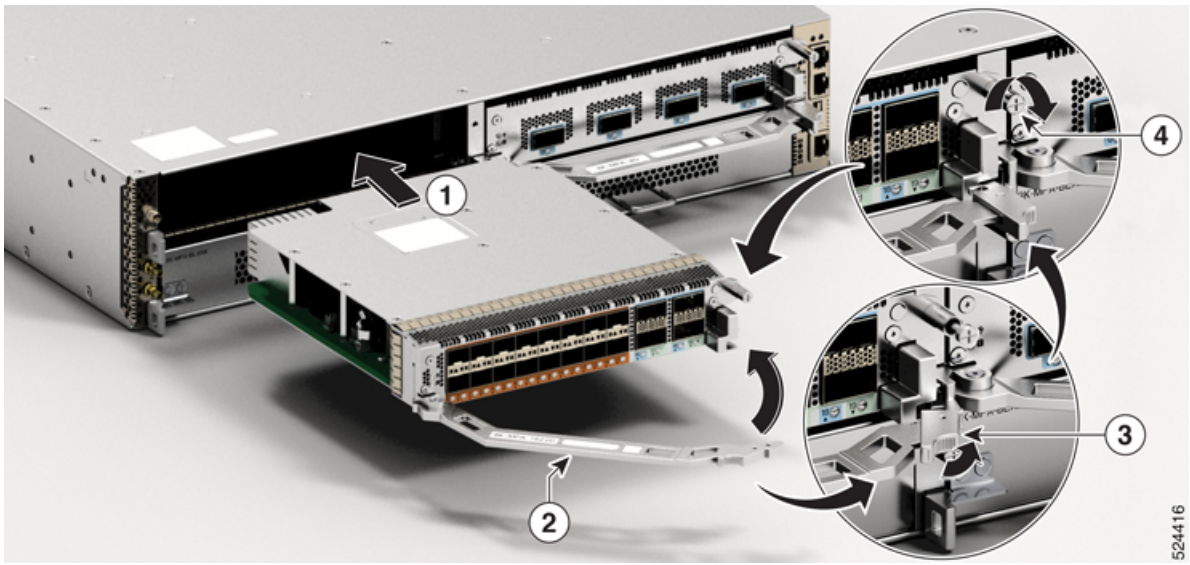
Note The MPA will slide easily into the slot if it is properly aligned on the tracks. If the MPA does not slide easily, do NOT force it. Remove the MPA and reposition it, paying close attention to engaging it on the tracks. Push the MPA inside the slot until you hear a click. Continue to push the MPA further until you hear a second click. The MPA is fully seated only after the second click is heard.

3. After the MPA is properly seated, push the ejector lever towards the chassis (marked as 2 in the image).

Note If the ejector is not closed within 60 seconds and remains open for an extended period, the router will automatically shut down the MPA due to the open ejector status. When this occurs, the LED status will change from Amber to Off as the MPA shuts down. After the MPA has shut down, you can safely remove it from the slot, reinsert it, and lock the ejector. The MPA will then return to its standard workflow and become operational again. Once the MPA is operational, the LED status will change to Green.

4. Pull the tab up (marked as 3 in the image).
5. Use a number 2 Phillips screwdriver to tighten the captive screws (marked as 4 in the image) on the MPA.

Figure 75: Cisco 8712-MOD-M Router - Install Modular Port Adapter



1	Slide the back end of the MPA into the open MPA slot.	2	Pull the ejector lever towards the MPA.
3	Pull the tab up.	4	Rotate the captive screw to tighten the MPA.

Note Do not over-torque the MPA captive screws when installing the MPA. Tighten the captive screws on the MPA to a torque of 9.7 in-lbs (1.09 N-m).

Replace Blank Cards

The following sections describe how to remove or install a blank card:

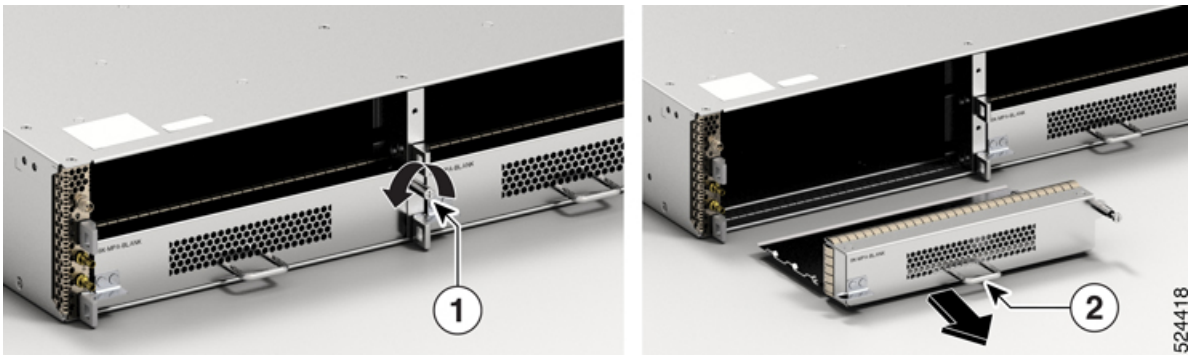
Remove a Blank Card

To remove a blank card, perform the following steps:

1. To remove the blank card from the chassis, loosen the captive screws (marked as 1 in the image) on the blank card.
2. Secure the handle on the faceplate and then extract the blank card (marked as 2 in the image).

1	Rotate the captive screw to loosen the blank card.	2	Secure the handle on the faceplate and then extract the blank card..

Figure 76: Cisco 8712-MOD-M Router - Remove Blank Card



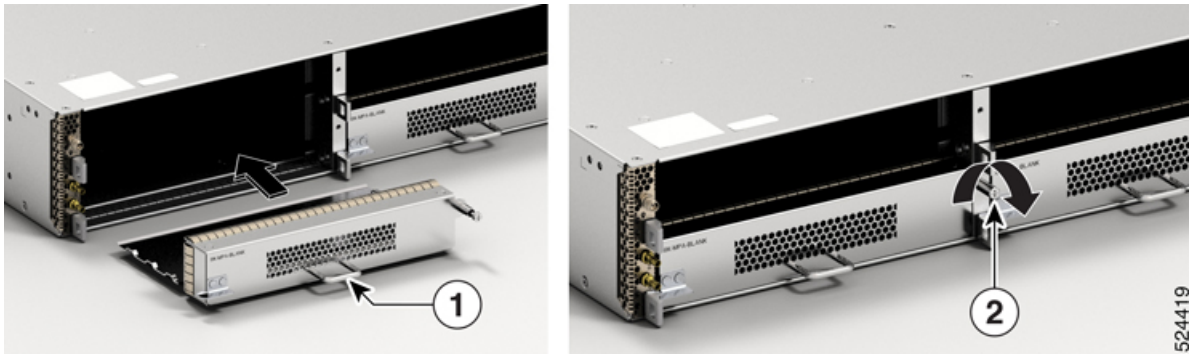
3. Proceed with installing an MPA.

Install a Blank Card

The empty MPA slots in the 8712-MOD-M router disrupt the airflow balance. To maintain the airflow balance, insert blank cards into the empty MPA slots. To install a blank card, perform the following steps:

1. To insert the blank, slide the back end of the blank card into the open MPA slot.
2. After the blank card is properly seated, rotate the captive screw to tighten the blank card. (marked as 2 in the image).

Figure 77: Cisco 8712-MOD-M Router - Install Blank Card



1	Slide the back end of the blank card into the open MPA slot.	2	Rotate the captive screw to tighten the blank card.

Note Do not over-torque the blank card captive screws when installing the blank card. Tighten the captive screws on the blank card to a torque of 9.7 in-lbs (1.09 N-m).

Replace Fan Modules

The fan module is designed to be removed and replaced while the system is operating without presenting an electrical hazard or damage to the system. Please keep the replacement fan modules ready prior to attempting this task.

The router supports the following types of fan modules:

- Cisco 8711-32FH-M Router
  - port-side intake airflow - FAN-1RU-PI-V2
  - port-side exhaust airflow - FAN-1RU-PE-V2
- Cisco 8712-MOD-M Router
  - port-side intake airflow - FAN-PI-V3
  - port-side exhaust airflow - FAN-PE-V3

Note The airflow direction must be the same for all power supply and fan modules in the chassis. Depending upon the required airflow direction, you can change the fan type. You must then also change the power supply.

Procedure

Step 1 To remove a fan module, follow these steps:

a) Press two latches on the fan module and grasp the handle of fan module.

Figure 78: Cisco 8711-32FH-M Router — Remove Fans

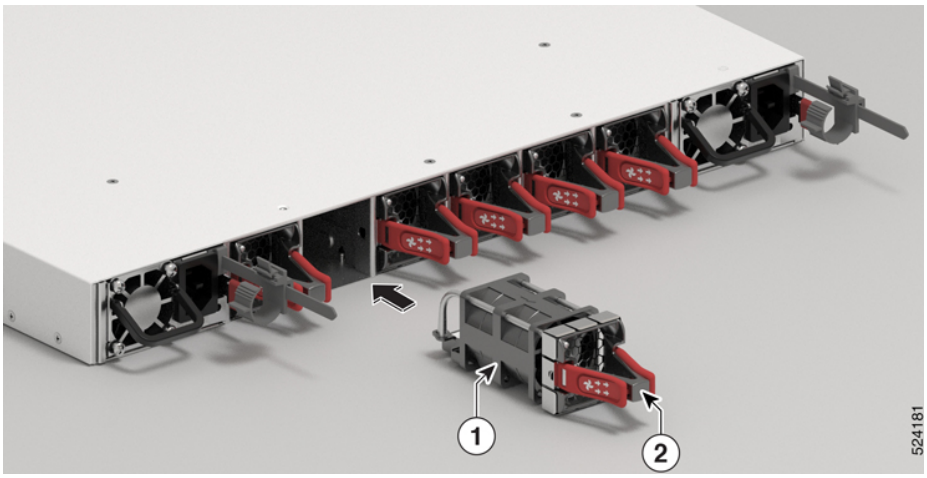
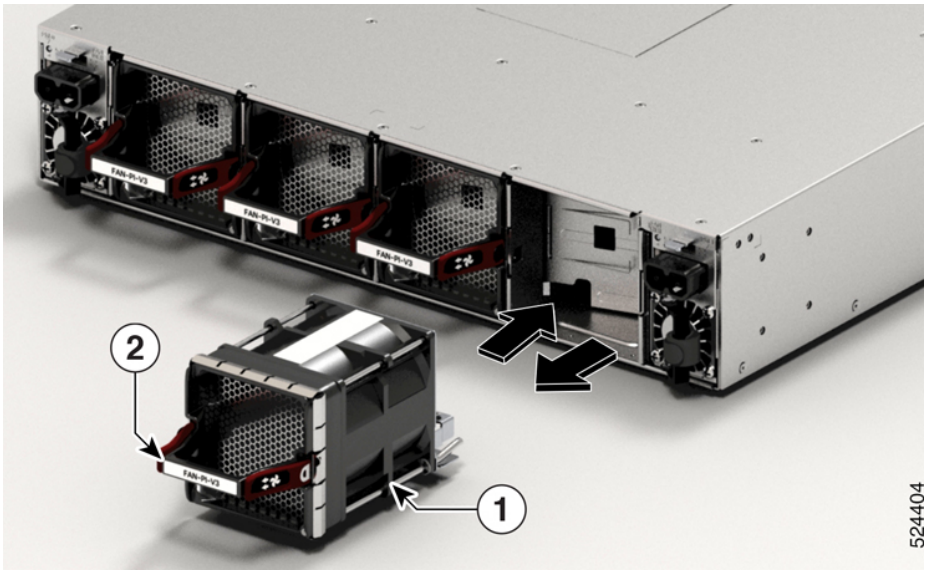


Figure 79: Cisco 8712-MOD-M Router — Remove Fans



1	Latched fan module	2	Fan latch

b) As you simultaneously press the latches pull the fan module fully out of the chassis.

Step 2 To install a fan module, follow these steps:

a) Hold the fan module with the LED at the top.

b) Align the fan module to the open fan tray slot in the chassis, and press the module all the way into the slot until the left and right latches click and are locked on the chassis.

Note
If the fan module does not go all the way into the slot, do not force it. Remove the fan module and verify that it is the correct type for your router and in the correct orientation. To verify the status of fans and the speed, use the **show environment fan** command.

c) If the chassis is powered on, listen for the sound of the fans in operation. You should immediately hear them in operation. If you do not hear them, ensure that the fan module is inserted completely in the chassis.

Note
During the fan module replacement, the other fans adjust their speed to allow for proper initialization of the new module. When you insert a new fan module, the fans may run at lower or higher speeds for a few minutes.

d) Verify that the fan module LED turns green. If the LED is not green, one or more fans are faulty. If this situation occurs, contact your customer service representative for replacement parts.

Replace Power Supply

Note We recommend that you occupy both the power supply slots of the fixed port routers with power supplies. In case a power module fails, it is recommended to retain the failed power module in its slot until it is replaced with a new power module. This recommendation ensures that the system airflow is not impacted adversely, which may then result in the overheating of the router and its components.

When there are two PSUs in the router, use the following steps to replace the PSUs (AC to DC or vice-versa. Routers can operate normally only with the same type of PSU in both the power slots. During replacement of PSU from one type to another, the router exhibits unexpected behaviour and the Cisco IOS XR software raises the PID mismatch alarm due to the presence of different types of PSUs. You must therefore replace the PSUs in both slots with the same type.

Power down the fixed configuration Power Distribution Unit (PDU) before removing the PDU from the chassis.

Procedure

Step 1 Ensure that both the PSUs are powered off.

Step 2 If the power supply is connected to an AC or DC circuit, shut off the circuit at the circuit breaker or PDU.

Step 3 Disconnect the power cable of the PSU that must be replaced.

Note
To remove the Saf-D-Grid power cord (AC or HVDC) or the low voltage DC power cord from the power supply, press the latch before pulling the power cord out.

Step 4 Press the tab inward to unlatch the PSU, and pull the handle to remove the PSU.

Step 5 Insert the new PSU.

Note
If the PSU does not go all the way into the slot, do not force it. Remove the PSU and verify that it is the correct type for your router and in the correct orientation.

Step 6 Connect the PSU cable. If the power supply is connected to an AC or DC circuit, turn on the circuit at the circuit breaker or PDU.source. Wait till the PSU LED color turns green. After replacing the PSU, verify the power using the **show environment power** command.

Step 7 Repeat steps 1 through 6 to replace the PSU in the second slot.

Figure 80: Cisco 8711-32FH Router — Remove Power Supply

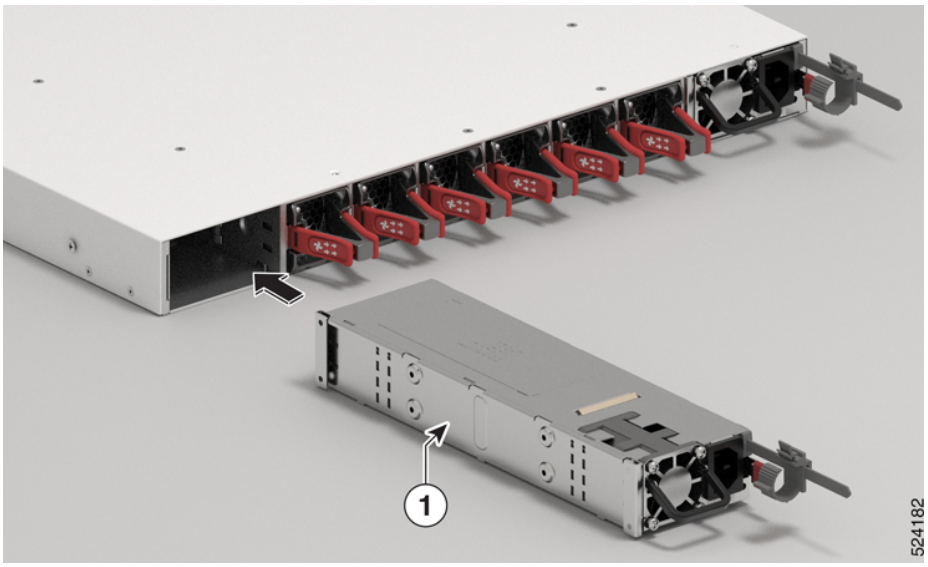
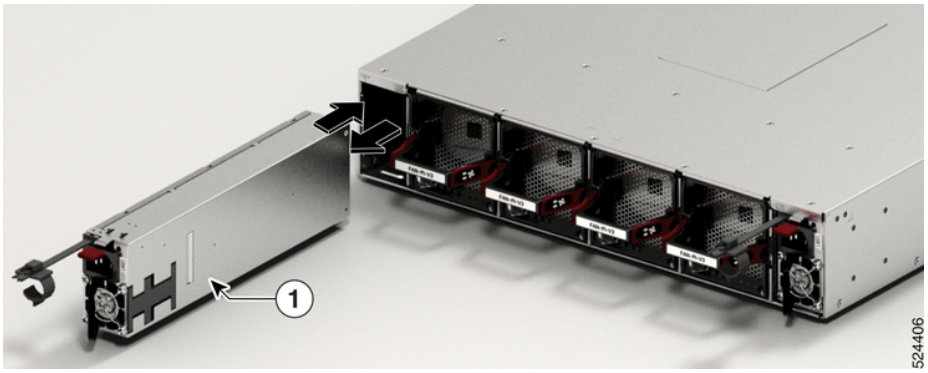
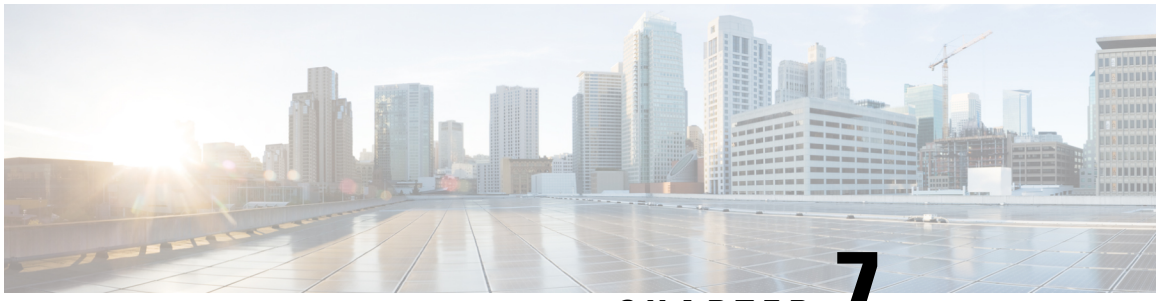


Figure 81: Cisco 8712-MOD-M Router — Remove Power Supply



1	Remove power supply



CHAPTER 7

LEDs

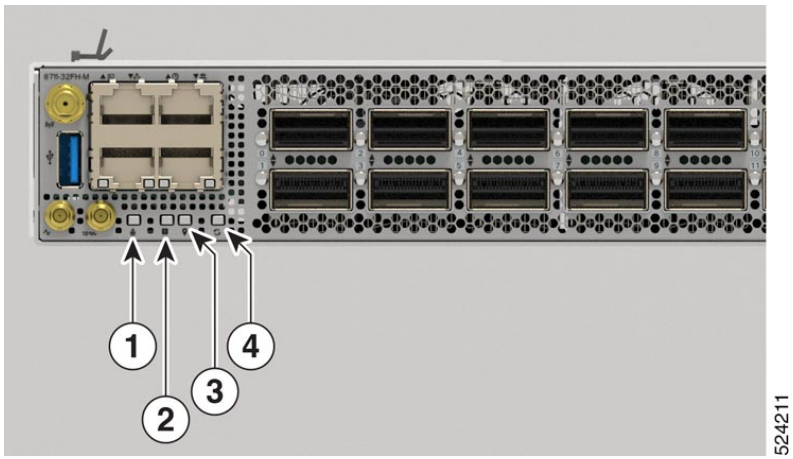
You can perform the following check on LEDs that assist you with the troubleshooting process:

LEDs for Cisco 8711-32FH-M Router

Chassis LEDs

Attention, Status, Synchronization, and GPS LEDs are located both at the far left of the front of the chassis and also on the back of the chassis:

Figure 82: Chassis LEDs - Front View of Cisco 8711-32FH-M



1	Attention
2	Status
3	GPS

4	Synchronization

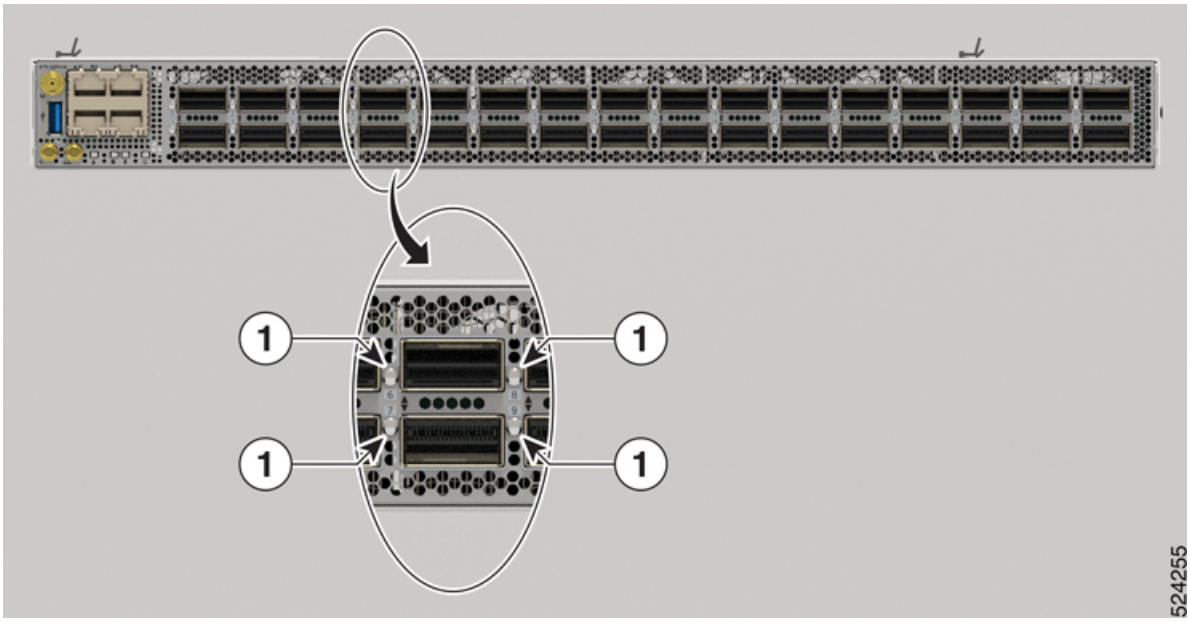
Table 16: Chassis LED Descriptions

LED	Color	Status
Attention 	Flashing blue	The operator has activated this LED to identify this chassis.
	Off	This chassis is not being identified.
Status 	Green	The module is operational and has no active major or critical alarms.
	Flashing Green	The auto or manual FPD upgrade is in progress.
	Amber	The module is in one of the following states: • Power cycle • Reload or reimage • Shutdown
	Flashing Amber	The module has minor alarm.
	Red	Power-up failure which prevents the CPU from booting.
	Flashing Red	The module has active major or critical alarms.
	Off	The module is powered-off.
GPS 	Green	The GPS interface is provisioned and frequency, time of day and phase inputs are all operating correctly.
	Off	The GPS interface is not provisioned, or the GPS inputs are not working correctly.
Synchronization 	Green	Time core is synchronized to an external source including IEEE1588.
	Amber	The system is running in holdover or free-run mode and it is not synchronized to an external interface.
	Off	The centralized frequency or time and phase distribution is not enabled.

Port Status LEDs

Each port has an LED. The following table describes port status LEDs.

Figure 83: Port Status LED - Cisco 8711-32FH-M Chassis



1	400G Port Status LED

Table 17: Port Status LEDs (one per port)

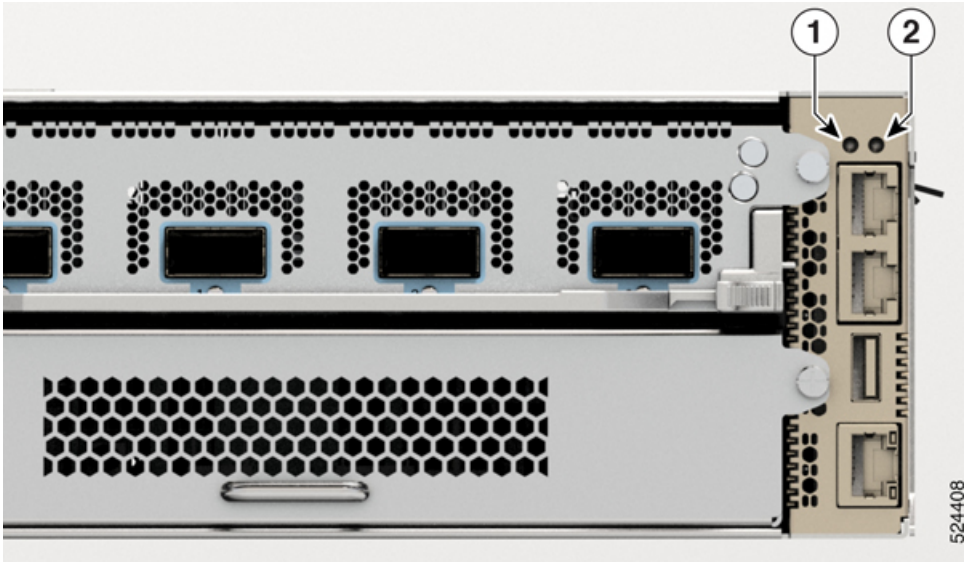
LED Color	Description
Off	Port is administratively shut down.
Amber	Port is administratively enabled and the link is down.
Green	Port is administratively enabled and the link is up.

LEDs for Cisco 8712 Router

Chassis LED

This section describes the chassis LED and its status.

Figure 84: Chassis LEDs - Front View of Cisco 8712-MOD-M



1	Attention
2	Status

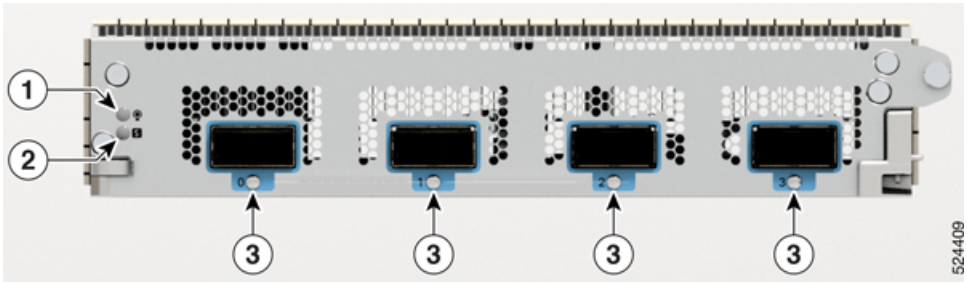
Table 18: Chassis LED Descriptions

LED	Color	Status
Attention 	Flashing Blue	The operator has activated this LED to identify this chassis.
	Off	The operator has not activated this LED.

MPA LEDs

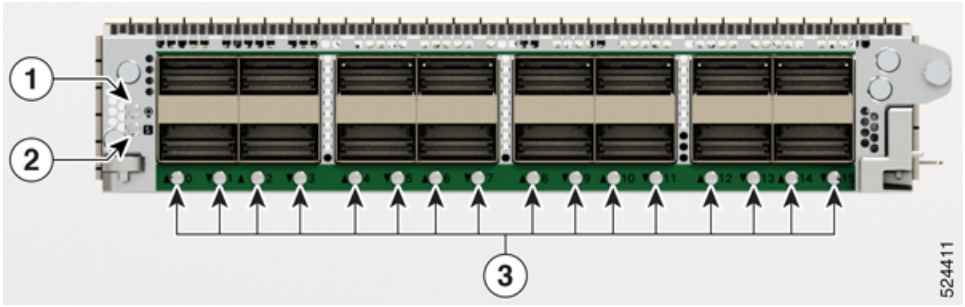
The Status LED and the Attention LED are located on the bottom of the MPA. The Link LEDs for each port are located on the right-side of the MPA, next to the ejector lever.

MPA LEDs - 8K-MPA-4D



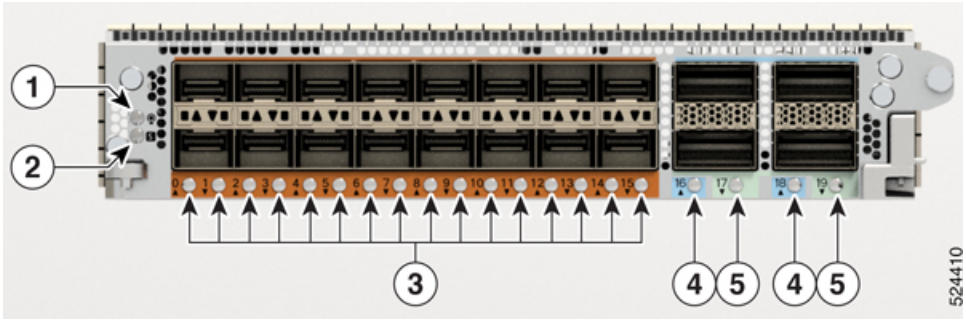
1	Attention
2	Status
3	Port Link

MPA LEDs - 8K-MPA-16H



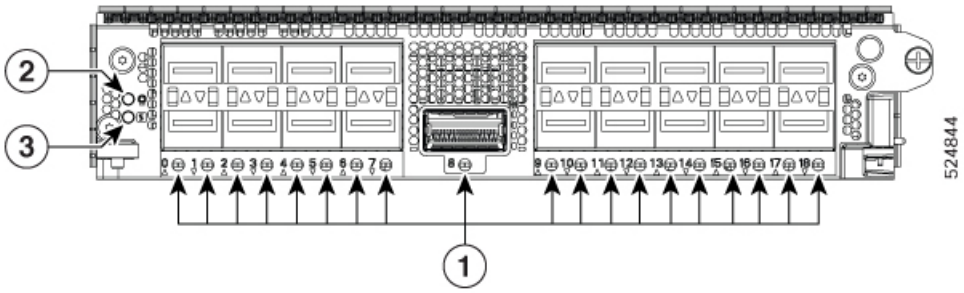
1	Attention
2	Status
3	Port Link

MPA LEDs - 8K-MPA-16Z2D



1	Attention
2	Status
3	Link (Port 0-15)
4	Link (Port 16 and 18)
5	Link (Port 17 and 19)

MPA LEDs - 8K-MPA-18Z1D



1	Port Link
2	Attention
3	Status

Table 19: MPA LED Descriptions

LED	Color	Status
Attention	Flashing Blue	The operator has activated this LED to identify this module in the chassis.
	Off	This module is not identified by the operator.

LED	Color	Status
Status	Solid Amber	The module is in one of the following states: • Booting up • Shutting down • Power cycling
	Solid Green	The module is operational with no issues.
	Solid Red	The module has failed to power-up
	Flashing Green	Auto or manual FPD upgrade is in-progress.
	Flashing Red	The module has an active major or critical alarm.
	Flashing Amber	The module has an active minor alarm.
	Off	The module is in one of the following states: • The module is in shutdown state by using either **shutdown location** *location* command in the EXEC mode or by using the **hw-module shutdown location** *location* command in the Config mode. • While the card is in running state, the ejector lever is opened that triggers the auto-shutdown operation for the module. • The module is placed in shutdown state by the software due to a hardware fault or a critical alarm condition. **Note** While in this state, the module can be safely removed from the router.
Port (for each port)	Green	The port is administratively enabled and the link is up.
	Amber	The port is administratively enabled and the link is down.
	Off	The port is administratively shut down.

Fan LED

Fan modules are located on the back of the chassis. Each fan module has a Status LED.

Figure 85: Fan LED - Cisco 8711-32FH-M Chassis

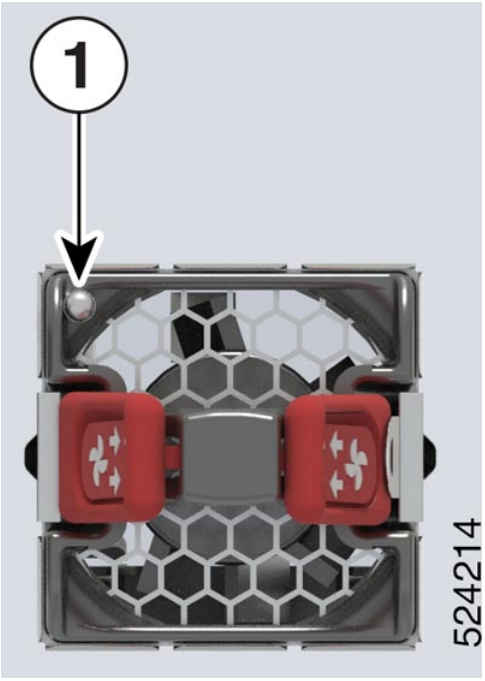
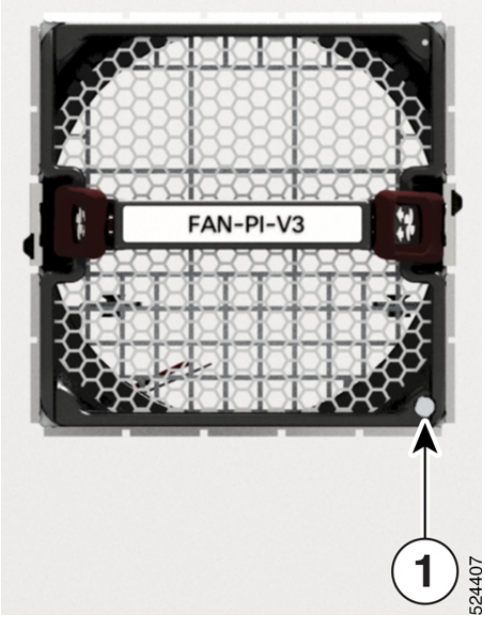


Figure 86: Fan LED - Cisco 8712-MOD-M Chassis



1	Fan Status LED

Table 20: Fan LED Descriptions

LED	Color	Status
Status	Green	Fan is operating normally.
	Amber	Fan is inserted and pending to come online.
	Flashing Amber	The module is in one of these states: • Fan speed (RPM) is outside normal range. • The module has a minor, major, or critical alarm.
	Flashing Blue	The module is identified or activated.
	Off	Fan is not receiving power.

Power Supply LEDs

Power modules are located on the back side of the chassis. Each power module has a Status LED.

Figure 87: Cisco 8711-32FH-M Power Supply LED

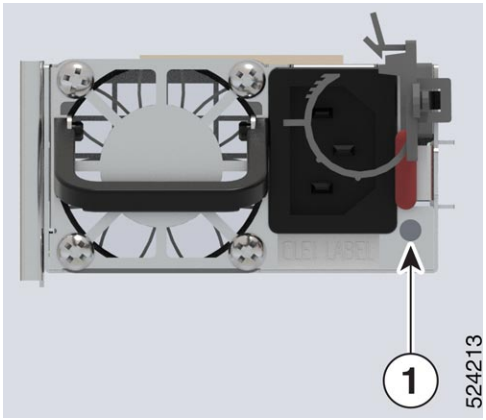


Figure 88: Cisco 8712-MOD-M DC Power Supply LED

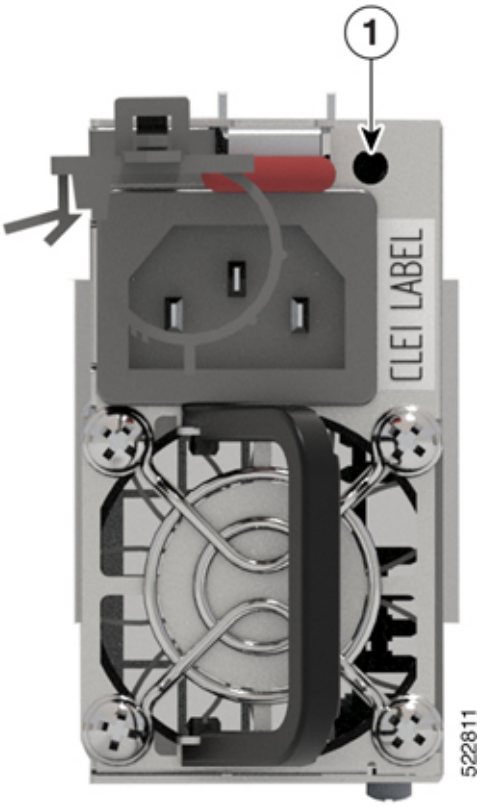


Figure 89: Cisco 8712-MOD-M AC Power Supply LED

1	Status LED

Table 21: Power Supply LED Descriptions

LED	Color	Status
Status	Green	Power supply is on and transmitting power to the router.
	Flashing Green (2 Hz)	Power supply is connected to input power source but not transmitting power to the router.
	Flashing Green (4 Hz)	Power Supply Unit firmwire upgrade in-progress.
	Amber	Power supply failure, due to one of these conditions: • Over voltage • Over current • Over temperature • Fan failure
	Flashing Amber (1 Hz)	Power supply is operating but a warning condition has occurred, due to one of these conditions: • High temperature • High power • Slow fan
	Off	Power supply units are not receiving power.