

Hardware Installation Guide for Cisco 8200 Series Routers

First Published: 2020-08-15

Last Modified: 2026-03-19

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

© 2020 Cisco Systems, Inc. All rights reserved.



CONTENTS

CHAPTER 1 **Cisco 8200 Series Routers Overview** 1

Cisco 8200 Series Routers 1

CHAPTER 2 **Prepare for Installation** 5

Safety Guidelines 6

Compliance and Safety Information 6

Laser Safety 8

Energy Hazard 8

Preventing Electrostatic Discharge Damage 9

Cautions and regulatory compliance statements for NEBS 9

Installation Guidelines 11

Procure Tools and Equipment 11

Router Accessory Kit 12

Router Air Filter Kit 13

Prepare Your Location 13

Prepare Yourself 14

Prepare Rack for Chassis Installation 15

Clearance Requirements 17

CHAPTER 3 **Installing the Chassis** 19

Rack Mount the Chassis 19

Rack-Mount the Chassis in a 4-Post Rack 20

Rack-Mount the Chassis in a 2-Post Rack 28

Installing a Cable Management Bracket 37

Install the Air Filter 38

Install the Air Filter on the Port Side Inlet 39

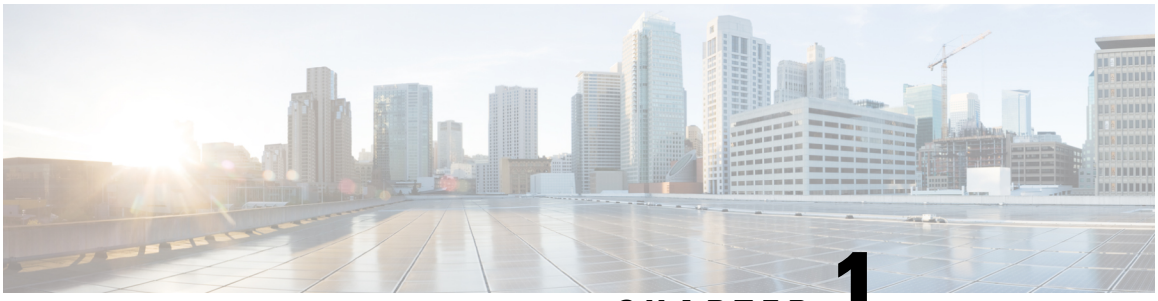
Install the Air Filter on the Port Side Exhaust 40
Install the Air Filter on the Port Side Inlet for Cisco 8202-32FH-M and Cisco 8212-48FH-M Chassis 41
Ground the Chassis 42
Power Supply Unit Input and Output Ranges 47
Connect AC Power to the Chassis 49
AC-Input Power Cord Options 50
Connect DC Power to Chassis 60
Connect High Voltage Power Supply Unit to Power Source 64

CHAPTER 4 **Connect Router to the Network** 67
Port Connection Guidelines 67
Interfaces and Port Description 68
Connecting a Console to the Switch 76
Create the Initial Router Configuration 78
Connect the Management Interface 80
Install Dust Caps 80
Install and Remove Transceiver Modules 81
Install and Remove QSFP Transceiver Modules 81
Required Tools and Equipment 82
Installing the Transceiver Module 82
Attach the Optical Network Cable 85
Removing the Transceiver Module 87
Connect Interface Ports 89
Connect a Fiber-Optic Port to the Network 89
Disconnect Optical Ports from the Network 89
Maintain Transceivers and Optical Cables 89
Verify Chassis Installation 89

CHAPTER 5 **Replace Chassis Components** 91
Replace the Latched Fan Modules 91
Replace Fan Modules for Cisco 8202 Router 95
Replace Fan Modules for Cisco 8202-32FH-M Router or Cisco 8212-48FH-M Router 96
Remove SSD Card 98

Replace AC, HVAC, or HVDC Power Supply 99
Replace Low Voltage DC Power Supply 103
DIMM Upgrade Procedure 107
Upgrading the Memory 109

CHAPTER 6 LEDs 115
Chassis LEDs 115
Fan Tray LED 119
Power Supply LEDs 121
Port Status LEDs 125



CHAPTER 1

Cisco 8200 Series Routers Overview

- Cisco 8200 Series Routers, on page 1

Cisco 8200 Series Routers

Table 1: Feature History Table

Hardware Name	Release	Description
Cisco 8201-24H8FH Router	Release 7.7.1	These are fixed-port, high-density, 1RU form-factor routers that support 24 QSFP28 100 GbE ports and 8 QSFP-DD 400 GbE ports. It provides 5.6Tbps of network bandwidth.
PSU3KW-HVPI Power Supply Unit for the Cisco 8202-32FH-M Router	Release 7.5.3	We are now introducing a high voltage power supply unit, PSU3KW-HVPI that accepts AC, HVAC, or HVDC input power to operate the Cisco 8202-32FH-M router in the port side intake configuration. The PSU3KW-HVPI power supply unit has a maximum power of 1500W (AC low line) or 3000W (HVAC or HVDC). The benefits of the PSU3KW-HVPI PSU are: • Supports HVDC and HVAC input power • Helps when transceivers are installed in the router which needs more power to operate • Provides better efficiency for power distribution

Hardware Name	Release	Description
Cisco 8202-32FH-M and Cisco 8202-32FH-MO Routers	Release 7.5.2	These are fixed-port, high-density, 2RU form-factor routers with MACsec that support 32-ports of 400 GbE. These routers consume low power for efficient cooling and can scale to the increasing bandwidth and scale requirements. The 8202-32FH-MO variant supports Cisco-qualified open-source network operating systems, such as SONiC (Software for Open Networking in the Cloud).
Cisco 8201-32FH Router	Release 7.3.15	With this release, Cisco introduces another chassis in the 8200 Series Routers. It provides 12.8Tbps of network bandwidth. The Cisco 8201-32FH Router is a fixed port, high density, one rack unit form-factor router. This router has 32 QSFP56-DD 400 GbE ports.
Cisco 8212-48FH-M Router	Release 24.3.1	With this release, Cisco introduces another chassis in the 8200 Series Routers. It provides 19.2Tbps of network bandwidth. The Cisco 8212-48FH-M Router is a fixed port, high density, 2RU form-factor router and features 24 QSFP56-DD ports and 24 QSFP-DD800 ports. The Cisco 8212-48FH-M Router comes with HBM/2.5D and MACsec support.

Hardware Name	Release	Description
PSU3KW-DCPI Power Supply Unit for the Cisco 8202-32FH-M and Cisco 8212-48FH-M Routers	Release 24.3.1	We are now introducing a high wattage DC power supply unit, PSU3KW-DCPI that accepts DC power to operate the Cisco 8202-32FH-M and Cisco 8212-48FH-M routers in the port side intake configuration. The PSU3KW-DCPI power supply unit has a maximum power of 3000W. The benefits of the PSU3KW-DCPI PSU are: • Supports DC input power. It usually supports a wide range of input voltages, often from -48V to -60V DC, making it suitable for use in different regions and environments. • Helps when transceivers are installed in the router which needs more power to operate • Provides better efficiency for power distribution

The Cisco 8200 Series Routers utilizes Cisco's new Router-on-Chip (RoC) model to deliver full routing functionality with a single ASIC per router. The RoC architecture is distinguished from System-on-Chip (SoC) switches by supporting large forwarding tables, deep buffers, more flexible packet operations, and enhanced programmability.

The Cisco 8200 series routers presently comprises:

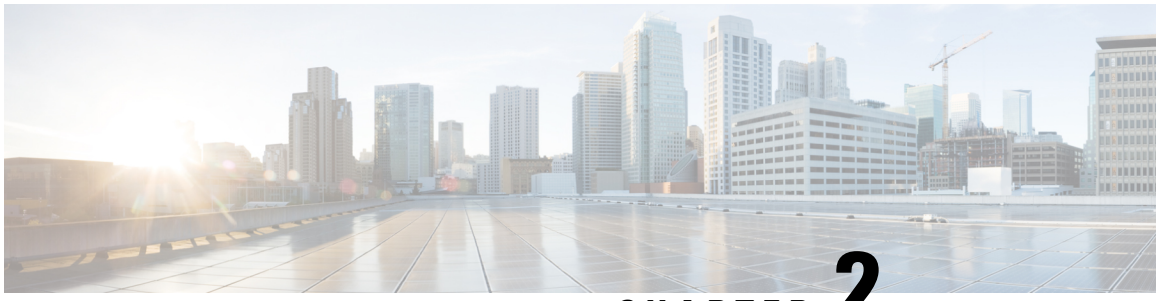
- Cisco 8201 Router – It provides 10.8 Tbps of network bandwidth with dramatically lower power consumption than contemporary 10 Tbps systems. The Cisco 8201 Router is a fixed port, high density, one rack unit form-factor router. Supported ports include 24x 400G QSFP-DD and 12x 100G QSFP28. For more details on ports and supported breakout options, see "Interfaces and Port Description, on page 68".
- Cisco 8202 Router – It provides 10.8 Tbps of network bandwidth with dramatically lower power consumption than contemporary 10 Tbps systems. The Cisco 8202 Router is a fixed port, high density, two rack unit form-factor router. Supported ports include 12x400 GbE QSFP-DD and 60x100 GbE QSFP28. For more details on ports and supported breakout options, see "Interfaces and Port Description, on page 68".
- Cisco 8201-32FH Router - It provides 12.8Tbps of network bandwidth. The Cisco 8201-32FH Router is a fixed port, high density, one rack unit form-factor router. Supported ports include 32 x 400G QSFP-DD. The Cisco 8201-32FH Router comes in the HBM/2.5D without MACsec variant(s).
- Cisco 8202-32FH-M - It provides 12.8Tbps of network bandwidth. The Cisco 8202-32FH-M Router is a fixed port, high density, two rack unit form-factor router. Supported ports include 32 x 400G QSFP-DD.

The Cisco 8202-32FH-M Router comes with HBM/2.5D and MACsec, and supports ZR/ZRP optical modules on all the ports.

- Cisco 8202-32FH-MO - It provides 12.8Tbps of network bandwidth. The Cisco 8202-32FH-MO Router is a fixed port, high density, two rack unit form-factor router. Supported ports include 32 x 400G QSFP-DD. The Cisco 8202-32FH-MO Router comes with HBM/2.5D and MACsec, and supports ZR/ZRP optical modules on all the ports. This variant supports the Cisco-qualified open-source network operating system, such as SONiC (Software for Open Networking in the Cloud). The functionality and installation of this router is similar to that of Cisco 8202-32FH-M.
- Cisco 8201-24H8FH Router - It provides 5.6Tbps of network bandwidth. The Cisco 8201-24H8FH Router is a fixed port, high density, one rack unit form-factor router. This router supports 24 QSFP28 100 GbE ports and 8 QSFP-DD 400 GbE ports. The Cisco 8201-24H8FH Router comes in the HBM/2.5D without MACsec variant(s).
- Cisco 8212-48FH-M Router - It provides 19.2Tbps of network bandwidth. The Cisco 8212-48FH-M Router is a fixed port, high density, 2RU form-factor router and features 24 QSFP56-DD ports and 24 QSFP-DD800 ports.

  The Cisco 8212-48FH-M Router comes with HBM/2.5D and MACsec support.

For more details on the Cisco 8200 series routers, see Cisco 8000 Series Routers Data Sheet.



CHAPTER 2

Prepare for Installation

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

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



- Safety Guidelines, on page 6
- Compliance and Safety Information, on page 6
- Laser Safety, on page 8
- Energy Hazard, on page 8
- Preventing Electrostatic Discharge Damage, on page 9
- Cautions and regulatory compliance statements for NEBS, on page 9
- Installation Guidelines, on page 11
- Procure Tools and Equipment, on page 11
- Prepare Your Location , on page 13
- Prepare Yourself , on page 14
- Prepare Rack for Chassis Installation, on page 15
- Clearance Requirements, on page 17

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 8100 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.

Note **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.

Warning

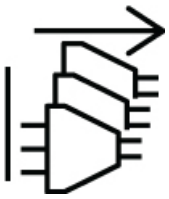
Statement 1005—Circuit Breaker

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:

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 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 9001—Product Disposal

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

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.

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.

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.

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.

Warning **Statement 1086—**Replace Cover on Power Terminals

Hazardous voltage or energy may be present on power terminals. To reduce the risk of electric shock, make sure the power terminal cover is in place when the power terminal is not being serviced. Be sure uninsulated conductors are not accessible when the cover is in place.

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.

Warning **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 as per the constellation used 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.

Note **Statement 7016—**Battery Return Conductor

The battery return conductor of this equipment shall be treated as (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 switche, 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 8100 Series Switches 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 8100 Series Switches function in operating temperatures of up to 40°C at sea level. For every 300 meters (1000 ft) above sea level, the maximum temperature is reduced by 1°C. For more details on environmental requirements, see Cisco 8100 Series Switches Data Sheet.

Note For fixed-port switches that support port side exhaust fans and power supplies, the maximum temperature is reduced by 5°C (for example, 35°C at sea level or 30°C at 1500 meters).

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 2 AWG lug (1) is provided with the accessory kit. If you choose to use a different sized ground wire, you must procure your own two-hole lug that has .25 inch holes and .625 inch spacing between the holes.
- Grounding cable sized according to local and national installation requirements; the required length depends on the proximity of the switch to proper grounding facilities. Cisco provides a 6 AWG lug.
- Crimping tool for lug.
- Wire-stripping tool.
- M4 screws to fix brackets (16).
- M4 screws to fix a ground lug (2).

Router Accessory Kit

The following table contains the router accessory kit PIDs. The router accessory kit contains the rack mount kit and the ground lug kit. The rack mount kit present in the accessory kit contains the screws and brackets required for installation.

Table 2: Router Accessory Kit

Router	Accessory Kit	Rack Depth Range
Cisco 8201 Router	8200-1RU-KIT	For rack depths between 25.82 in. (655.82 mm) and 32 in. (812.8 mm).
Cisco 8202 Router	8200-2RU-KIT	For rack depths between 25.30 in. (642.62 mm) and 34.30 in. (871.22 mm).
Cisco 8201-32FH and Cisco 8201-24H8FH Routers	8K-1RU-KIT-S	For rack depths between 23 in. (584.2 mm) and 32.29 in. (820.16 mm)
	8K-1RU-KIT-L	For rack depths between 32.40 in. (822.96 mm) and 42 in. (1066.8 mm)
Cisco 8202-32FH-M Router and Cisco 8212-48FH-M Router	8K-2RU-KIT-S	For rack depths between 23 in. (584.2 mm) and 32 in. (812.8 mm)
	8K-2RU-KIT-L	For rack depths between 32 in. (812.8 mm) and 42 in. (1066.8 mm)

Router Air Filter Kit

Note Air filters are for single time use only.

The following table contains the air filter PIDs and the items description for the Cisco 8202 series chassis:

Table 3: Router Air Filter Kits

Router	Air Filter Accessory Kit	Description
Cisco 8202 Router	8202-FILTER-PI	Port side air filter assembly for Port-Side-Intake configuration.
Cisco 8202 Router	FILTER-2RU-PE	Fan side air filter assembly for Port-Side-Exhaust configuration.
Cisco 8202-32FH-M Router	8K-2RU-FILTER	Port side air filter assembly for Port-Side-Intake configuration.
Cisco 8212-48FH-M Router	8K-2RU-FILTER	Port side air filter assembly for Port-Side-Intake configuration.

Note Only port-side intake air filter is available for the Cisco 8202-32FH-M and Cisco 8212-48FH-M chassis.

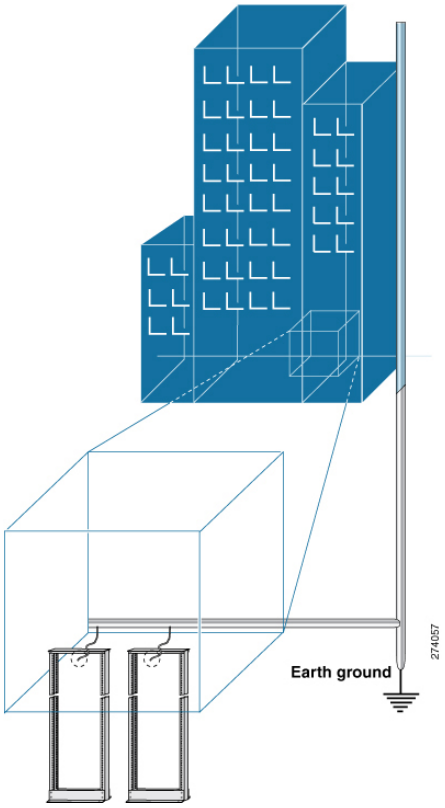
Prepare Your Location

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.

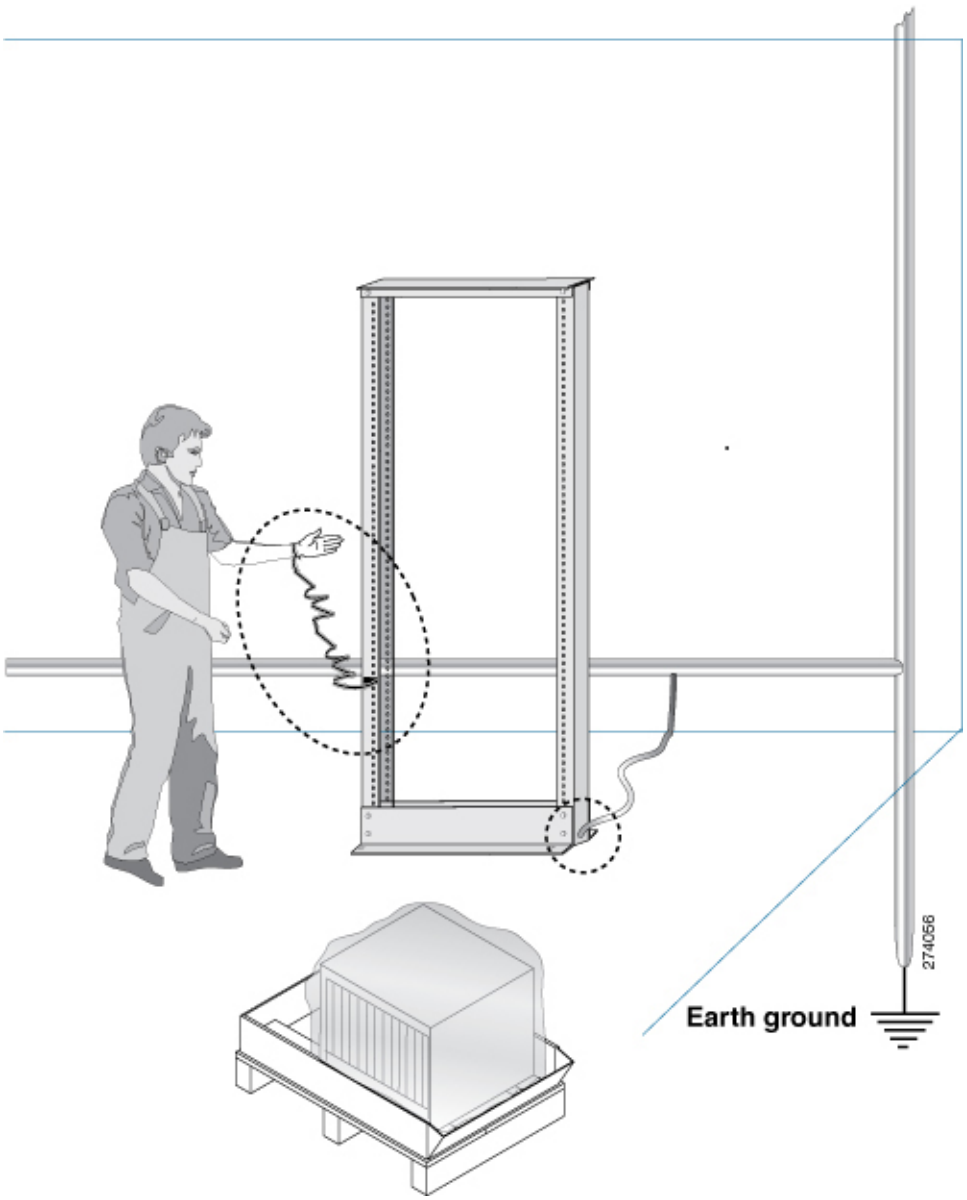
Figure 1: Building with Rack Room Connected to Earth Ground



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 2: Wearing the ESD Strap



Prepare Rack for Chassis Installation

Install the Cisco 8200 Series Routers on a standard 19 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 8201, Cisco 8202, Cisco 8201-32FH, Cisco 8201-24H8FH, Cisco 8202-32FH-M, and Cisco 8212-48FH-M router rack mount kit contains the rack mounting brackets for 19-inch rack. To install the chassis in a 23-inch rack or an ETSI rack, you need adapter plates 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 3: Rack Specification EIA (19 and 23 inches)

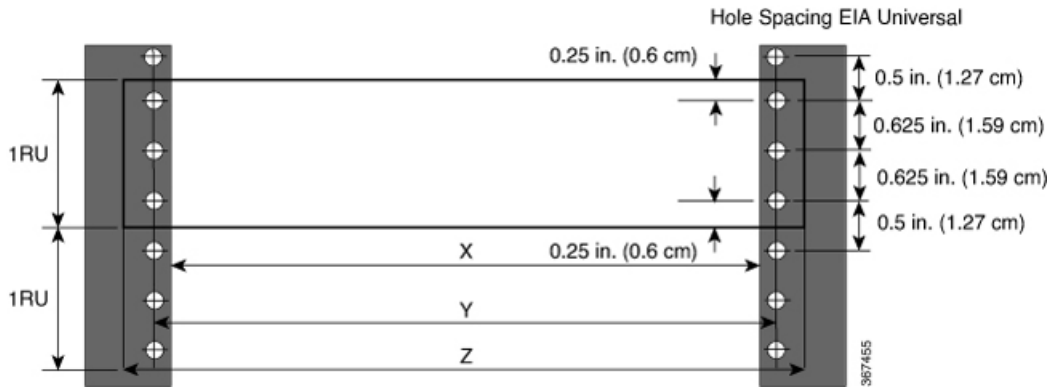


Table 4: Rack Specification EIA (19 and 23 inches)

Post Type	Rack Type	Rack Front Opening (X)	Rack Mounting Hole Center-Center (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). Make sure that floor mounting bolts are accessible, especially if annual retorquing of bolts is required.

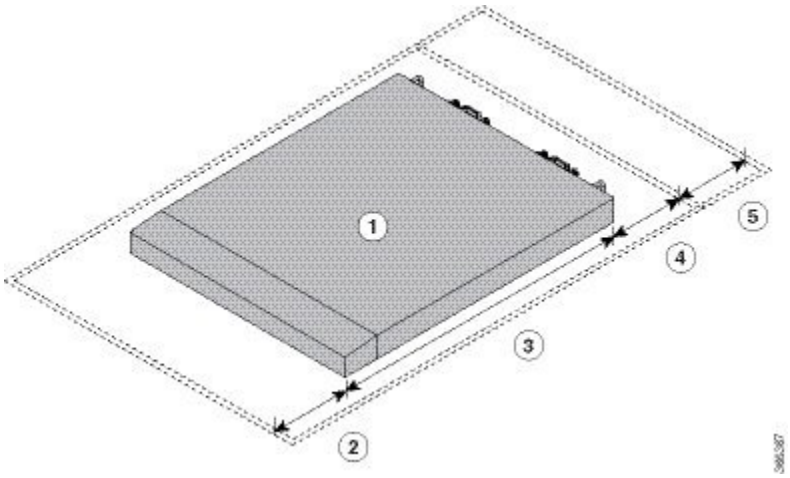
Note

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

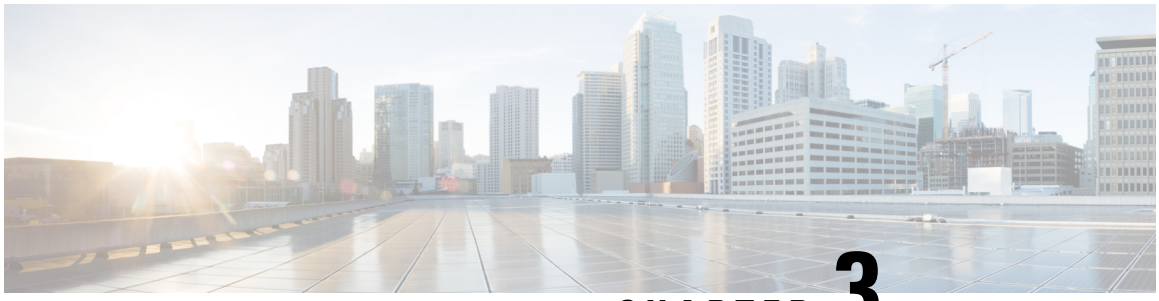
Clearance Requirements

The chassis requires front-to-back airflow. Leave at least 6.0 in. (15.24 cm) front and rear clearance for air intake or exhaust. We recommend that you have at least 6.0 in. (15.24 cm) of space in front of the chassis to provide room to maneuver the cables to make the required connections. Leave an extra 6.0 in. (15.24 cm) rear clearance for removal and installation of power supplies and fan modules.

Figure 4: Clearances Required Around the Chassis



1	Chassis	4	6.0 in. (15.24 cm) rear clearance for air intake/exhaust.
2	6.0 in. (15.24 cm) front clearance for air intake/exhaust.	5	Additional 6.0 in. (15.24 cm) rear clearance for removal and installation of power supplies and fan modules.
3	(8201-32FH, 8021-24H8FH, and 8212-48FH-M routers) 23.6 in. (59.94 cm) Chassis depth. (Other routers) 20.01 in. (50.82 cm) Chassis depth.		



CHAPTER 3

Installing the Chassis

- Rack Mount the Chassis, on page 19
- Installing a Cable Management Bracket, on page 37
- Install the Air Filter , on page 38
- Ground the Chassis, on page 42
- Power Supply Unit Input and Output Ranges, on page 47
- Connect AC Power to the Chassis, on page 49
- Connect DC Power to Chassis, on page 60
- Connect High Voltage Power Supply Unit to Power Source, on page 64

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.

Rack-Mount the Chassis in a 4-Post Rack

This section describes how to install the router in a 4-post 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 that are contained in the rack-mount kit.

Table 5: Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
18	M4 x 6-mm Phillips flat-head screws
2	M4 x 6-mm Phillips pan-head screws
2	Rack-mount guides
2	Rack-mount guide rails, 2 lengths for different 4-post depths
1	Grounding plate (applies to Cisco 8201, Cisco 8201-32FH, and Cisco 8201-24H8FH routers)
1	Grounding lug and screws

Procedure

Step 1 Install the rack-mount 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 (fan modules and power modules with burgundy coloring), position the router so that the ports are in the cold aisle.
- If the router has port-side exhaust modules (fan modules and power modules with blue coloring), position the router so that the fan and power supply modules are in the cold aisle.

b) (Only Cisco 8201, Cisco 8201-32FH, and Cisco 8201-24H8FH) Attach the grounding plate to the chassis. Use two M4 flat-head screws with 13.25 in-lbs (1.5 N-m) torque value to attach the grounding plate to the chassis.

Note
The Cisco 8201 chassis has a grounding cover label that must be removed before attaching the grounding plate to the chassis.

c) Position a rack-mount bracket on the side of the chassis with its four holes that are aligned to four of the screw holes on the side of the chassis, and then use four M4 flat-head screws with 13.25 in-lbs (1.5 N-m) torque value to attach the bracket to the chassis.

Note

You can align four holes in the rack-mount bracket to four screw holes on the front side of chassis or four screw holes on the rear side of the chassis. The holes that you use depend on which end of your chassis is located in the cold aisle.

Figure 5: Rack-Mount Brackets on Cisco 8201 Router—Port-Side Intake

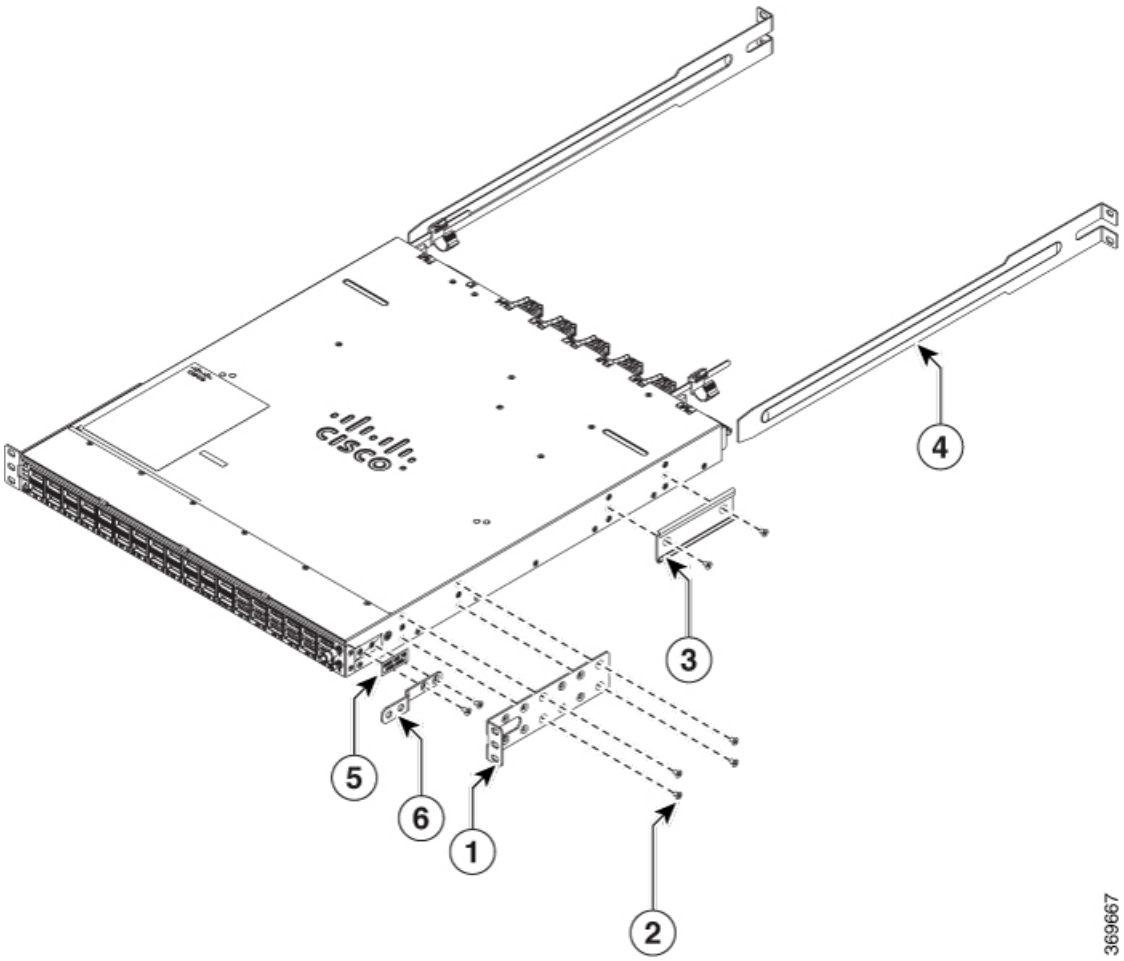
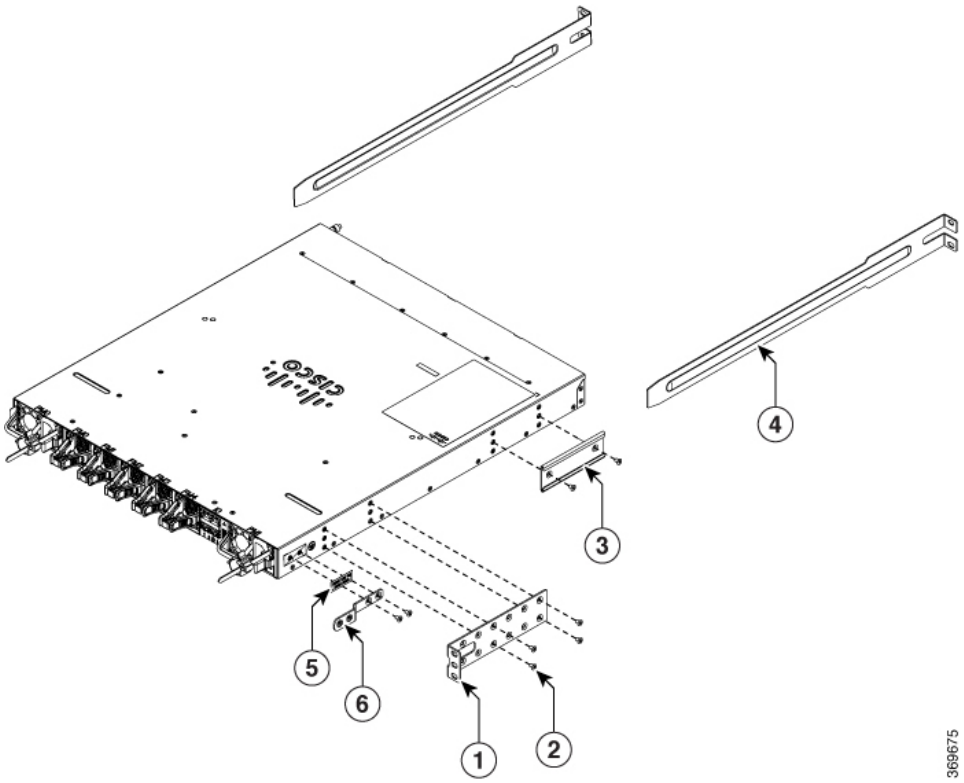


Figure 6: Rack-Mount Brackets on Cisco 8201 Router—Port-Side Exhaust



1	Rack-mount brackets	4	Rack-mount guide rails
2	M4 x 6mm Phillips flat-head screws	5	Remove grounding cover label
3	Rack-mount guide	6	Grounding plate

Figure 7: Rack-Mount Brackets (8K-2RU-KIT-S) on Cisco 8202-32FH-M Router—Port-Side Intake

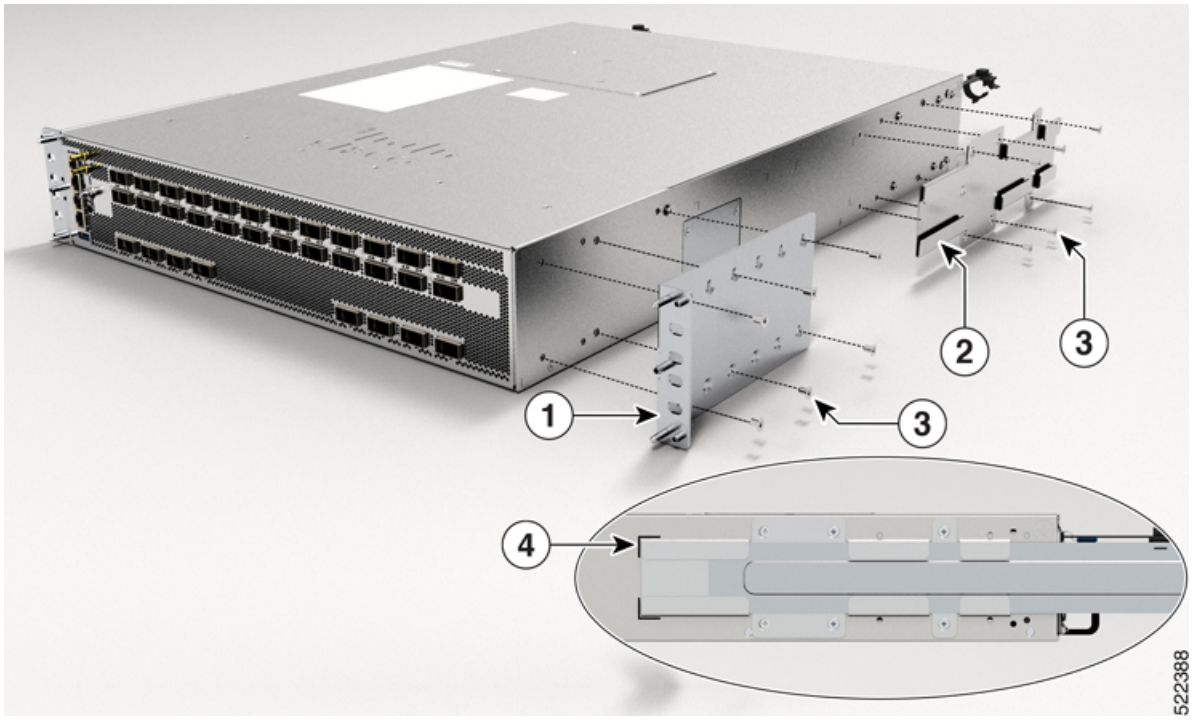
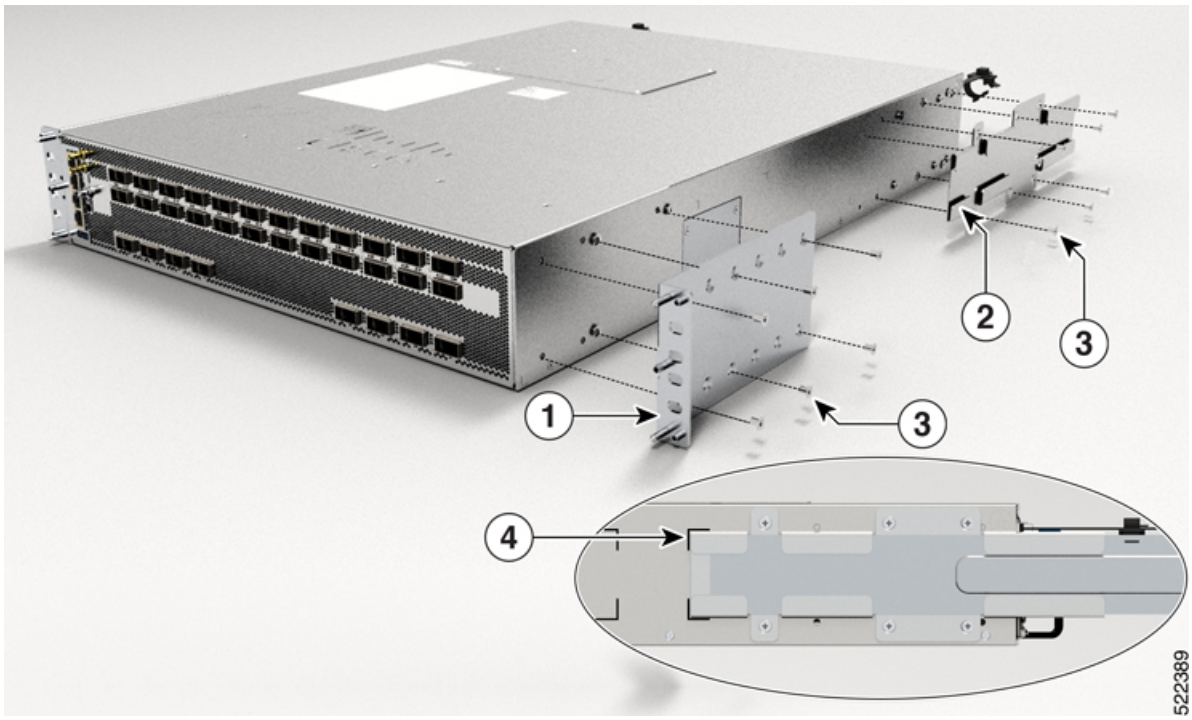


Figure 8: Rack-Mount Brackets (8K-2RU-KIT-L) on Cisco 8202-32FH-M Router—Port-Side Intake



1	Rack-mount brackets	3	M4 x 6mm Phillips flat-head screws

2	Rack-mount guide	4	Rack-mount guide rails. The orientation of the rail changes depending upon the rail that you select. The following rail types are available for Cisco 8202-32FH-M router: • 8K-2RU-KIT-S - Used for rack depth of 23" to 30" • 8K-2RU-KIT-L - Used for rack depth of 30" to 40"

Figure 9: Rack-Mount Brackets (8K-2RU-KIT-S) on Cisco 8212-48FH-M Router—Port-Side Intake

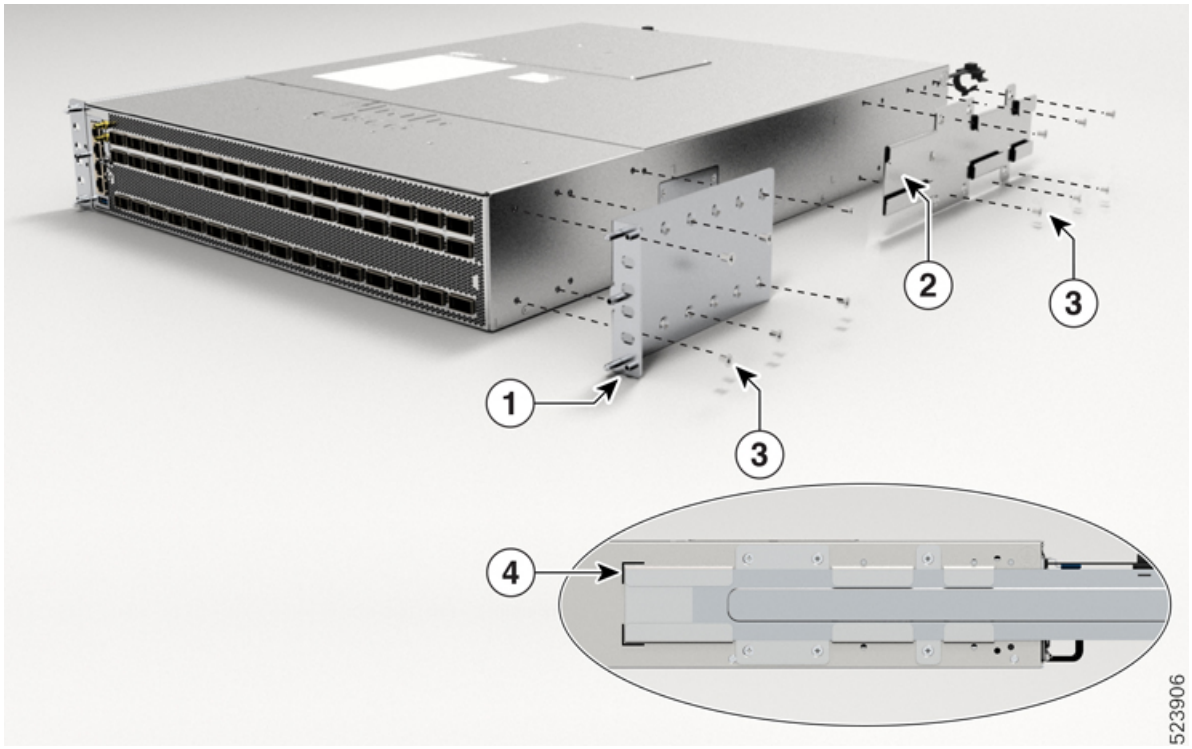
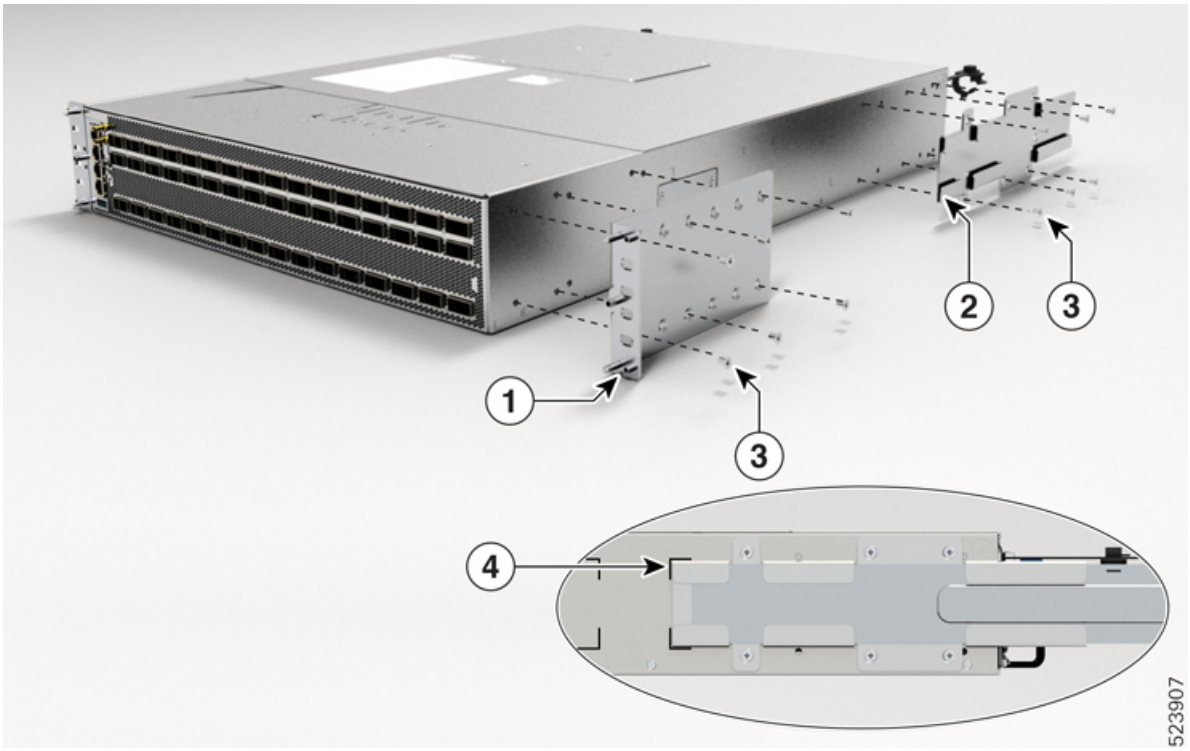


Figure 10: Rack-Mount Brackets (8K-2RU-KIT-L) on Cisco 8212-48FH-M Router—Port-Side Intake



1	Rack-mount brackets	3	M4 x 6mm Phillips flat-head screws
2	Rack-mount guide	4	Rack-mount guide rails. The orientation of the rail changes depending upon the rail that you select. The following rail types are available for Cisco 8212-48FH-M router: • 8K-2RU-KIT-S - Used for rack depths between 23 in. (584.2 mm) and 32 in. (812.8 mm) • 8K-2RU-KIT-L - Used for rack depths between 32 in. (812.8 mm) and 42 in. (1066.8 mm)

Figure 11: Rack-Mount Brackets on Cisco 8202 Router—Port-Side Intake

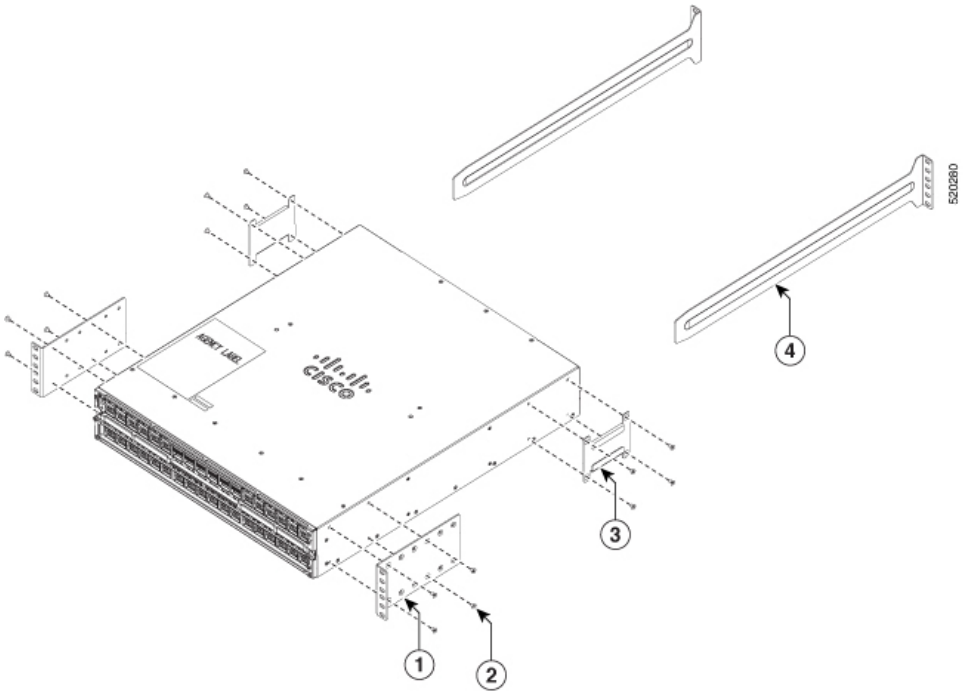
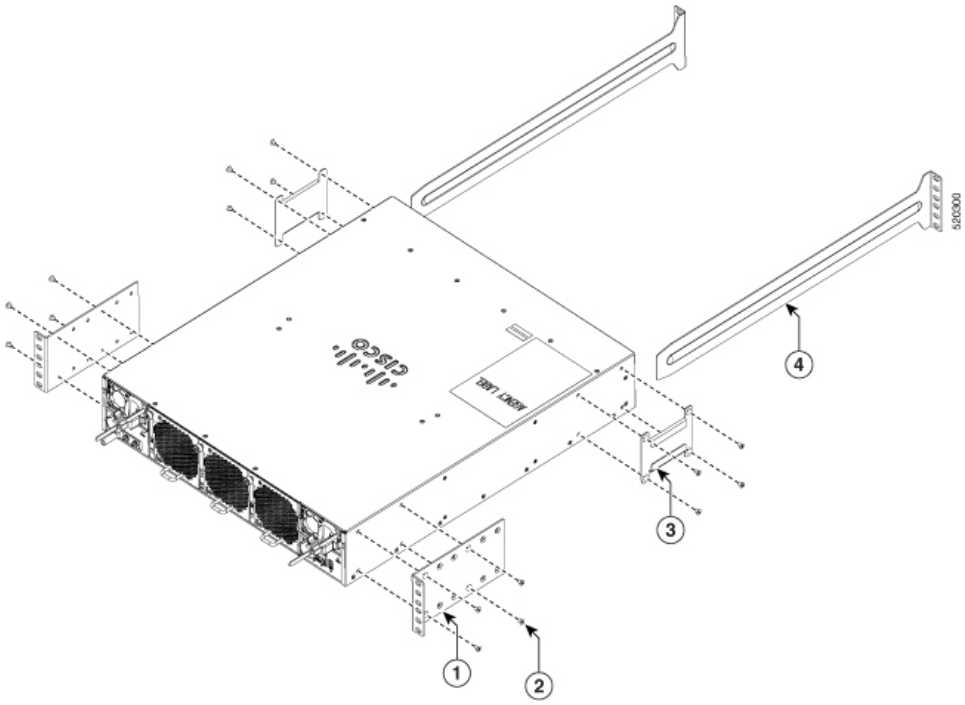


Figure 12: Rack-Mount Brackets on Cisco 8202 Router—Port-Side Exhaust



1	Rack-mount brackets	3	Rack-mount guide
2	M4 x 6mm Phillips flat-head screws	4	Rack-mount guide rails

Figure 13: Rack-Mount Brackets on Cisco 8201-32FH or Cisco 8201-24H8FH Router—Port-Side Intake

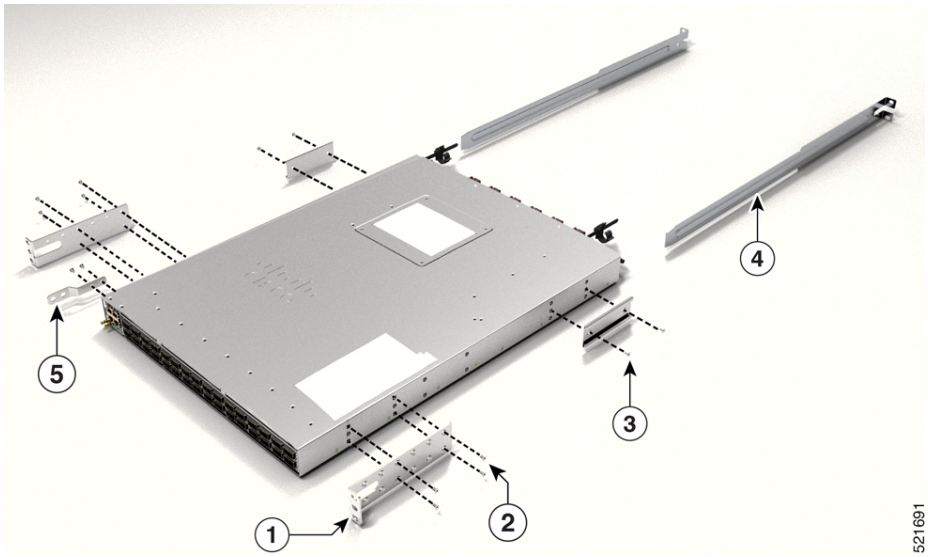
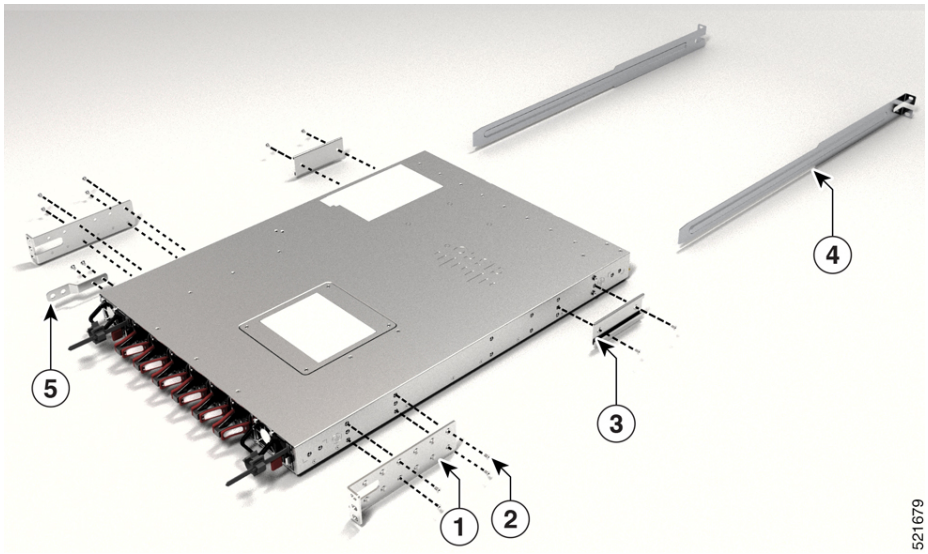


Figure 14: Rack-Mount Brackets on Cisco 8201-32FH or Cisco 8201-24H8FH Router—Port-Side Exhaust



1	Rack-mount brackets	4	Rack-mount guide rails
2	M4 x 6mm Phillips flat-head screws	5	Grounding plate
3	Rack-mount guide		

d) Repeat Step 1b with the other rack-mount bracket on the other side of the router.

Step 2 Install the two rack-mount guides on the chassis:

a) Position a rack-mount guides on the side of the chassis with its two holes aligned to the two screw holes on the side of the chassis, and use two M4 flat-head screws to attach the guides to the chassis. Tighten the screws to a torque of 13.25 in-lb (1.5 N-m).

b) Repeat with the other rack-mount guides on the other side of the router.

Step 3 Install the guide rails to the rack:

a) Position the guide rails at the desired levels on the back side of the rack and use four 12-24 screws or four 10-32 screws, depending on the rack thread type, to attach the rails to the rack.

Note
For racks with square holes, you may need to position a 12-24 or 10-32 cage nut behind each mounting hole in a guide rail before using a 12-24 or 10-32 screw.

b) Repeat with the other guide rail on the other side of the rack.

c) Use a tape measure and level to verify that the rails are at the same height and horizontal.

Step 4 Insert the router into the rack and attach:

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

b) Align the two rack-mount guides on either side of the router with the guide rails installed in the rack. Slide the rack-mount guides onto the guide rails, and then gently slide the router all the way into the rack.

Note
If the router does not slide easily, try realigning the rack-mount guides on the guide rails.

c) Holding the chassis level, insert two screws (12-24 or 10-32, depending on the rack type) through the holes in each of the rack-mount brackets and into the cage nuts or threaded holes in the rack-mounting rail.

d) Tighten the 10-32 screws to 20 in-lb (2.26 N.m) or tighten the 12-24 screws to 30 in-lb (3.39 N.m).

Rack-Mount the Chassis in a 2-Post Rack

This section describes how to install the Cisco 8201, Cisco 8202, Cisco 8201-32FH, Cisco 8202-32FH-M, Cisco 8212-48FH-M, or Cisco 8201-24H8FH router into a cabinet or 2-post 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 that is provided with the routers.

Table 6: Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
8	M4 x 0.7 x 6-mm Phillips flat-head screws

Procedure

Step 1 Install two rack-mount brackets to the router:

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

- If the router has port-side intake modules (fan modules and power modules with burgundy coloring), position the router so that its optical ports are in the cold aisle, and fans and power modules will be in the hot aisle.
- If the router has port-side exhaust modules (fan modules and power modules with blue coloring), position the router so that its fan and power supply modules are in the cold aisle and optical ports will be in the hot aisle.

b) (Only Cisco 8201, Cisco 8201-32FH, and Cisco 8201-24H8FH) Attach the grounding plate to the chassis. Use two M4 flat-head screws with 13.25 in-lbs (1.5 N-m) torque value to attach the grounding plate to the chassis.

Note
The Cisco 8201 chassis has a grounding cover label that must be removed before attaching the grounding plate to the chassis.

c) With the bracket ears facing toward the center of the chassis, position a front rack-mount bracket on the side of the chassis so that the four holes are aligned to four of the screw holes on the side of the chassis.
d) Use four M4 flat-head screws with 13.25 in-lbs (1.5 N-m) torque value to attach the bracket to the chassis.

Figure 15: Rack-Mount Brackets on Cisco 8201 Router—Port-Side Intake

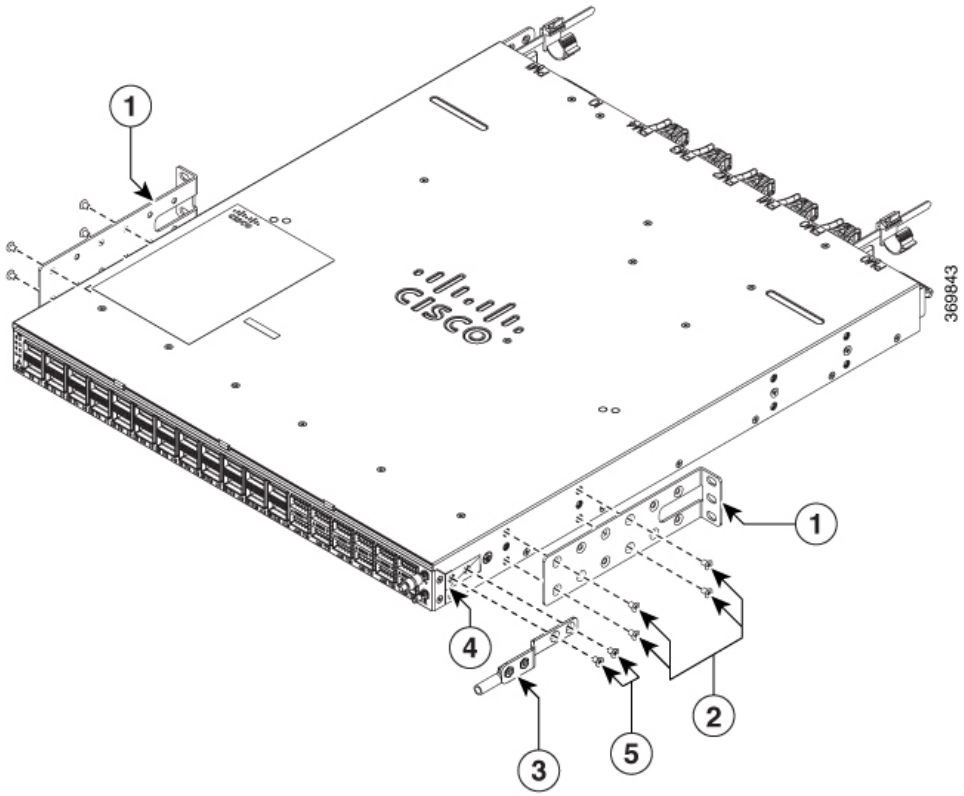
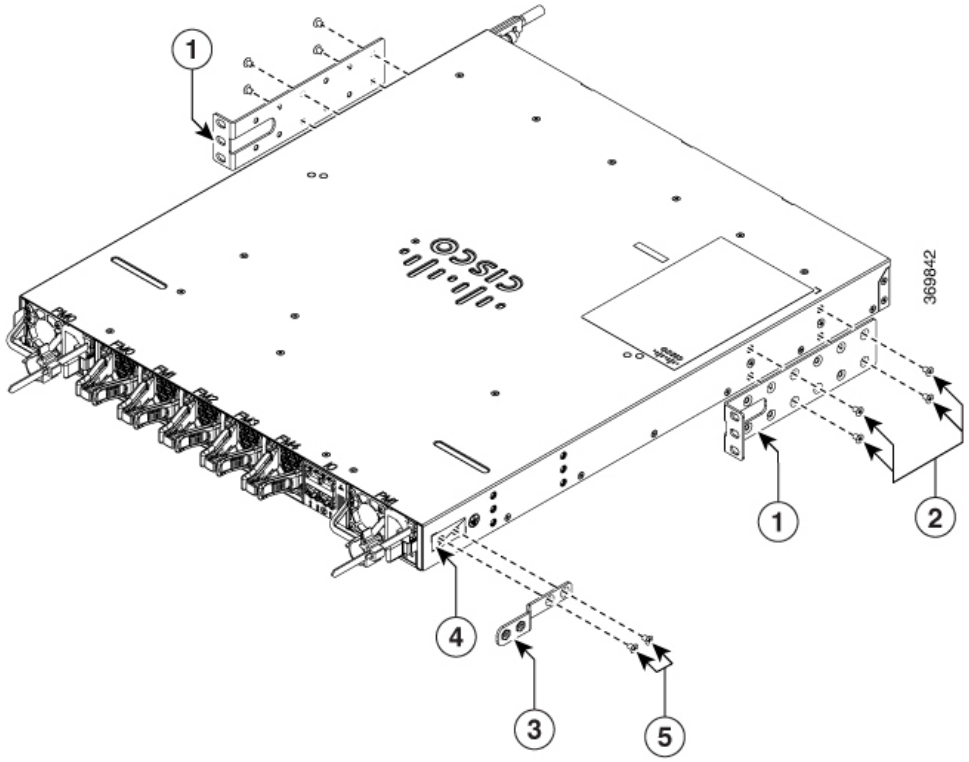


Figure 16: Figure 6: Rack-Mount Brackets on Cisco 8201 Router—Port-Side Exhaust



1	Rack-mount brackets	4	Ground plate mount location
2	M4 x 6-mm Phillips flat-head screws	5	M4 x 6-mm Phillips flat-head screws
3	Grounding plate		

Figure 17: Rack-Mount Brackets on Cisco 8202 Router—Port-Side Intake

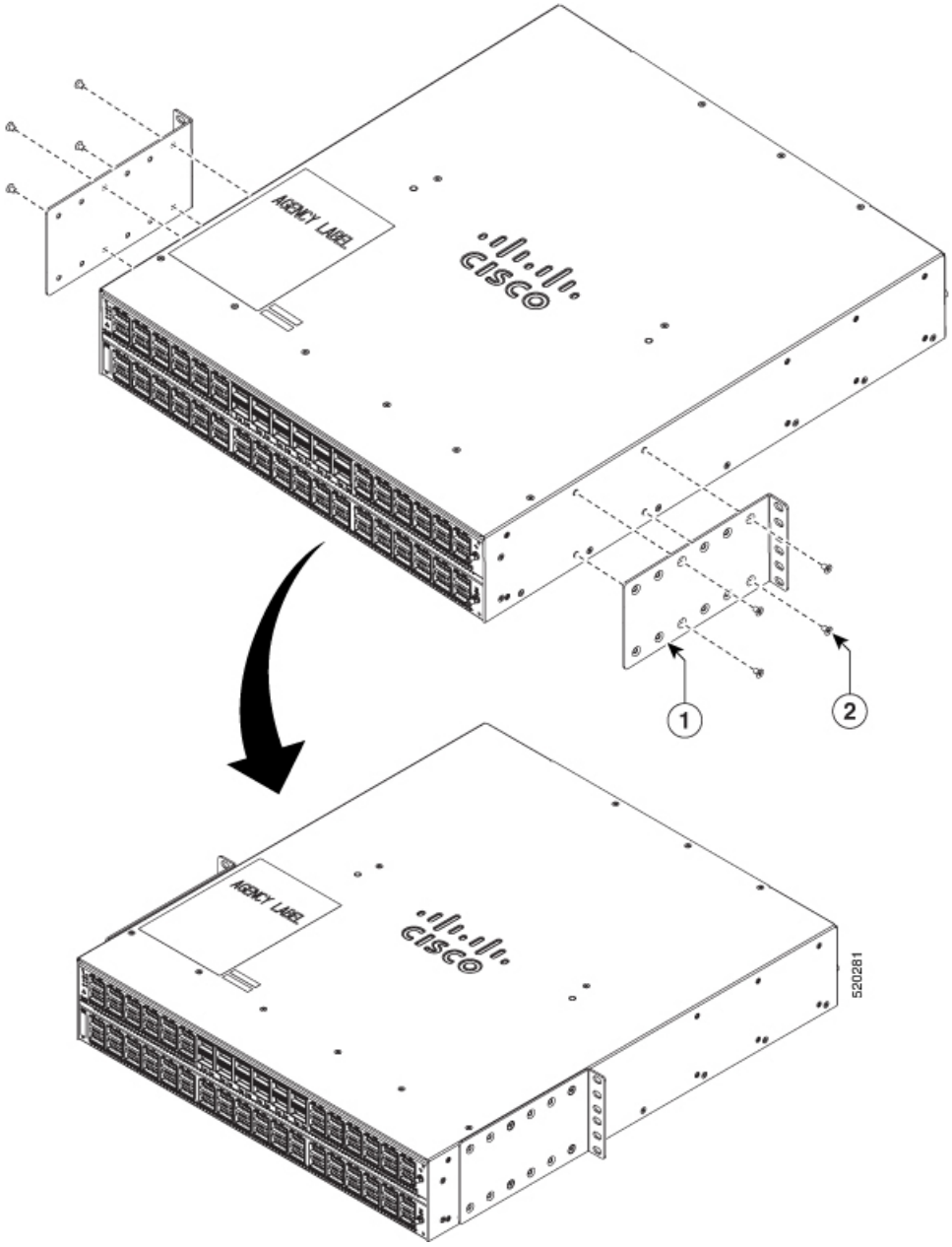
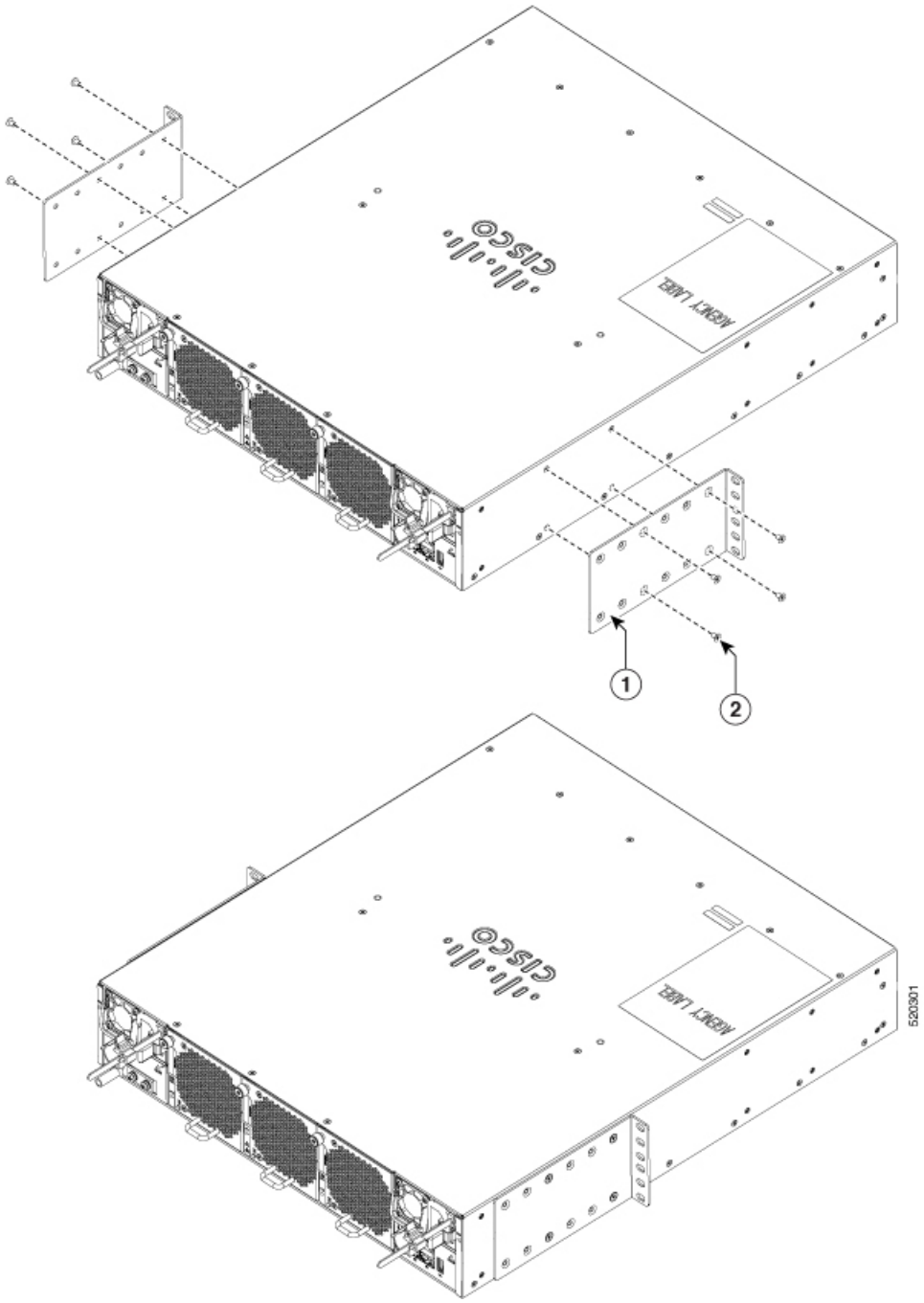


Figure 18: Rack-Mount Brackets on Cisco 8202 Router—Port-Side Exhaust



1	Rack-mount brackets	2	M4 x 6-mm Phillips flat-head screws

Figure 19: Rack-Mount Brackets on Cisco 8201-32FH or Cisco 8201-24H8FH Router—Port-Side Intake

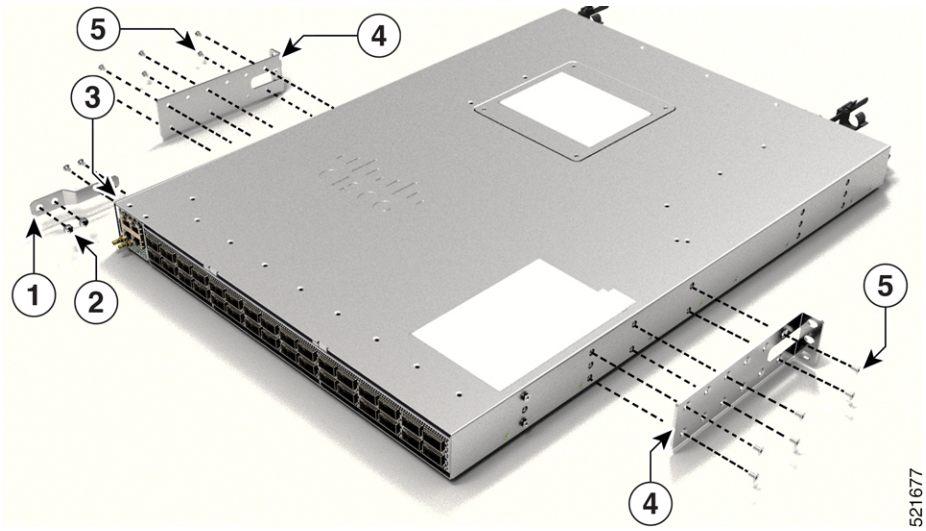
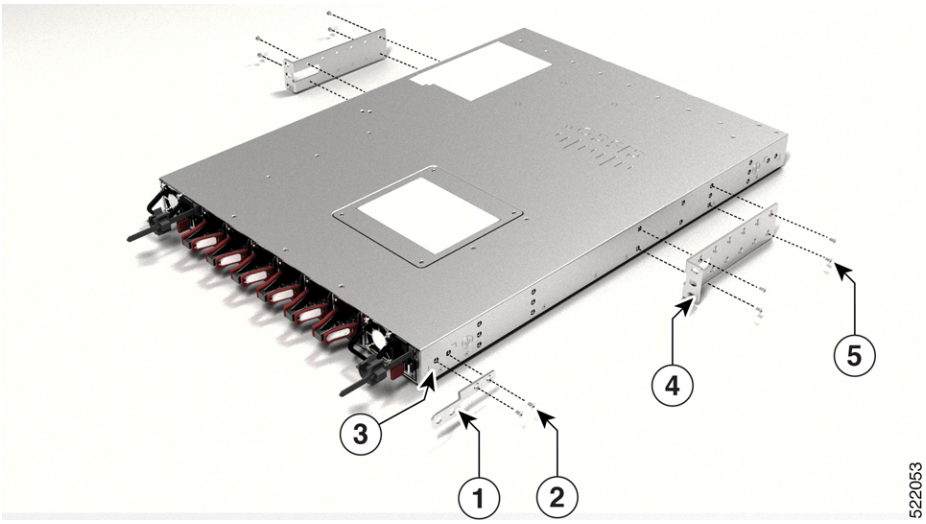
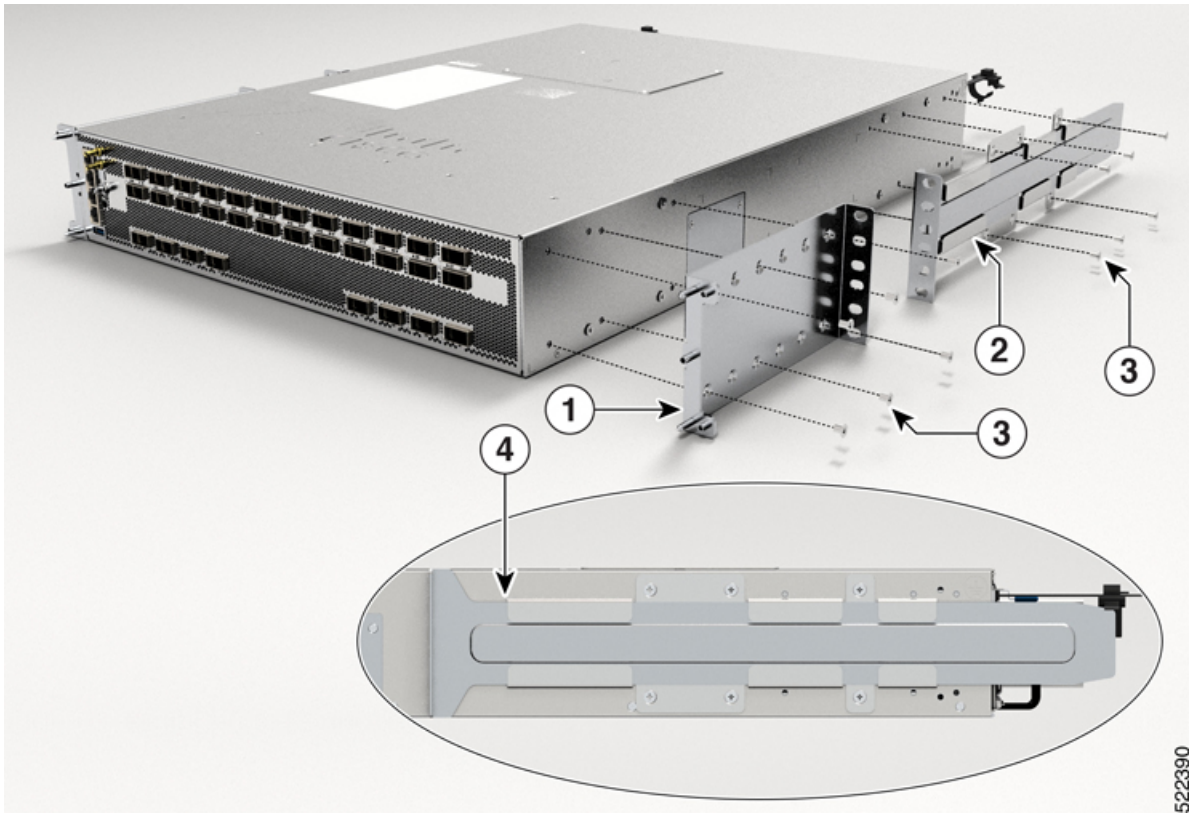


Figure 20: Rack-Mount Brackets on Cisco 8201-32FH or Cisco 8201-24H8FH Router—Port-Side Exhaust



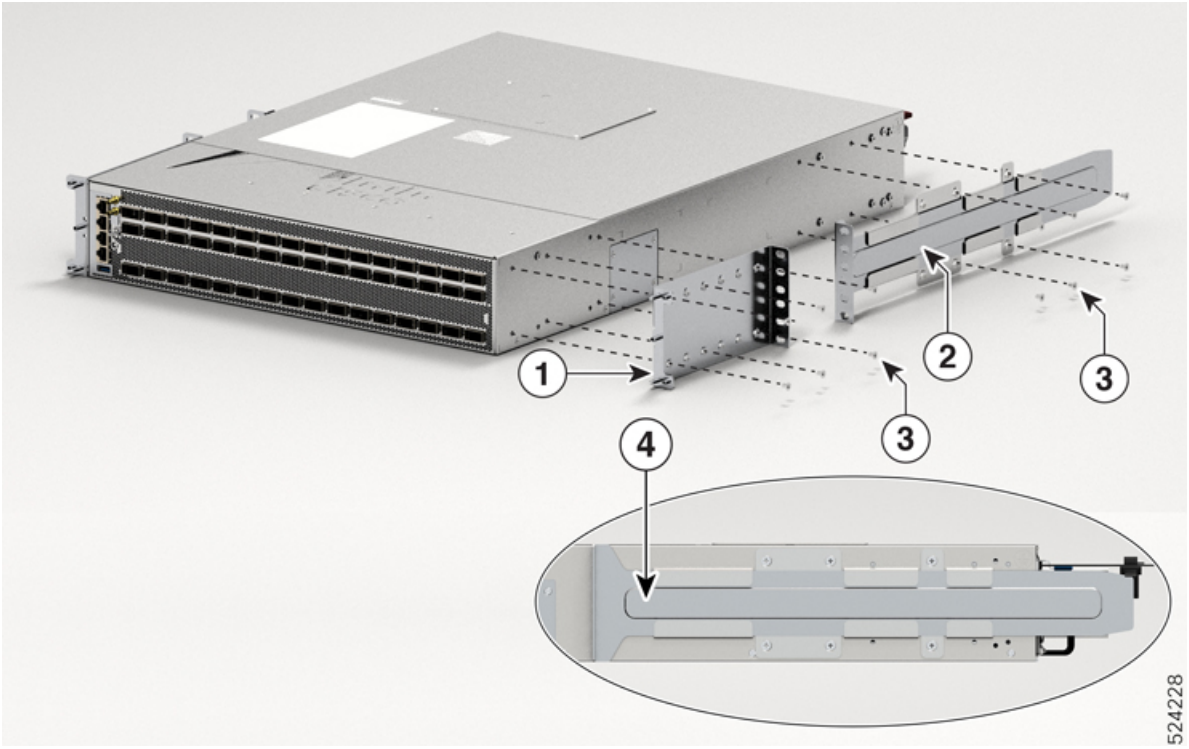
1	Grounding plate	2	M4 x 6-mm Phillips flat-head screws
3	Ground plate mount location	4	Rack-mount brackets
5	M4 x 6-mm Phillips flat-head screws		

Figure 21: Rack-Mount Brackets on Cisco 8202-32FH-M Router—Port-Side Intake



1	Rack-mount bracket	3	M4 x 6-mm Phillips flat-head screws
2	Slider fixed in rack-mount bracket	4	Rail slider

Figure 22: Rack-Mount Brackets on Cisco 8212-48FH-M Router—Port-Side Intake



1	Rack-mount bracket	3	M4 x 6-mm Phillips flat-head screws
2	Slider fixed in rack-mount bracket	4	Rail slider

e) Repeat Steps 1b and 1c with the other rack-mount bracket on the other side of the router.

Step 2 Install the router onto the 2-post rack:

a) With the assistance of another person, lift the router into position between the two rack posts.
b) Move the router until the rack-mount brackets come in contact with two rack posts.
c) Hold the chassis at a level position while the second person inserts two screws (12-24 or 10-32, depending on the rack type) in each of the two rack-mount brackets (a total of four screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails.

For Cisco 8202-32FH-M and Cisco 8212-48FH-M chassis:

1. Hold the chassis at a level position while the second person inserts three screws (12-24 or 10-32, depending on the rack type) in each of the two front rack-mount brackets (a total of six screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails.
2. Attach the rear rack mount bracket and rail slider on both sides of the chassis (marked as 2 in the *Rack-Mount Brackets on Cisco 8202-32FH-M Router—Port-Side Intake* and *Rack-Mount Brackets on Cisco 8212-48FH-M Router—Port-Side Intake* images). You must first slide the rail into rear rack mount and then fix them in the assembled condition to the chassis.
3. Insert the two screws (12-24 or 10-32, depending on the rack type) in each of the two rear rack-mount brackets (a total of four screws) and into the cage nuts or threaded holes in the vertical rack mounting rails.

Figure 23: Cisco 8202-32FH-M Router

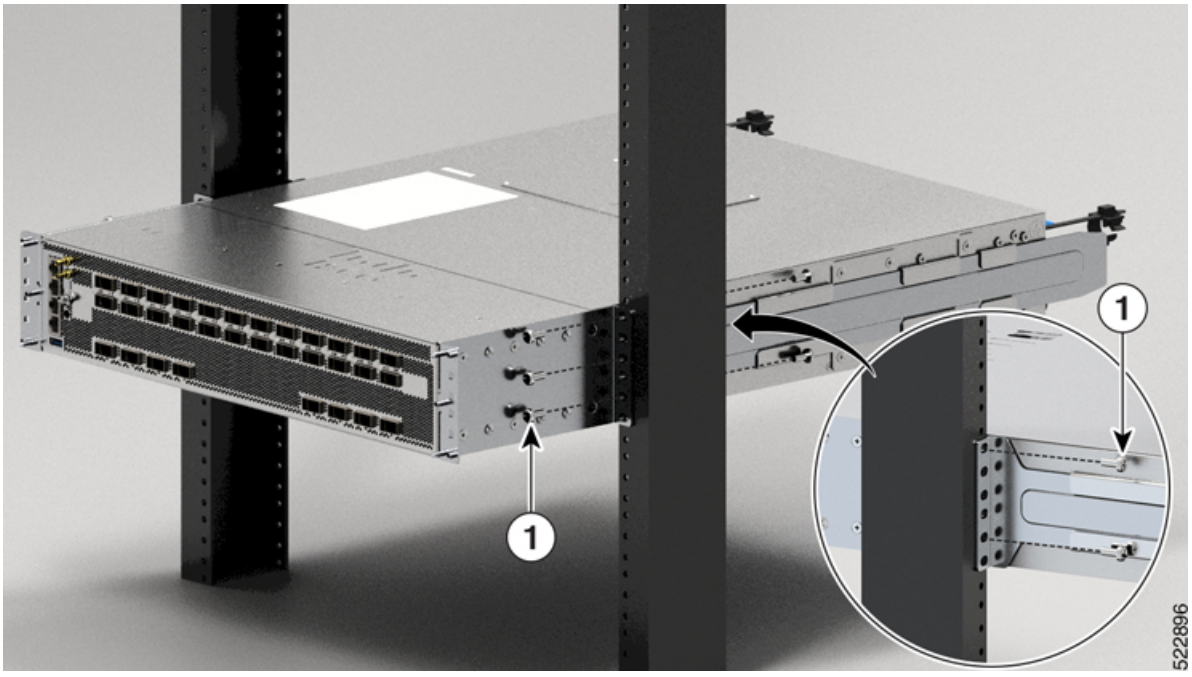
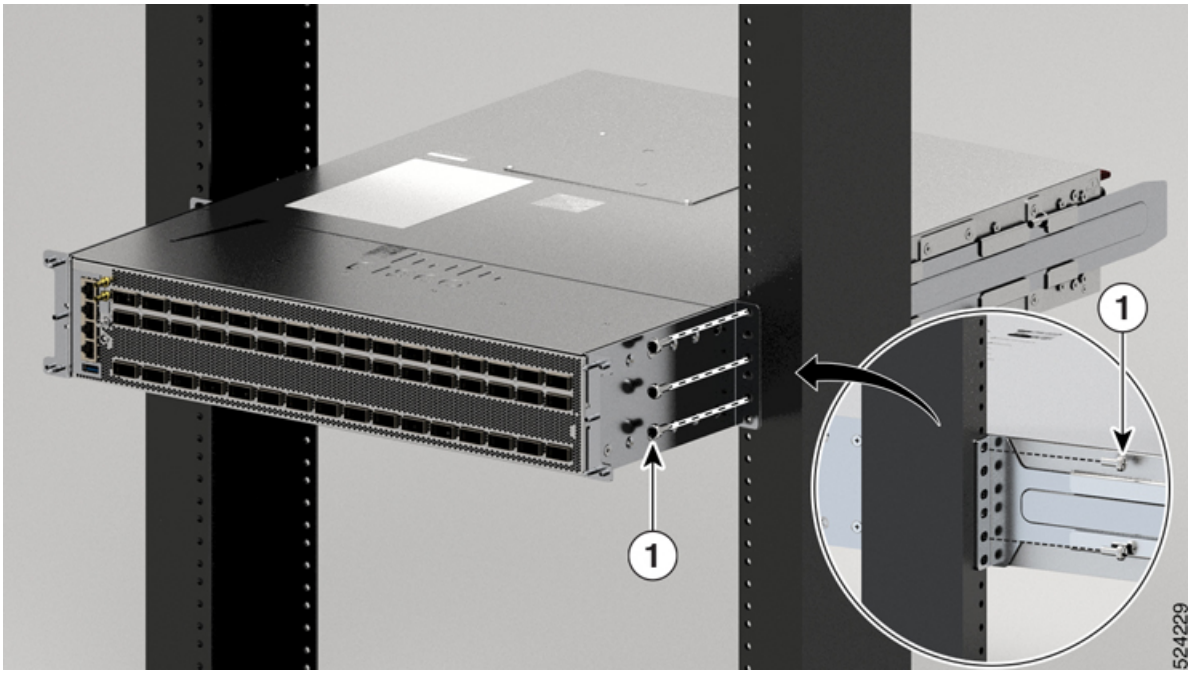


Figure 24: Cisco 8212-48FH-M Router



1	M4 x 6-mm Phillips flat-head screws

d) Tighten the 10-32 screws to 20 in-lb (2.26 N.m) or tighten the 12-24 screws to 30 in-lb (3.39 N.m).

Installing a Cable Management Bracket

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

Note

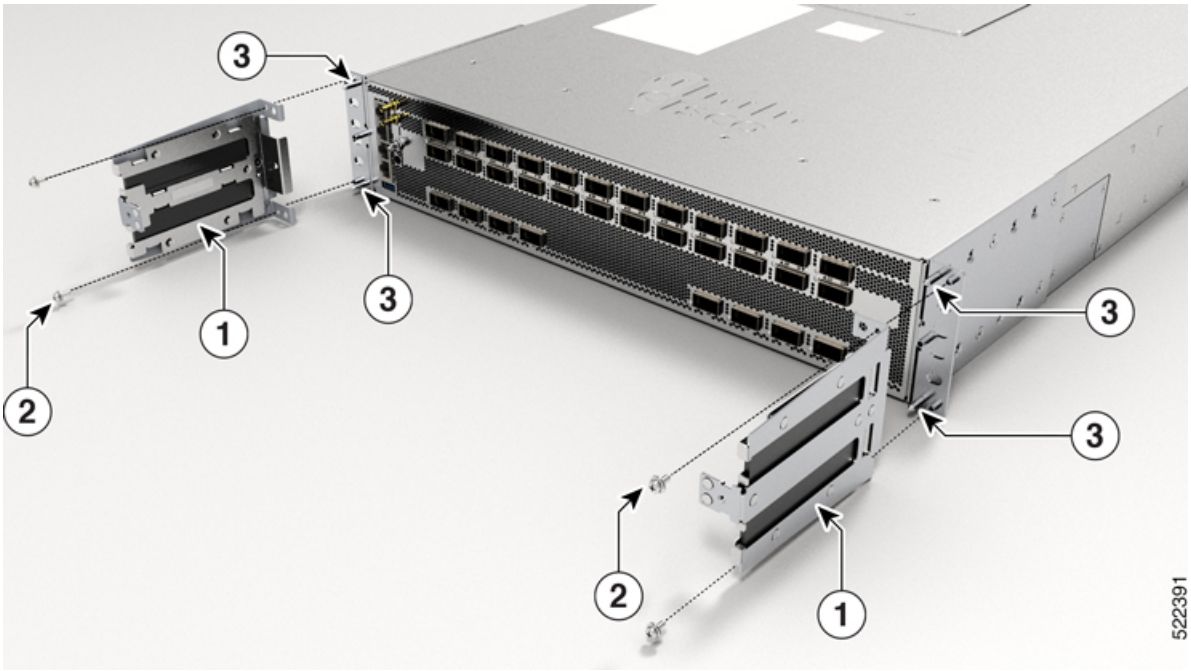
- This procedure is applicable for Cisco 8202-32FH-M and 8212-48FH-M chassis.
- The cable management brackets for Cisco 8202-32FH-M and 8212-48FH-M chassis supports only optics cables.

Procedure

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

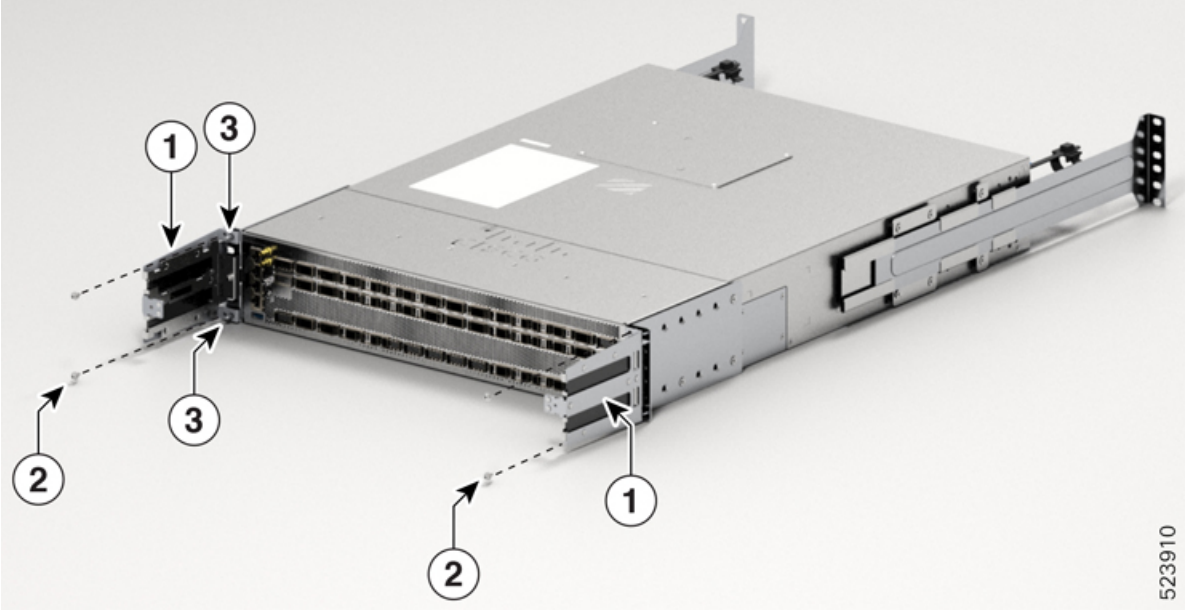
Step 2 Align the cable-management bracket with the two alignment pins on the rack-mount bracket.

Figure 25: Cable-Management Bracket Installation and Removal on Cisco 8202-32FH-M Router



1	Cable-Management Bracket	2	Securing Screws - M3 x 8mm pan-head screws
3	Alignment Pins		

Figure 26: Cable-Management Bracket Installation and Removal on Cisco 8212-48FH-M Router



1	Cable-Management Bracket	2	Securing Screws - M3 x 8mm pan-head screws
3	Alignment Pins		

Step 3 Secure the cable management bracket with the screws provided in the cable management kit.

Step 4 Connect all the cables to the intended ports and pass them through the cable management bracket in an organized manner.

Install the Air Filter

The Cisco 8200 series routers offer the following optional air filters:

Router	Filter Kit (port-side intake)	Filter Kit (port-side exhaust)
Cisco 8202	8202-FILTER-PI	FILTER-2RU-PE
Cisco 8202-32FH-M	8K-2RU-FILTER	NA
Cisco 8212-48FH-M	8K-2RU-FILTER	NA

Note We recommend that you inspect the air filter every three months and replace, if necessary, every six months. Air filters are consumable items and must be ordered separately by customers. Customers may contact TAC for assistance in identifying the correct air filter PID to order. We recommend having spare air filters in stock.

Note To install an air filter on a Cisco 8202-32FH-M or Cisco 8212-48FH-M chassis, you must first install a cable management bracket. For information on cable management bracket, see here.

Install the Air Filter on the Port Side Inlet

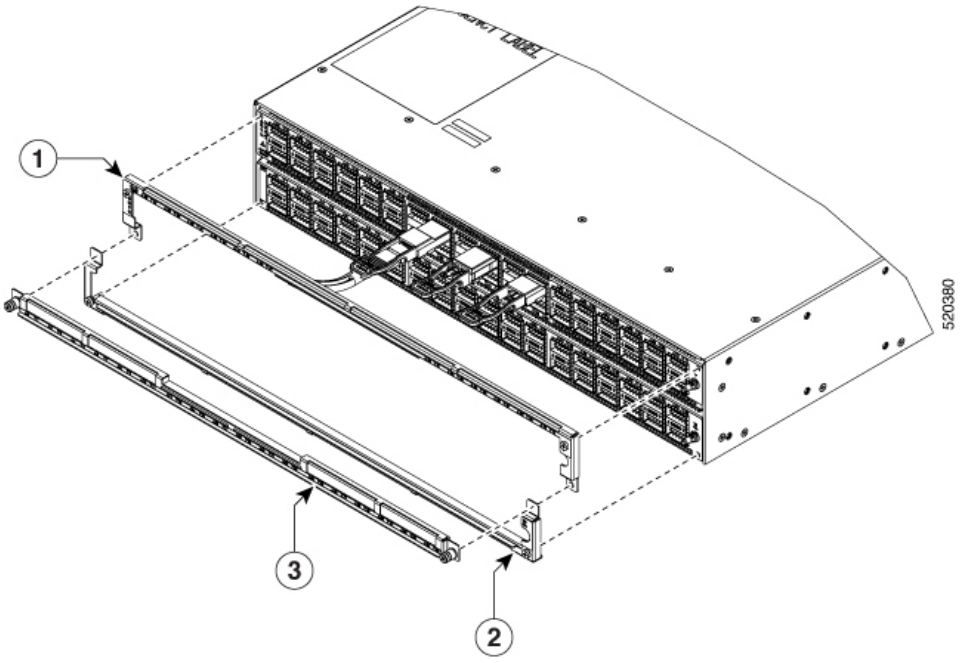
If the air filter on the port-side inlet needs replacement, follow this procedure.

Note To fix the top and bottom filters use a manual screwdriver to gently turn the screws. Ensure that you turn the screws only three to four times, and that you do not overtighten the screws. Use 0.65 in-lbs (5.9 N-m) torque value to tighten the screws.

Procedure

Step 1 Place the top air filter section on the top port-side of the chassis and secure it with the two screws at the upper left and right.

Figure 27: Port-side Inlet Air Filter



1	Top Air Filter Section	3	Air Filter
2	Bottom Air Filter Section		

Step 2 Place the bottom air filter section along the bottom port-side of the chassis and secure it with the two screws at the lower left and right.

Step 3 Insert the air filter between the top and bottom air filter sections and tighten the six screws (two on each side, and two in the middle).

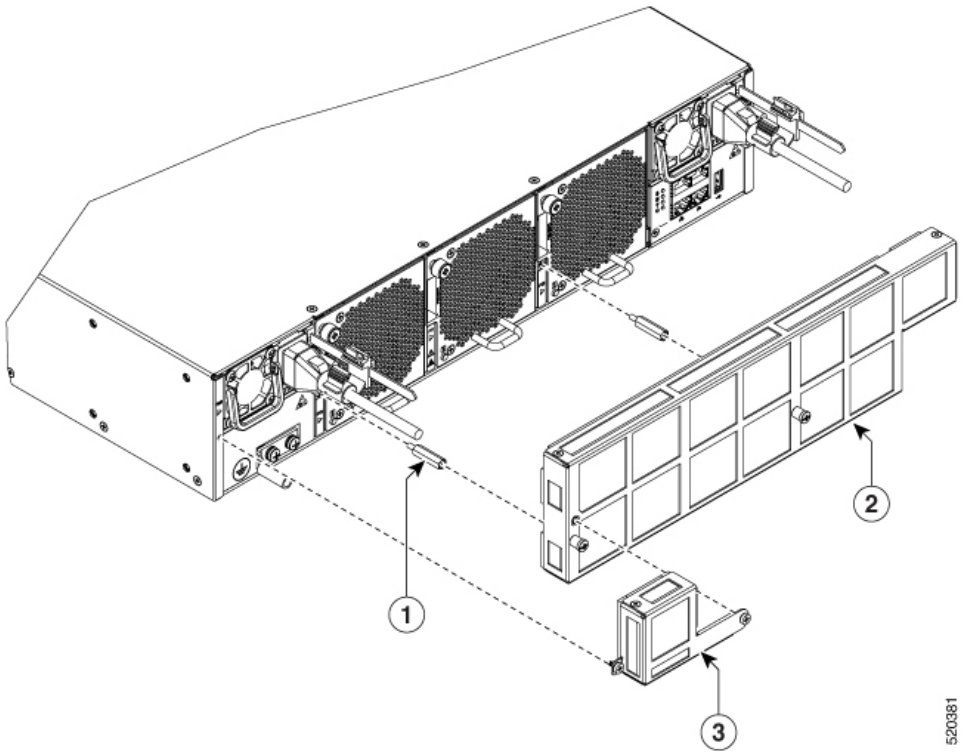
Install the Air Filter on the Port Side Exhaust

If the air filter on the port-side exhaust needs replacement, follow this procedure.

Procedure

Step 1 Install the two standoffs to the chassis.

Figure 28: Port Side Exhaust Air Filter



1	Standoffs	3	Side Filter Extension
2	Main Air Filter		

Step 2 Install the main air filter by aligning it to the standoffs and tightening the two thumb screws.

Step 3 Install the side filter extension and tighten the 2 screws (1 to the chassis and 1 to the main air filter).

Install the Air Filter on the Port Side Inlet for Cisco 8202-32FH-M and Cisco 8212-48FH-M Chassis

If the air filter on the port-side inlet needs replacement, follow this procedure.

Note Ensure that you do not overtighten the screws. Use 0.65 in-lbs (5.9 N-m) torque value to tighten the screws.

Procedure

Step 1 Place the air filter as shown in the below figure. Ensure that the filter is aligned with the pins on the cable management bracket.

Figure 29: Port-side Inlet Air Filter on Cisco 8202-32FH-M Chassis

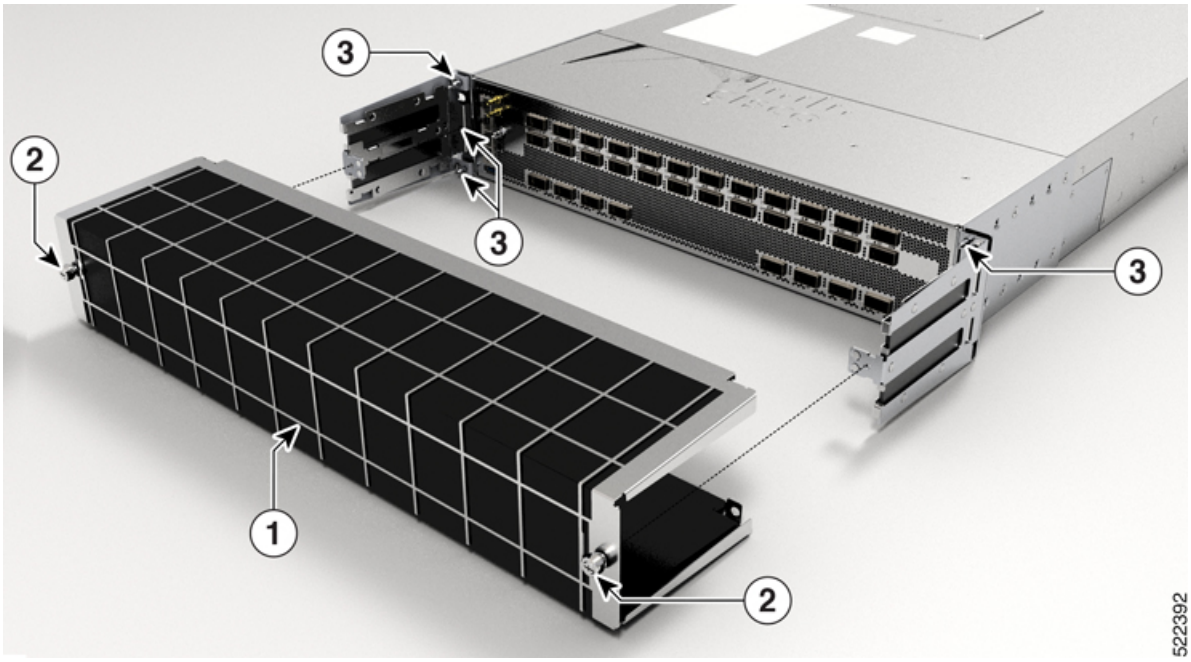
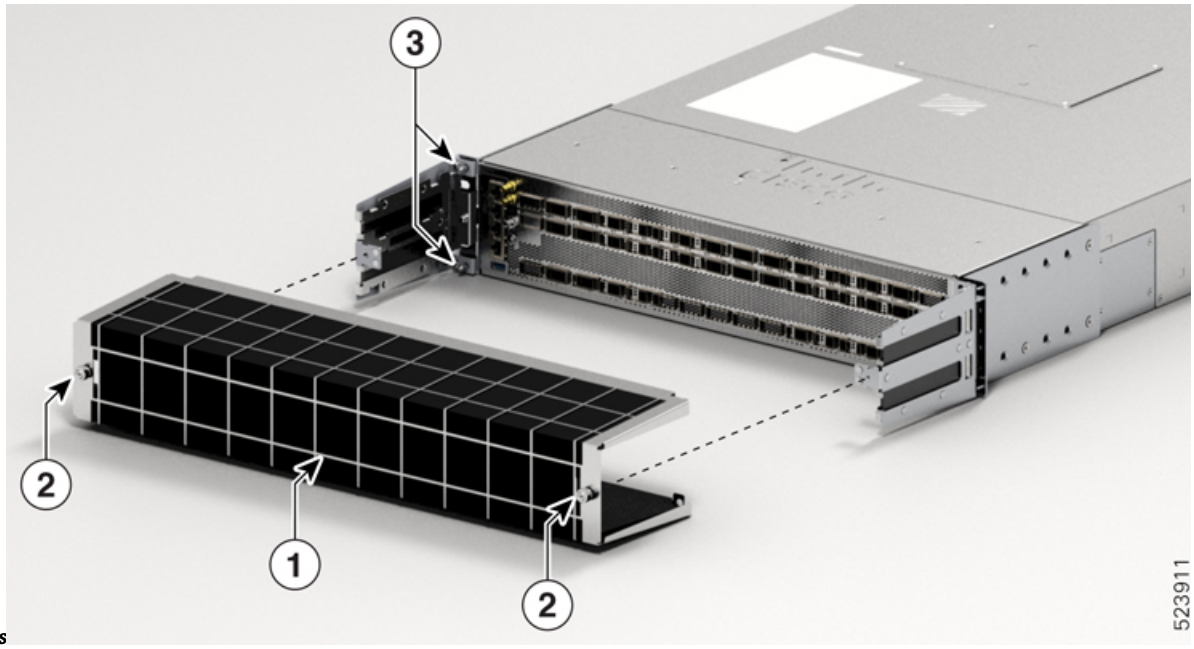


Figure 30: Port-side Inlet Air Filter on Cisco 8212-48FH-M



Chassis

1	Air Filter	2	Securing screws
3	Alignment pins		

Step 2 Tighten the two screws to secure the air filter.

Ground the Chassis

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.

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 (#6 AWG 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 (Only Cisco 8202-32FH-M and Cisco 8212-48FH-M) Attach the grounding plate (L-bracket) to the rear of the chassis.
.

Step 5 Attach the ground cable:

- Position the grounding lug against the grounding plate or the grounding point on the chassis to ensure solid metal-to-metal contact. Insert the provided screws through the holes in the grounding lug and into the grounding plate or grounding point.

Figure 31: Cisco 8201 Router Ground Lug

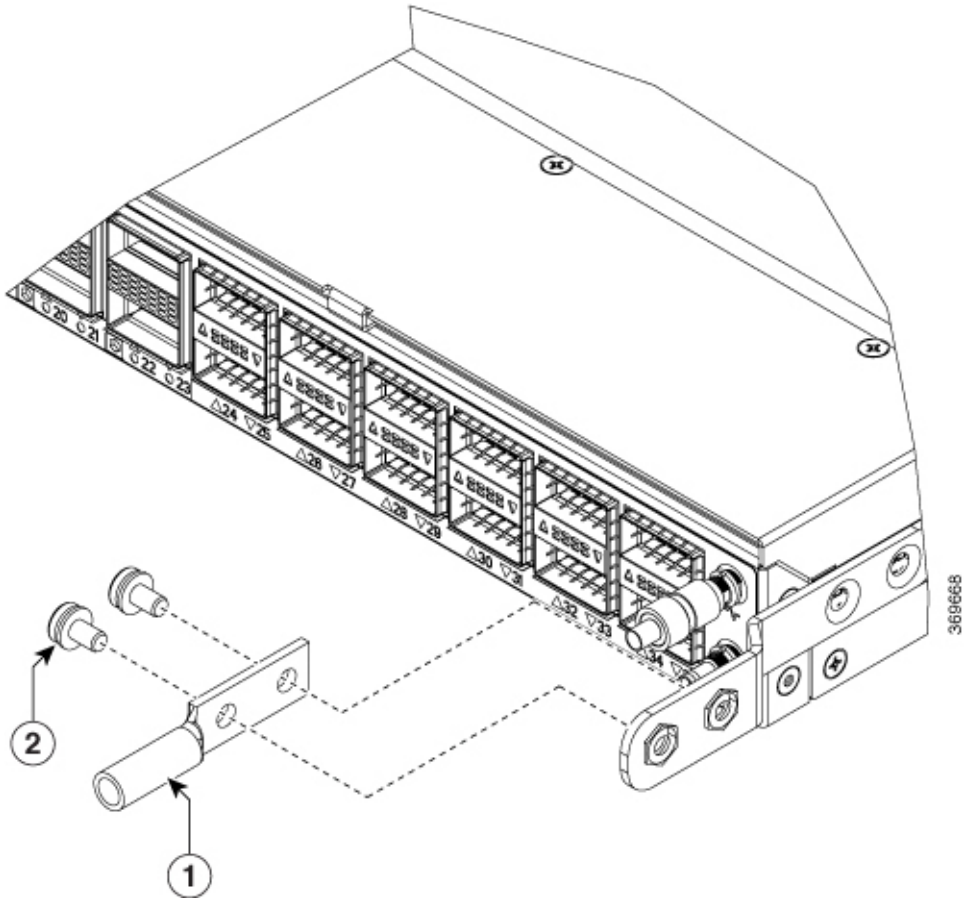


Figure 32: Cisco 8202 Router Ground Lug

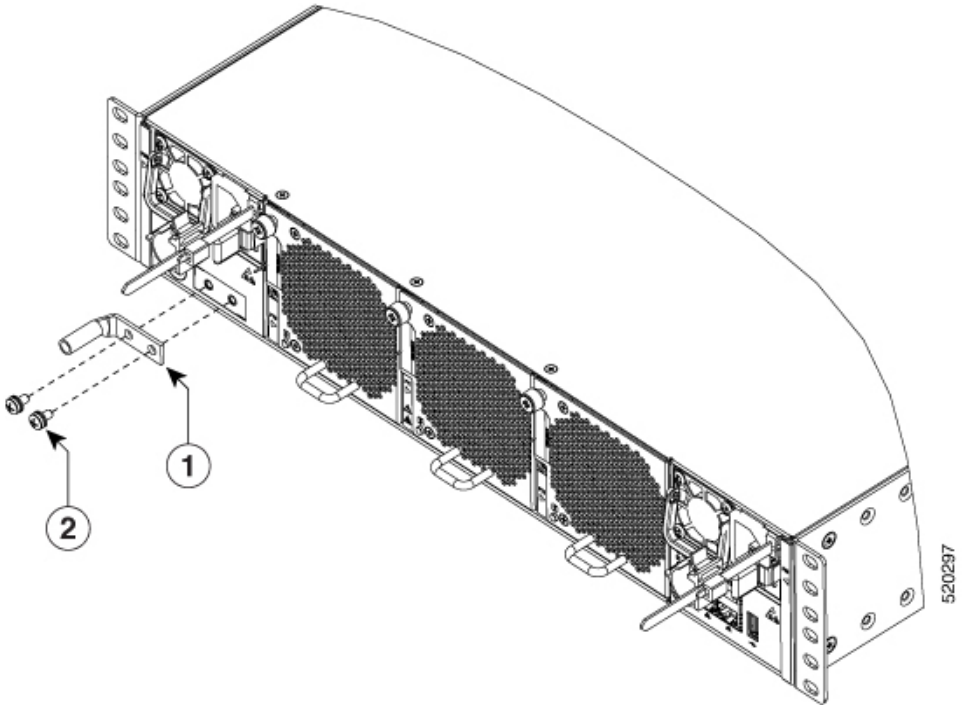
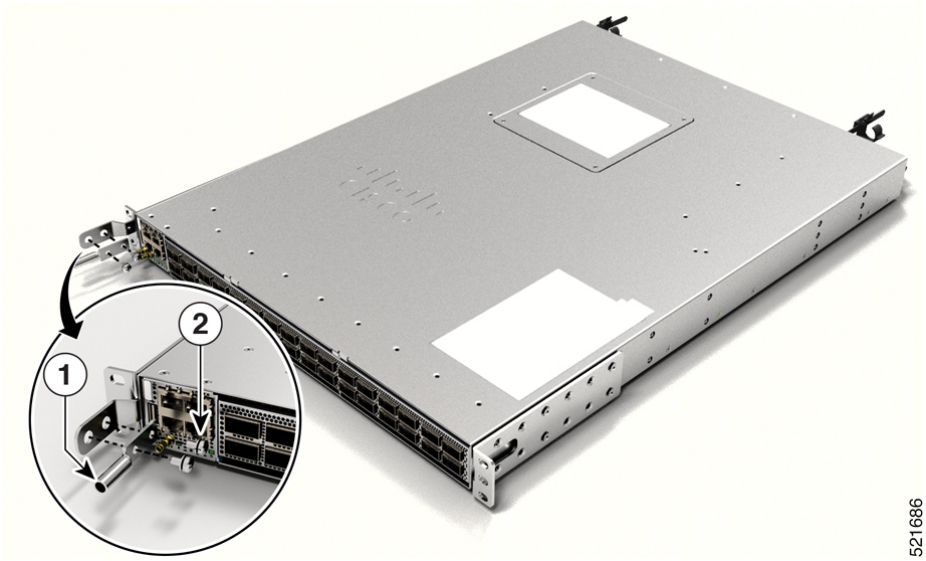
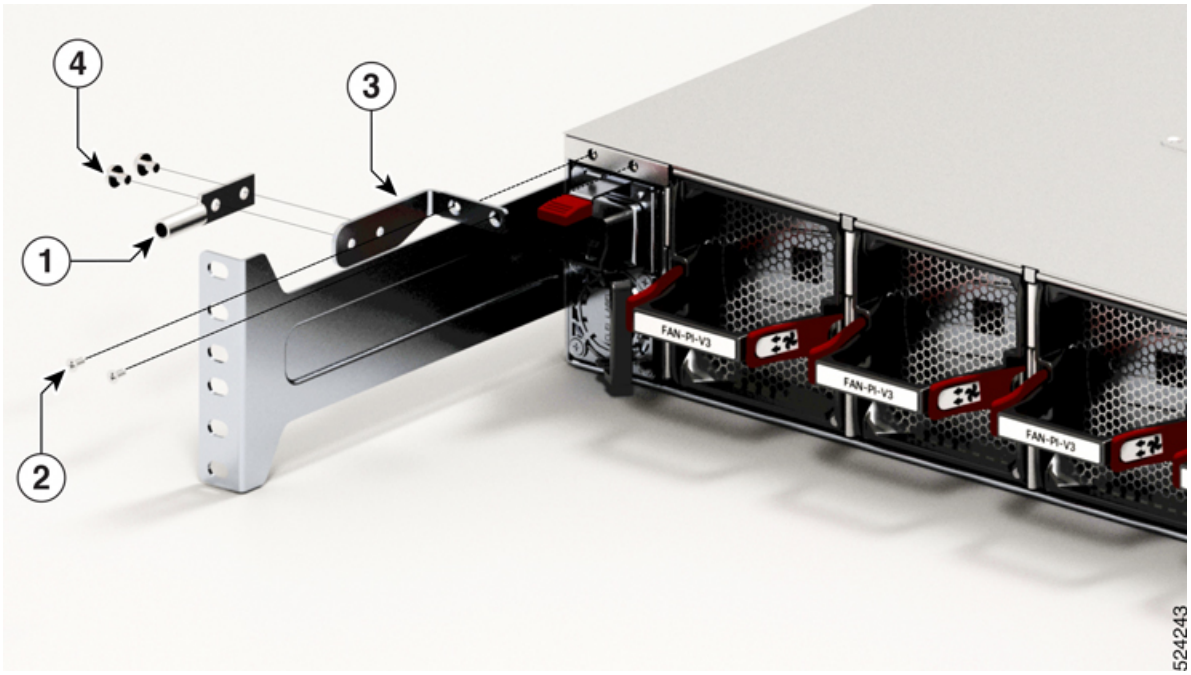


Figure 33: Cisco 8201-32FH or Cisco 8201-24H8FH Ground Lug



1	Grounding lug	2	M4 x 6mm pan-head screws

Figure 34: Cisco 8202-32FH-M or Cisco 8212-48FH-M Ground Lug



1	Grounding lug	2	• M4 x 6mm flat-head screws for Cisco 8202-32FH-M • M3 x 6mm flat-head screws for Cisco 8212-48FH-M
3	• L Bracket (700-128326-01 part number for Cisco 8202-32FH-M) • L Bracket (700-133064-01 part number for Cisco 8212-48FH-M)	4	M4 x 6mm pan-head screws

Step 6 Tighten the pan-head screws to torque value of 13.25 in-lbs (1.5 N-m).

Step 7 Ensure that the lug and cable do not interfere with other equipment.

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.

Power Supply Unit Input and Output Ranges

Power Supply Restrictions and Considerations

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.

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

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

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.

This table summarizes the list of power supplies' input and output power ranges for different input applications:

Table 7: Input and Output Power Ranges at Low Line, High Line, Low Voltage, and High Voltage Applications

Power Supply Unit PIDs	Supported Routers	Input Voltage	Input Current (Max)	Output Power
PSU1.4KW-ACPI PSU1.4KW-ACPE For low line applications	Cisco 8201 Cisco 8202 Cisco 8201-32FH Cisco 8201-24H8FH	100V -127V AC	12A	1000W
PSU1.4KW-ACPI PSU1.4KW-ACPE For high line applications	Cisco 8201 Cisco 8202 Cisco 8201-32FH Cisco 8201-24H8FH	200V - 240V AC	9 A	1450W

Power Supply Unit PIDs	Supported Routers	Input Voltage	Input Current (Max)	Output Power
PSU2KW-ACPI PSU2KW-ACPE For low line applications	Cisco 8201 Cisco 8202 Cisco 8201-32FH Cisco 8201-24H8FH Note: Cisco 8202-32FH-M supports only PSU2KW-ACPI	100V - 127V AC	12A	1000W
PSU2KW-ACPI PSU2KW-ACPE For high line applications	Cisco 8201 Cisco 8202 Cisco 8201-32FH Cisco 8201-24H8FH Note: Cisco 8202-32FH-M supports only PSU2KW-ACPI	200V AC - 240V AC	12 A	2000W
PSU2KW-DCPI PSU2KW-DCPE Low Input DC voltage applications	Cisco 8201 Cisco 8202 Cisco 8201-32FH Cisco 8201-24H8FH Note: Cisco 8202-32FH-M supports only PSU2KW-DCPI	-40V DC to -72V DC	55A	2000W
PSU2KW-HVPI For AC high line applications	Cisco 8201 Cisco 8202 Cisco 8201-32FH Cisco 8201-24H8FH Cisco 8202-32FH-M	200V AC - 277 V AC	12A	2000W
PSU2KW-HVPI For AC low line applications	Cisco 8201 Cisco 8202 Cisco 8201-32FH Cisco 8201-24H8FH Cisco 8202-32FH-M	100V AC - 127V AC	12A	1000W

Power Supply Unit PIDs	Supported Routers	Input Voltage	Input Current (Max)	Output Power
PSU2KW-HVPI For HVDC applications	Cisco 8201 Cisco 8202 Cisco 8201-32FH Cisco 8201-24H8FH Cisco 8202-32FH-M	240V DC - 380V DC	12A	2000W
PSU3KW-HVPI For AC high line applications	Cisco 8202-32FH-M Cisco 8212-48FH-M	200V AC - 277V AC	16A	3000W
PSU3KW-HVPI For AC low line applications	Cisco 8202-32FH-M Cisco 8212-48FH-M	100V AC - 127V AC	16A	1500W
PSU3KW-HVPI For HVDC applications	Cisco 8202-32FH-M Cisco 8212-48FH-M	240V DC - 380V DC	14A	3000W
PSU3KW-DCPI	Cisco 8212-48FH-M Cisco 8202-32FH-M	- 48V DC to - 60V DC	35A	3000W
PSU3KW-DCPI-ORV3	Cisco 8212-48FH-M	45V DC to 54.5V DC	85A	3100W (at 41V)

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.

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.

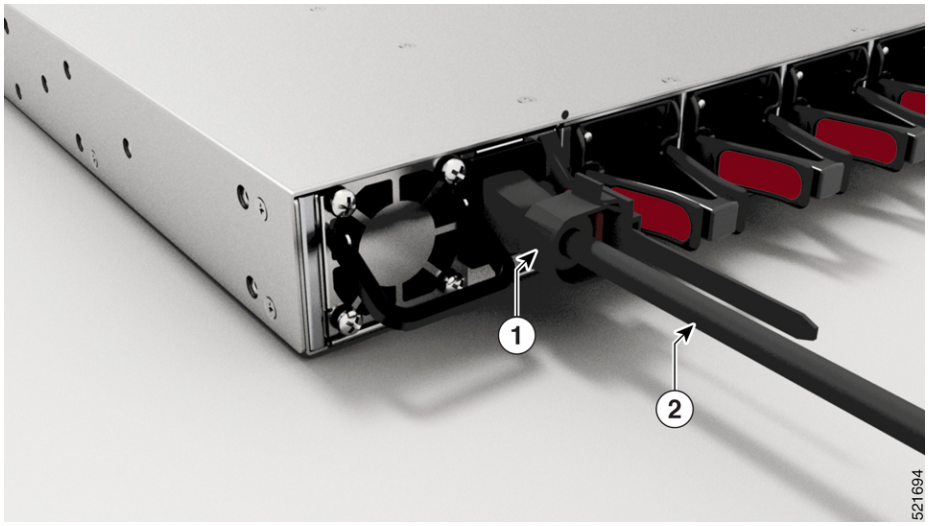
Step 2 Attach the AC power cable to the cable connector in the AC power module.

Step 3 Place the cable through the opening in the power cord retention clamp.

Step 4 Slide the power cord retention clamp towards the plug.

Step 5 Close the power cord retention clamp on the shoulder of the power cable to secure the power cable.

Figure 35: Connecting AC Power



1	Power cord retention clamp	2	AC power cable

AC-Input Power Cord Options

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

Table 8: AC-Input Power Cord Options for Cisco 8200 Series Router

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

Locale	Part Number	Length	Power Cord Rating
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
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

Figure 36: CAB-AC-10A-NA

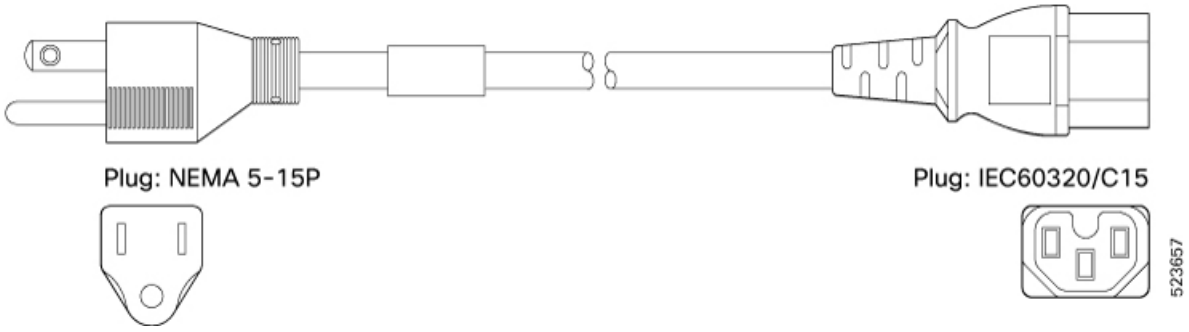


Table 9: High-Voltage Input Power Cord Options for Cisco 8200 Series Router

Locale	Part Number	Length	Power Cord Rating
Argentina	CAB-AC-16A-SG-AR	14 ft (4.26 m)	16A, 250 VAC
Australia	CAB-AC-16A-SG-AZ	14 ft (4.26 m)	16A, 250 VAC
Brazil	CAB-AC-16A-SG-BR	14 ft (4.26 m)	16A, 250 VAC

Locale	Part Number	Length	Power Cord Rating
China	CAB-AC-16A-SG-CH CAB-AC-16A-CN	14 ft (4.26 m)	16A, 250 VAC
Europe	CAB-AC-16A-SG-EU	14 ft (4.26 m)	16A, 250 VAC
India	CAB-AC-16A-SG-IND	14 ft (4.26 m)	16A, 250 VAC
International/UK	CAB-AC-16A-SG-IN	14 ft (4.26 m)	16A, 250 VAC
Israel	CAB-AC-16A-SG-IS	14 ft (4.26 m)	16A, 250 VAC
Italy	CAB-AC-16A-SG-IT	14 ft (4.26 m)	16A, 250 VAC
Japan	CAB-AC-16A-SG-JPN	14 ft (4.26 m)	16A, 250 VAC
South Africa	CAB-AC-16A-SG-SA	14 ft (4.26 m)	16A, 250 VAC
Switzerland	CAB-AC-16A-SG-SW	14 ft (4.26 m)	16A, 250 VAC
South Korea	CAB-AC-16A-SG-SK	14 ft (4.26 m)	16A, 250 VAC
UK	CAB-AC-16A-SG-UK	14 ft (4.26 m)	16A, 250 VAC
North America (non locking) 110 VAC operation	CAB-AC-20A-SG-US	14 ft (4.26 m)	20A, 110 VAC
North America (locking) 125 VAC operation	CAB-AC-20A-SG-US1	14 ft (4.26 m)	20A, 125 VAC
North America (non locking) 200-240 VAC operation	CAB-AC-20A-SG-US2	14 ft (4.26 m)	20A, 250 VAC
North America (locking) 200-240 VAC operation	CAB-AC-20A-SG-US3	14 ft (4.26 m)	20A, 250 VAC
North America 277 VAC operation	CAB-AC-20A-SG-US4	14 ft (4.26 m)	20A, 277 VAC
North America Cabinet Jumper Power Distribution unit (PDU)	CAB-AC-20A-SG-C20	14 ft (4.26 m)	20A, 250 VAC

Locale	Part Number	Length	Power Cord Rating
North America, Ring Terminal source plug	CAB-HV-25A-SG-US2	14 ft (4.26 m)	20A, 300 VAC/500 VDC
International IEC/EU, Ring Terminal source plug	CAB-HV-25A-SG-IN2	14 ft (4.26 m)	20A, 300 VAC/500 VDC

High-Voltage Input AC Power Cord Illustrations for Cisco 8200 Series Router

This section contains the AC power cord illustrations, as described in the above table.

Figure 37: CAB-AC-16A-SG-AR Power Cord

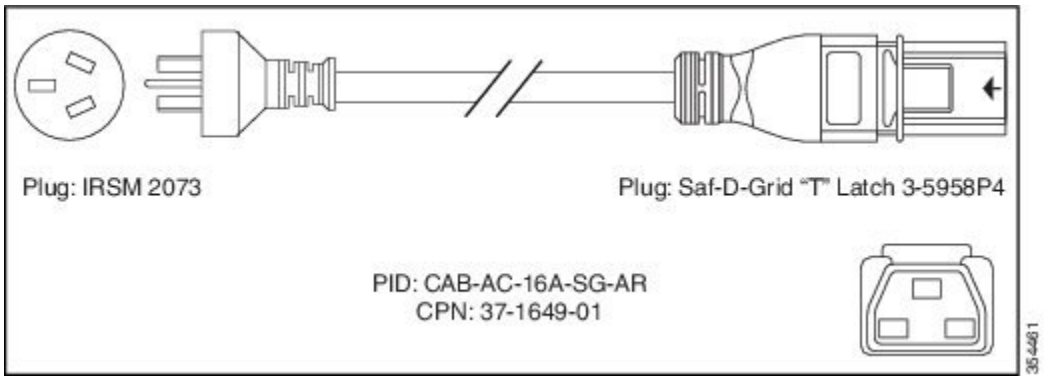


Figure 38: CAB-AC-16A-SG-AZ Power Cord

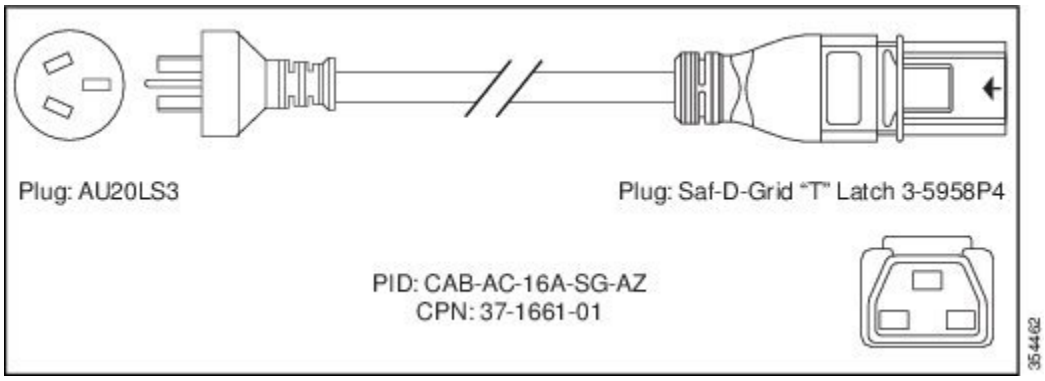


Figure 39: CAB-AC-16A-SG-BR Power Cord

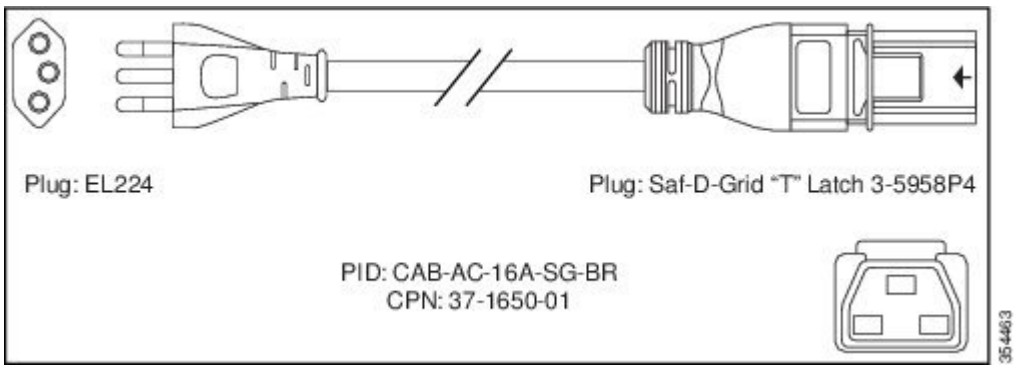


Figure 40: CAB-AC-16A-SG-CH Power Cord

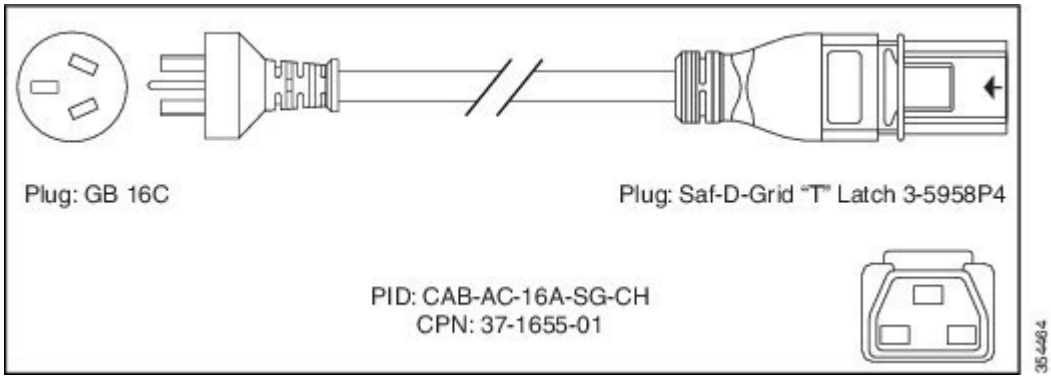


Figure 41: CAB-AC-16A-SG-EU Power Cord

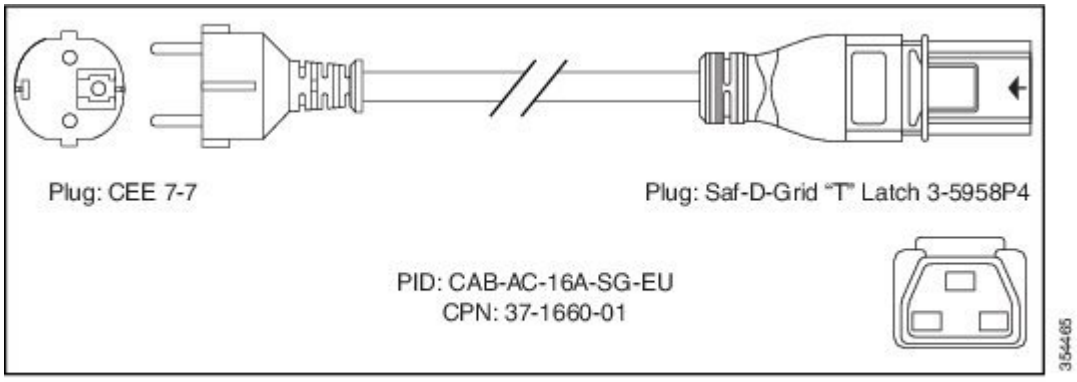


Figure 42: CAB-AC-16A-SG-IND Power Cord

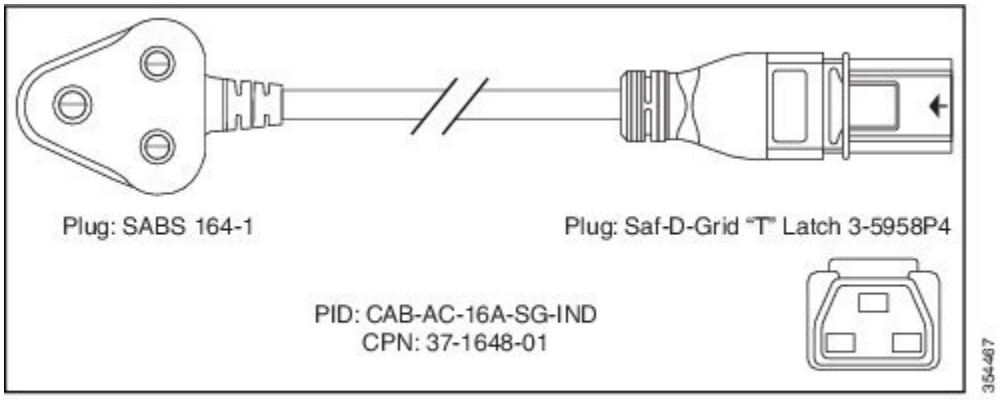


Figure 43: CAB-AC-16A-SG-IN Power Cord

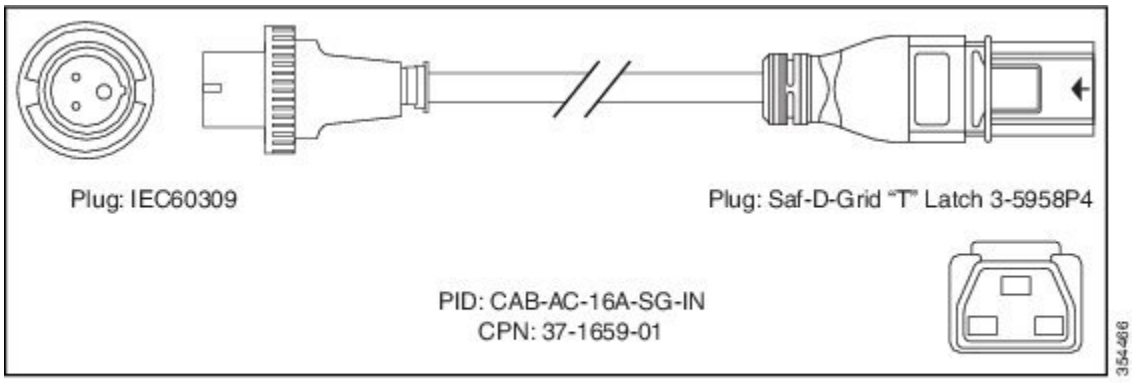


Figure 44: CAB-AC-16A-SG-IS Power Cord

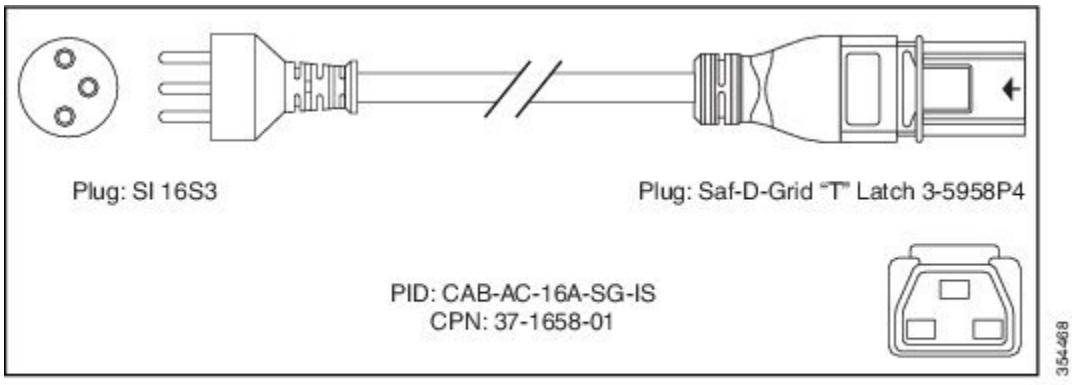


Figure 45: CAB-AC-16A-SG-IT Power Cord

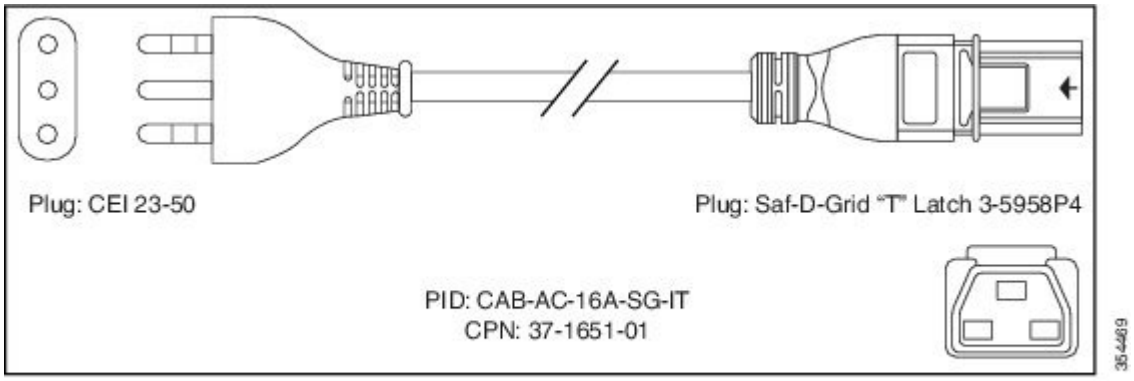


Figure 46: CAB-AC-16A-SG-JPN Power Cord

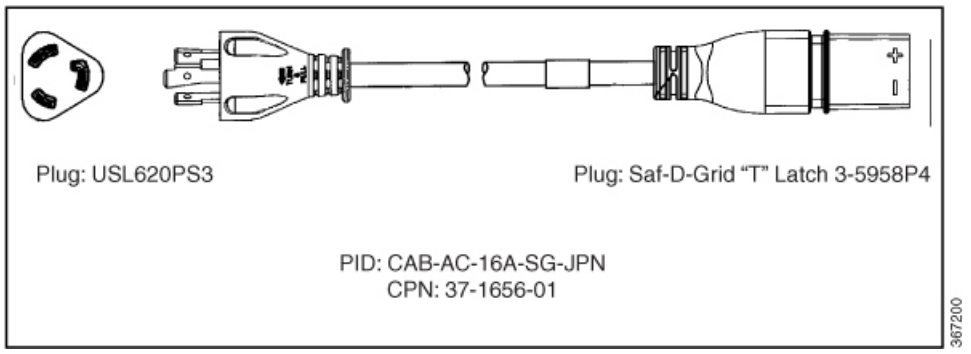


Figure 47: CAB-AC-16A-SG-SA Power Cord

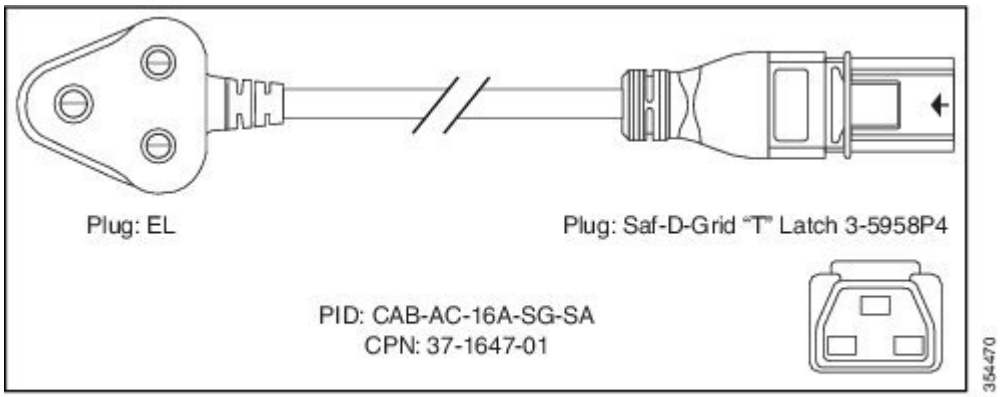


Figure 48: CAB-AC-16A-SG-SW Power Cord

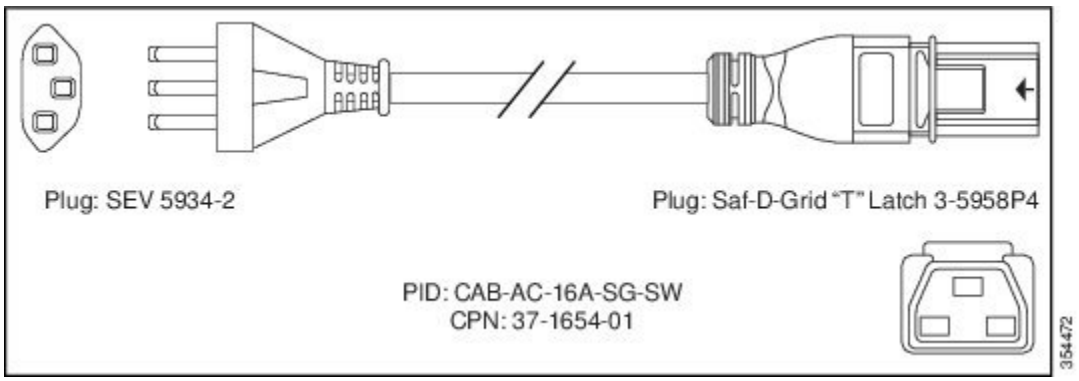


Figure 49: CAB-AC-16A-SG-UK Power Cord

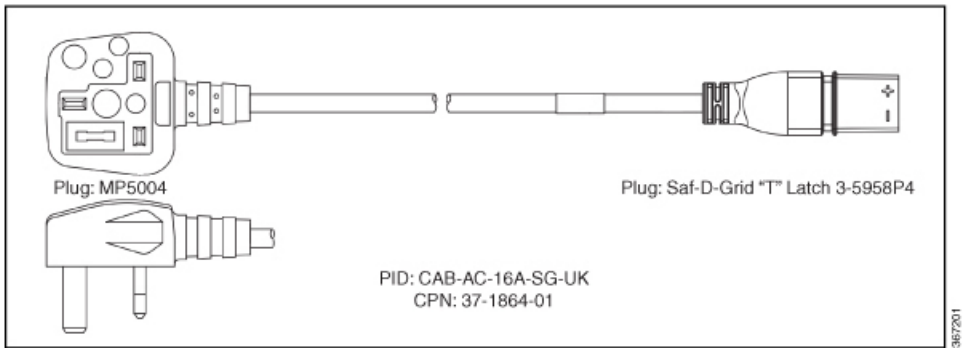


Figure 50: CAB-AC-20A-SG-US Power Cord

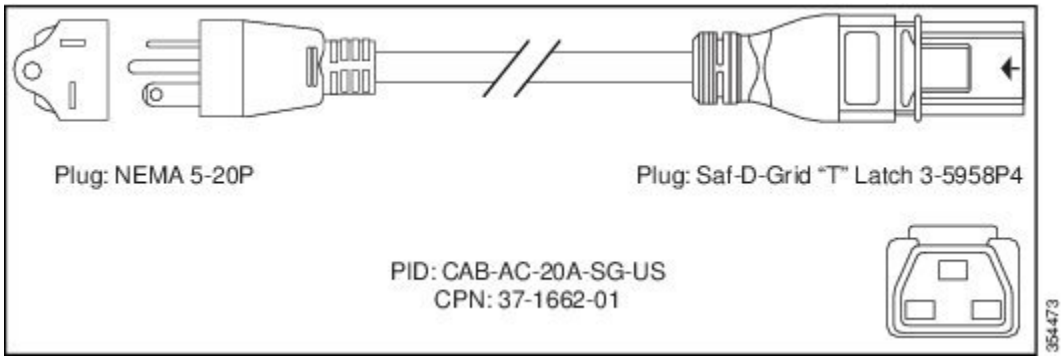


Figure 51: CAB-AC-20A-SG-US1 Power Cord

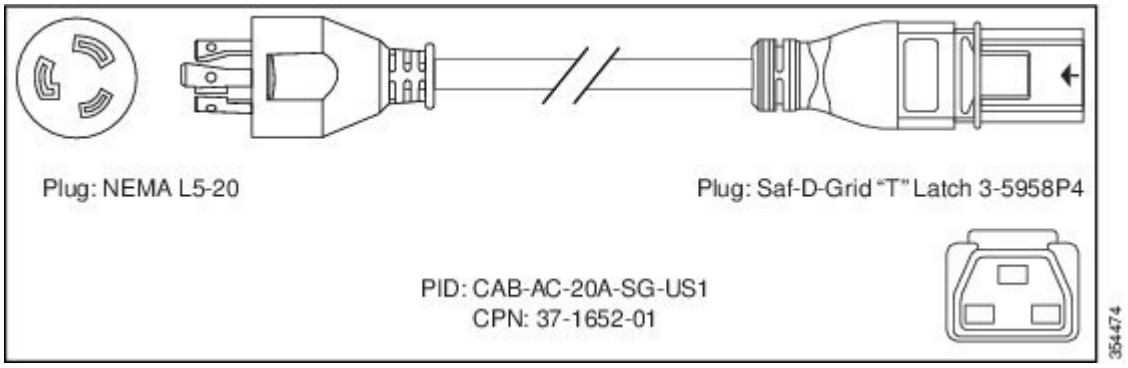


Figure 52: CAB-AC-20A-SG-US2 Power Cord

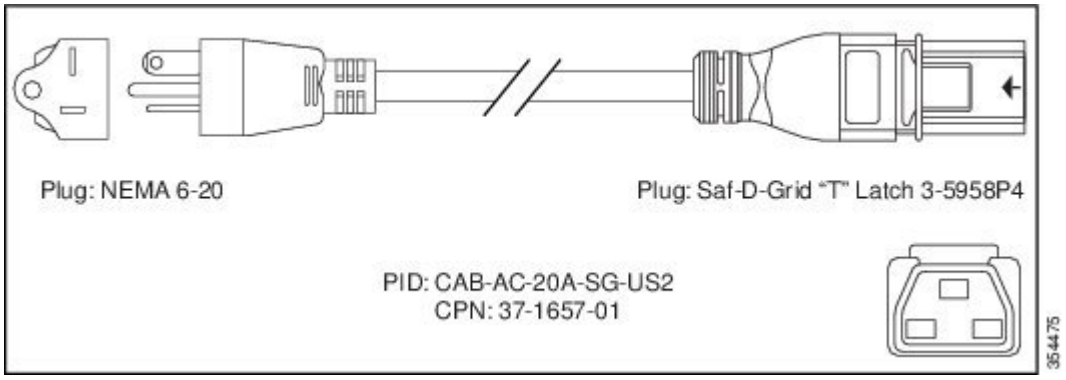


Figure 53: CAB-AC-20A-SG-US3 Power Cord

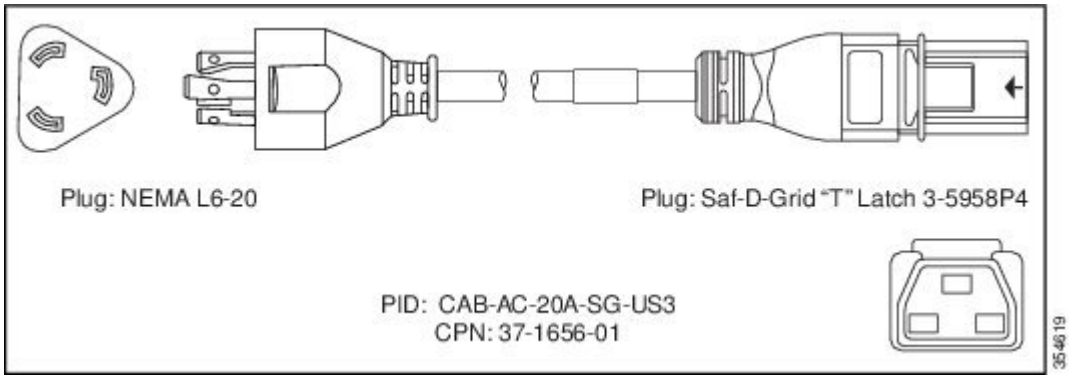


Figure 54: CAB-AC-20A-SG-US4 Power Cord

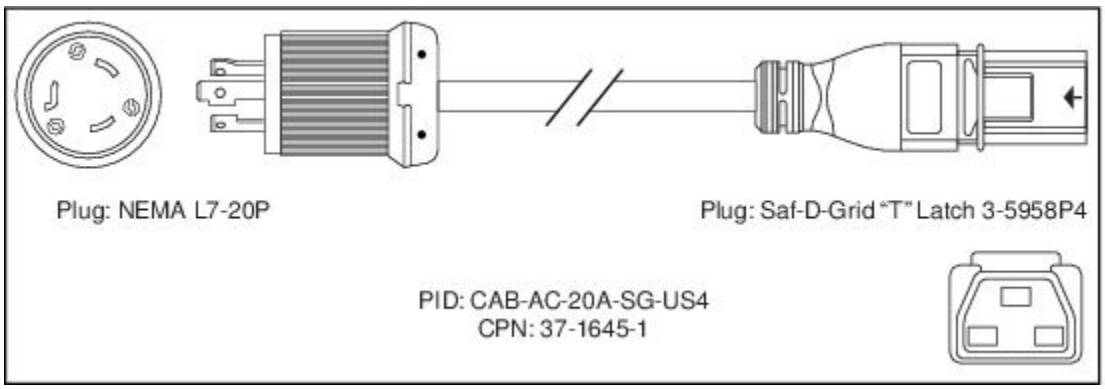


Figure 55: CAB-AC-20A-SG-C20 Power Cord

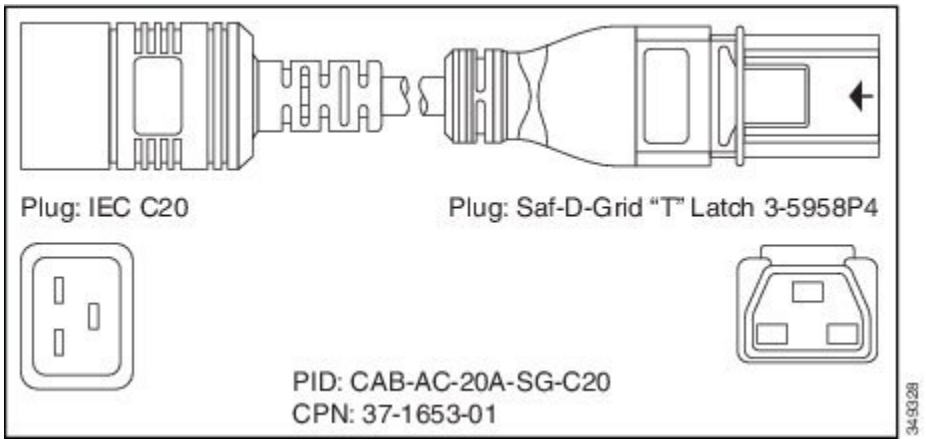


Figure 56: CAB-HV-25A-SG-US2 Power Cord

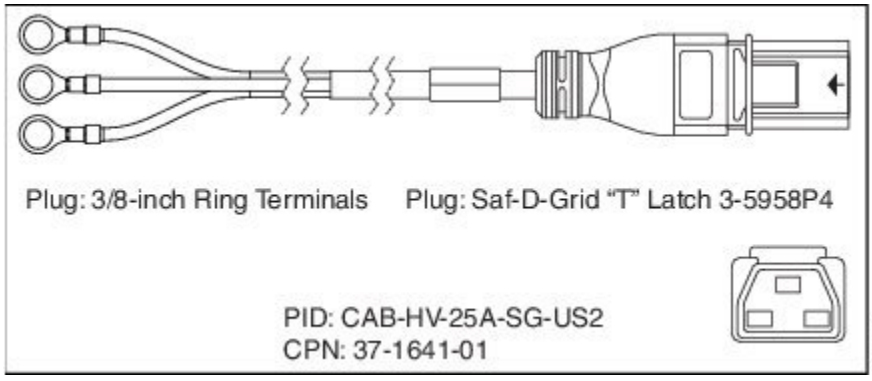


Figure 57: CAB-HV-25A-SG-IN2 Power Cord

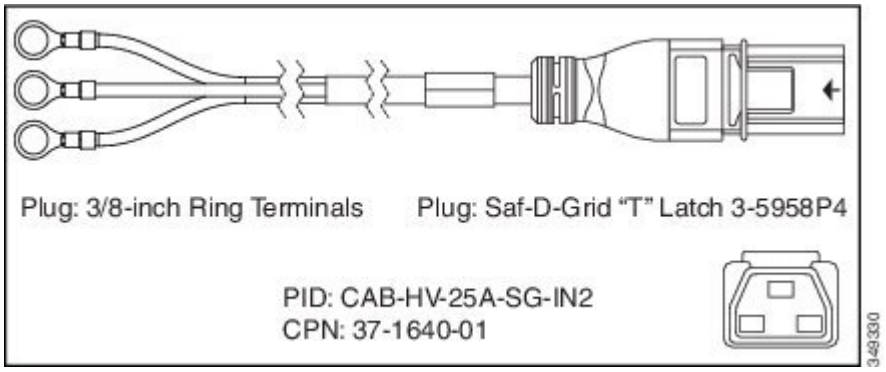
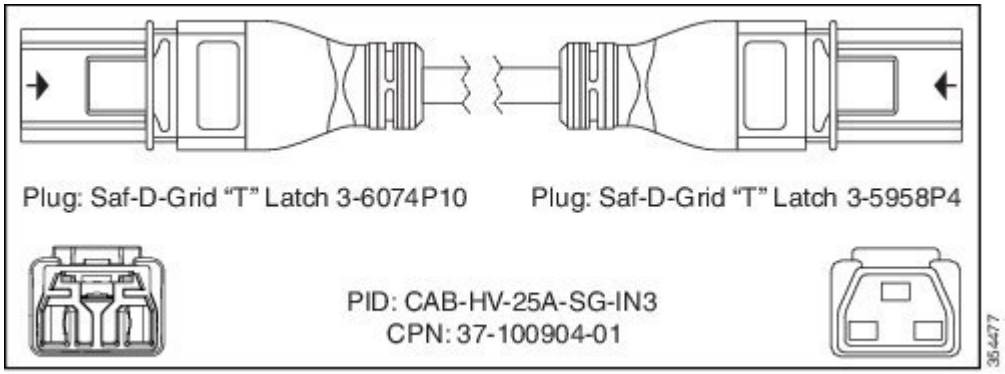


Figure 58: CAB-HV-25A-SG-IN3 Power Cord



Connect DC Power to 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.

Note For information on power supplies, see Power Supply Unit Input and Output Ranges, on page 47

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.

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.
- For the PSU3KW-DCPI-ORV3 DC power supply, you may use either the CAB-DC-ORV3-S (290 mm) or the CAB-DC-ORV3-L (600 mm) DC power cable. Please note that the power supply cord must be purchased separately from Cisco.

Note

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 In case of PSU2KW-DCPI/PE and PSU3KW-DCPI-ORV3 PSU, insert the DC connector into the DC receptacle on the power supply.

Figure 59: Connecting DC Power - Cisco 8202 Fixed Port Router

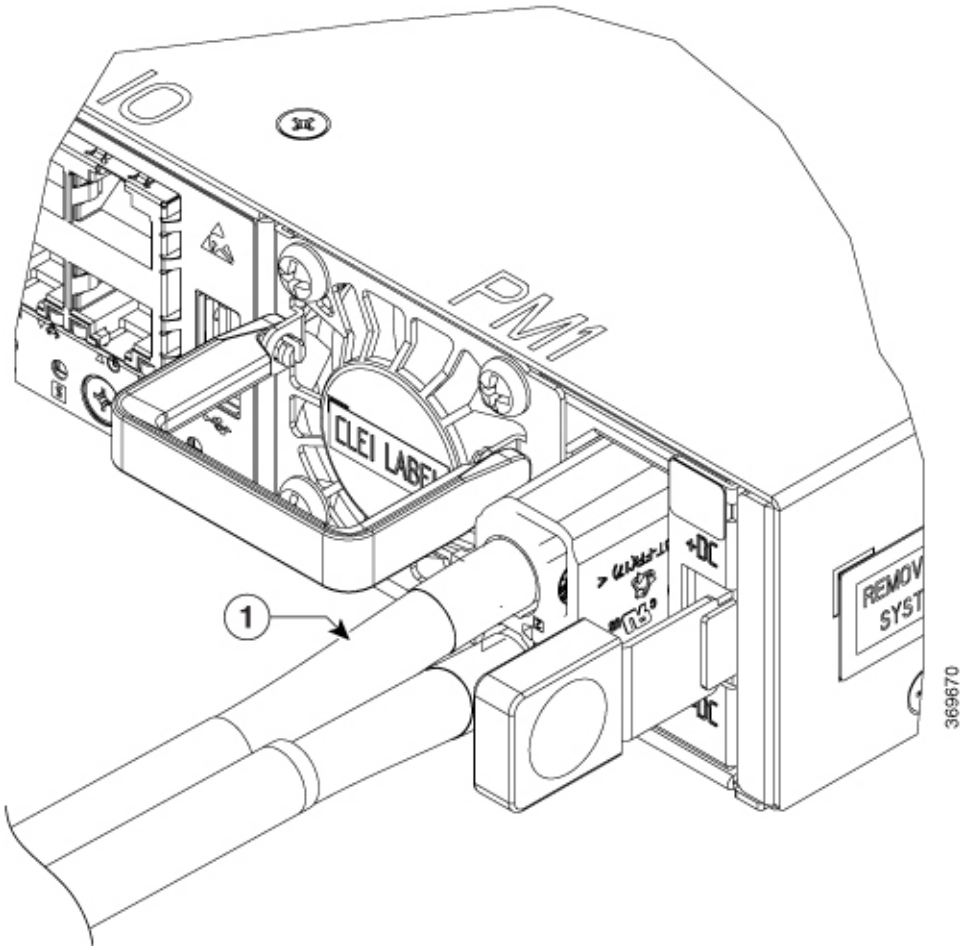


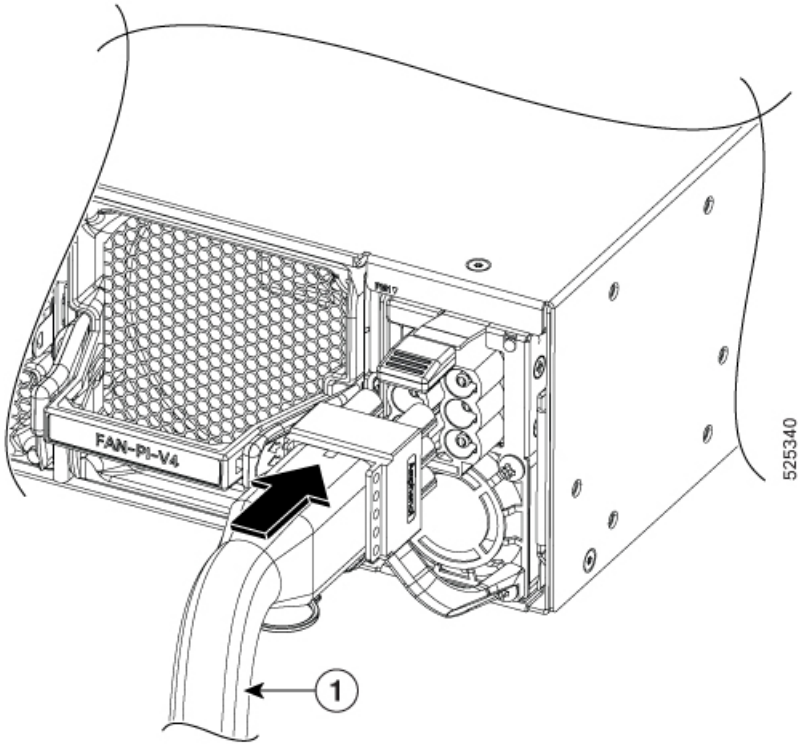
Figure 60: Connecting DC Power - Cisco 8201-32FH Router



Note

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

Figure 61: Connecting DC Power - PSU3KW-DCPI-ORV3



1	DC power cable

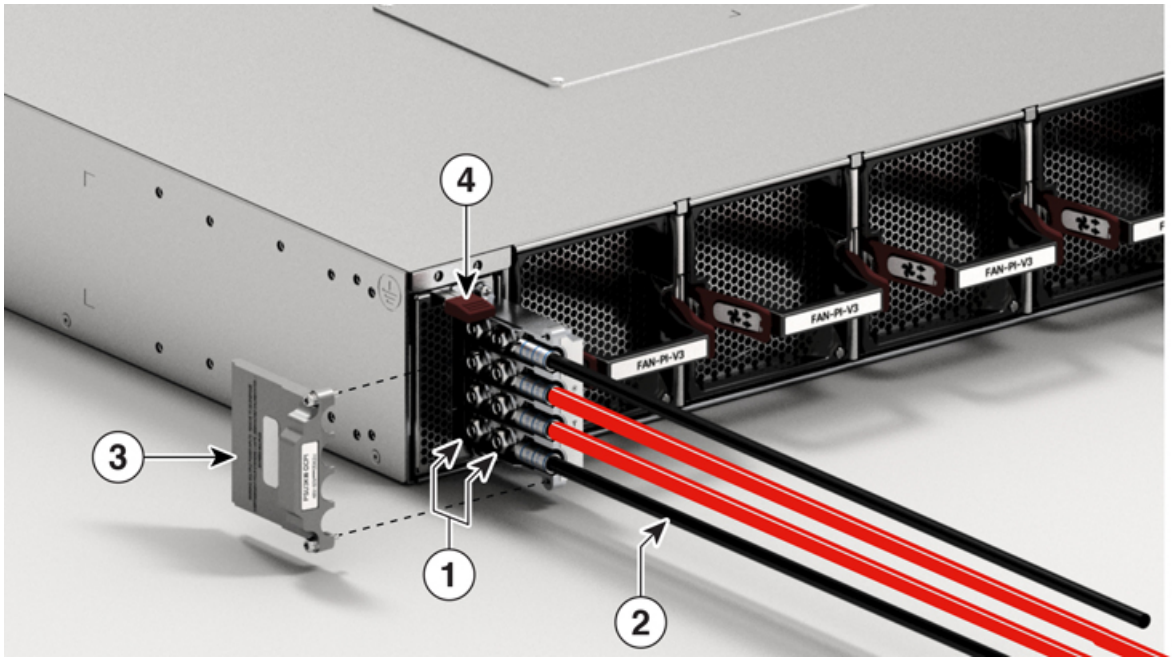
Step 6 In case of PSU3KW-DCPI PSU, to connect the cable to the PSU that has lug holes:

a. Open the DC terminal block cover.

b. Connect red DC power cables to A+ and B+ terminals and black DC power cables to A- and B- terminals.

c. Tighten the 2-hole lug nuts to a torque value of 20 in-lb.

Figure 62: Connect the DC power cables



1	2-hole lug nuts	3	Terminal block cover
2	DC power cables	4	Tab

d. Close the DC terminal block cover. Tighten the cover screws to a torque value of 5 in-lb.

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

Connect High Voltage Power Supply Unit to Power Source

The high voltage PSU (PSU2KW-HVPI or PSU3KW-HVPI) accepts AC, HVAC, or HVDC input power. The HVPI power supply has Anderson power connector for Saf-D-Grid T-latch power cord that can be used for AC, HVAC, or HVDC power.

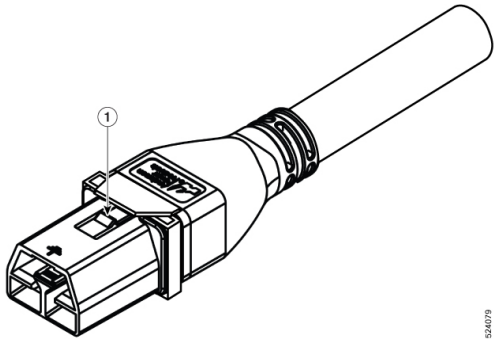
Procedure

Step 1 Choose your power source (AC, HVAC, or HVDC) and use the Saf-D-Grid T-latch power cord to connect to the PSU.

For power cord details, see Table 9: High-Voltage Input Power Cord Options for Cisco 8200 Series Router, on page 51.

Note
To remove the Saf-D-Grid power cord from the power supply, press the latch before pulling the power cord out.

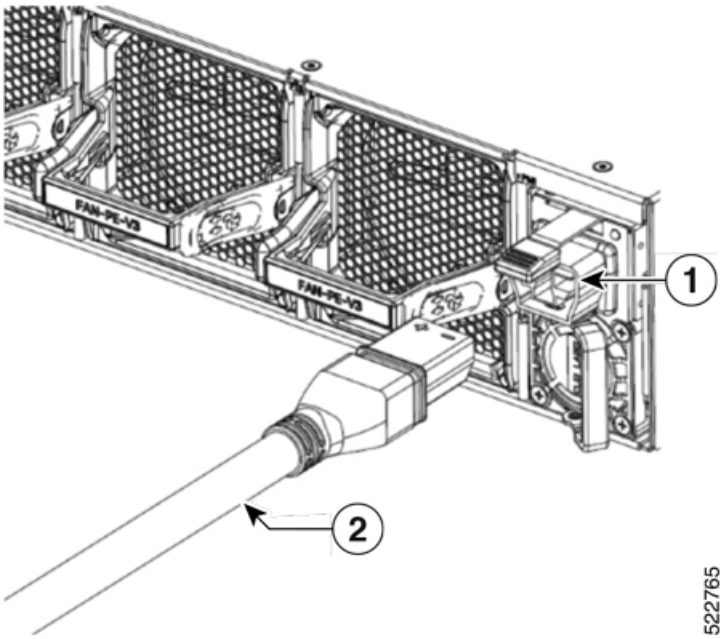
Figure 63: Latch on the Saf-D-Grid power cord



1	Latch

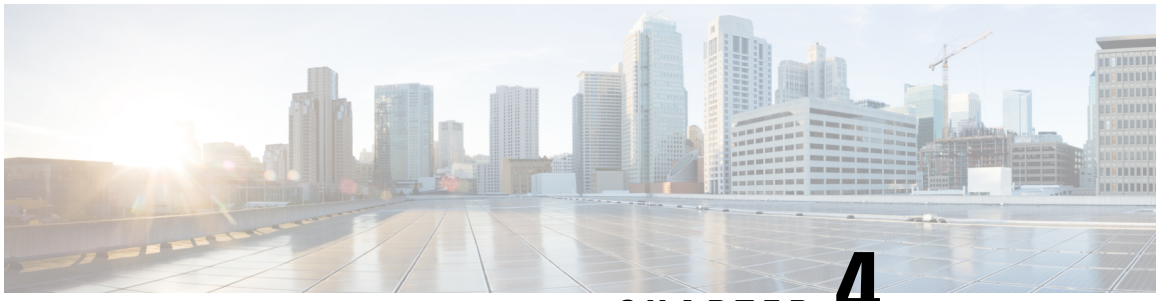
Step 2 Verify that the Saf-D-Grid plug is plugged in completely to secure the built-in retaining latch.

Figure 64: High Voltage (AC, HVAC, or HVDC) Power Connection



1	Anderson power connector	2	Saf-D-Grid T-latch power cord

Step 3 Turn on the circuit breaker for the AC, HVAC, or HVDC power source circuit.



CHAPTER 4

Connect Router to the Network

- Port Connection Guidelines , on page 67
- Interfaces and Port Description, on page 68
- Connecting a Console to the Switch, on page 76
- Create the Initial Router Configuration, on page 78
- Connect the Management Interface, on page 80
- Install Dust Caps, on page 80
- Install and Remove Transceiver Modules, on page 81
- Connect Interface Ports, on page 89
- Maintain Transceivers and Optical Cables, on page 89
- Verify Chassis Installation, on page 89

Port Connection Guidelines

Depending on the chassis , you can use optical modules and RJ-45 connectors to connect the ports to other network devices.

To prevent damage to the fiber-optic cables, we recommend that you keep the transceivers disconnected from their fiber-optic cables when installing the transceiver in the line card. Before removing a transceiver from the switch, remove the cable from the transceiver.

To maximize the effectiveness and life of your transceivers and optical cables, ensure the following:

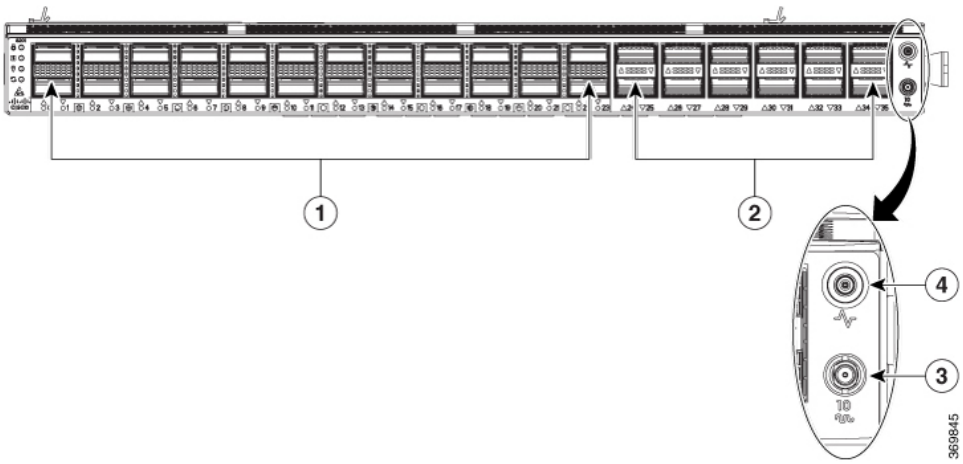
- Wear an ESD-preventative wrist strap that is connected to an earth ground whenever you handle transceivers.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep the transceivers and fiber-optic cables clean and dust free to maintain high signal accuracy and to prevent damage to the connectors. Attenuation (loss of light) is increased by contamination. Connector loss should be kept below 0.35 dB.
    - Clean these parts before installation to prevent dust from scratching the fiber-optic cable ends.
    - Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors when they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedures.

- Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.

- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.

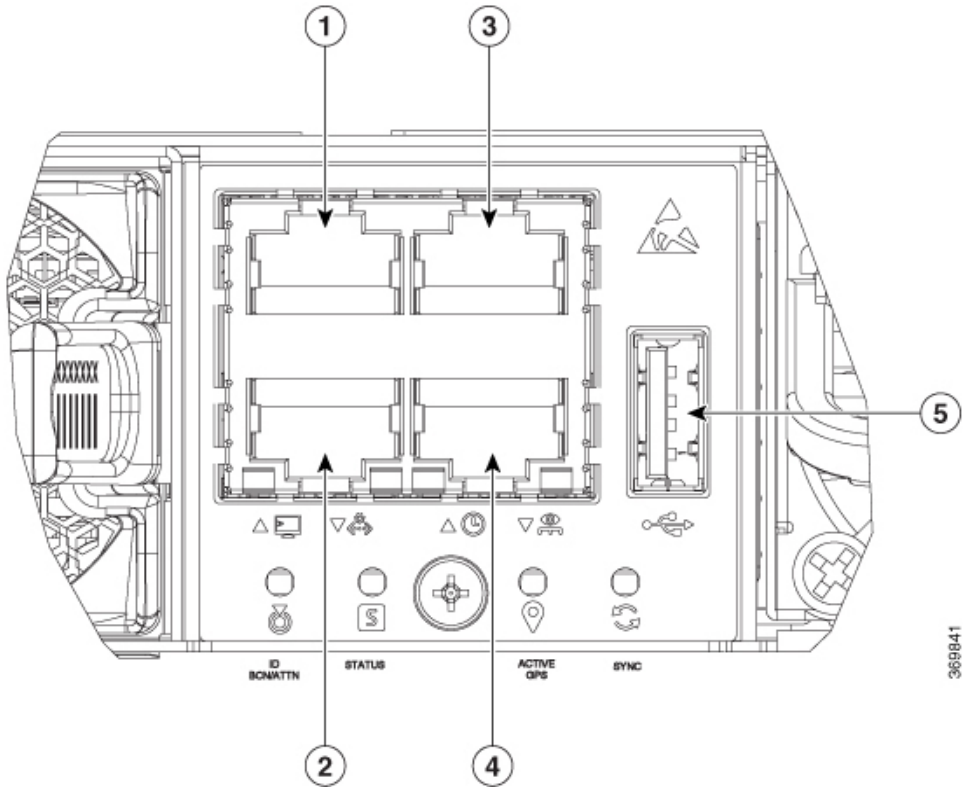
Interfaces and Port Description

Figure 65: Cisco 8201 Fixed Port Router - Front View



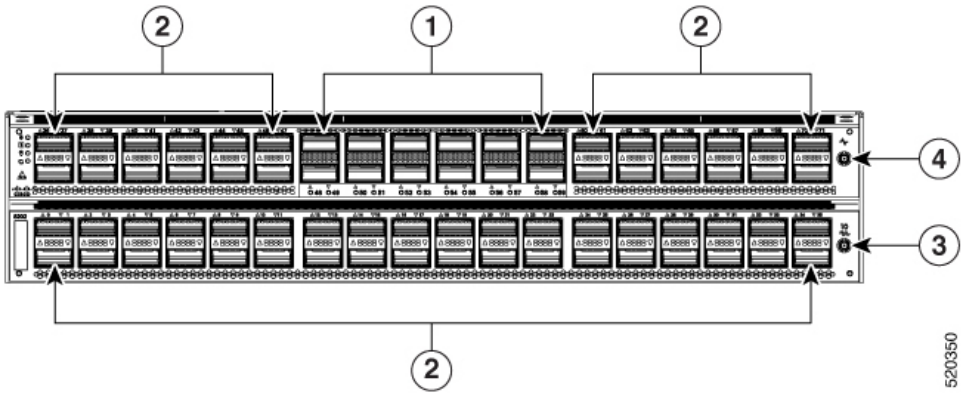
1	400G Ports (Port 0 to Port 23). 400G port supports 40GE, 100GE, 200GE, and 400GE. All 400G port support breakout operation.	**3**	Mini coax connector for 10MHz, input, and output.
2	100G ports (Port 24 to Port 35) support 100G and 40G. Ports 24, 26, 28, 30, 32, and 34 support 4x10G and 4x50G via breakout cable.	**4**	Mini coax connector for 1 PPS, input, and output.

Figure 66: Cisco 8201 Fixed Port Router - Rear View



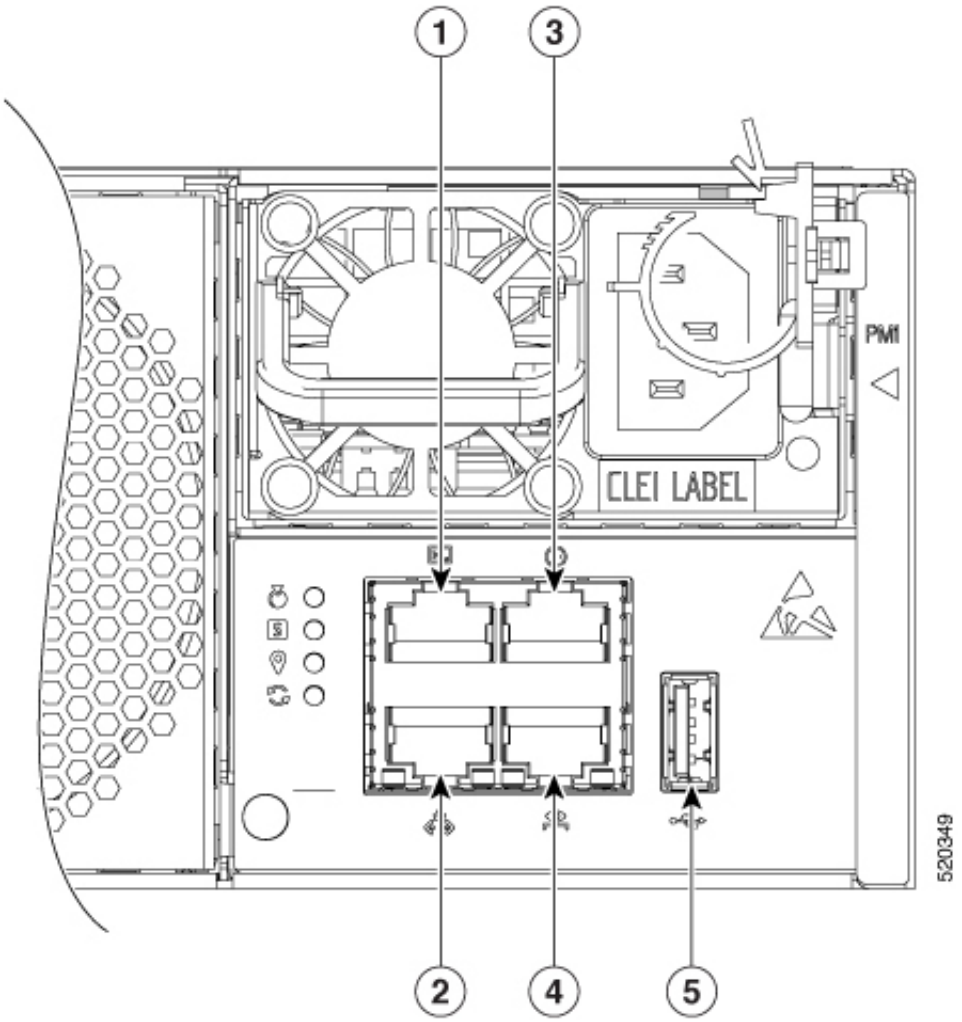
1	Console Port	**4**	1000BASE-T Management and BMC (Baseboard Management Controller) Port
2	10GBASE-T Control Plane Expansion Port	**5**	USB Port Type-A
3	RJ-45 connector for Time-of-Day (TOD) interface, input, and output		

Figure 67: Cisco 8202 Fixed Port Router - Front View



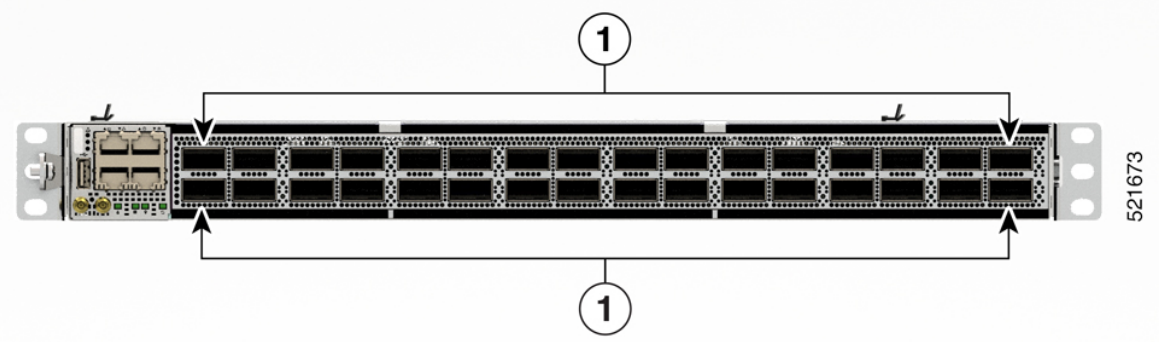
1	400G Ports. All 400G port support breakout operation.	3	1.0/2.3 50 ohm connector for 10MHz, input, and output.
2	100G ports and even ports support 4x10G and 4x50G	4	1.0/2.3 50 ohm connector for 1 PPS, input, and output.

Figure 68: Cisco 8202 Fixed Port Router - Rear View



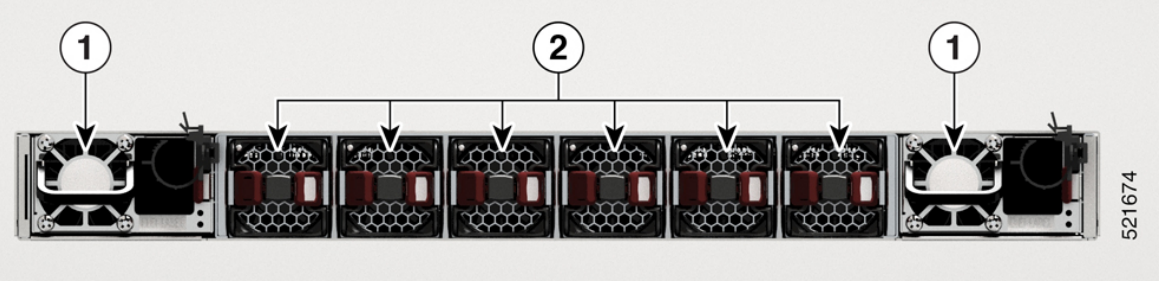
1	Console Port	**4**	1000BASE-T Management and BMC (Baseboard Management Controller) Port
2	10GBASE-T Control Plane Expansion Port	**5**	USB Port Type-A
3	RJ-45 connector for Time-of-Day (TOD) interface, input, and output		

Figure 69: Cisco 8201-32FH Router - Front View



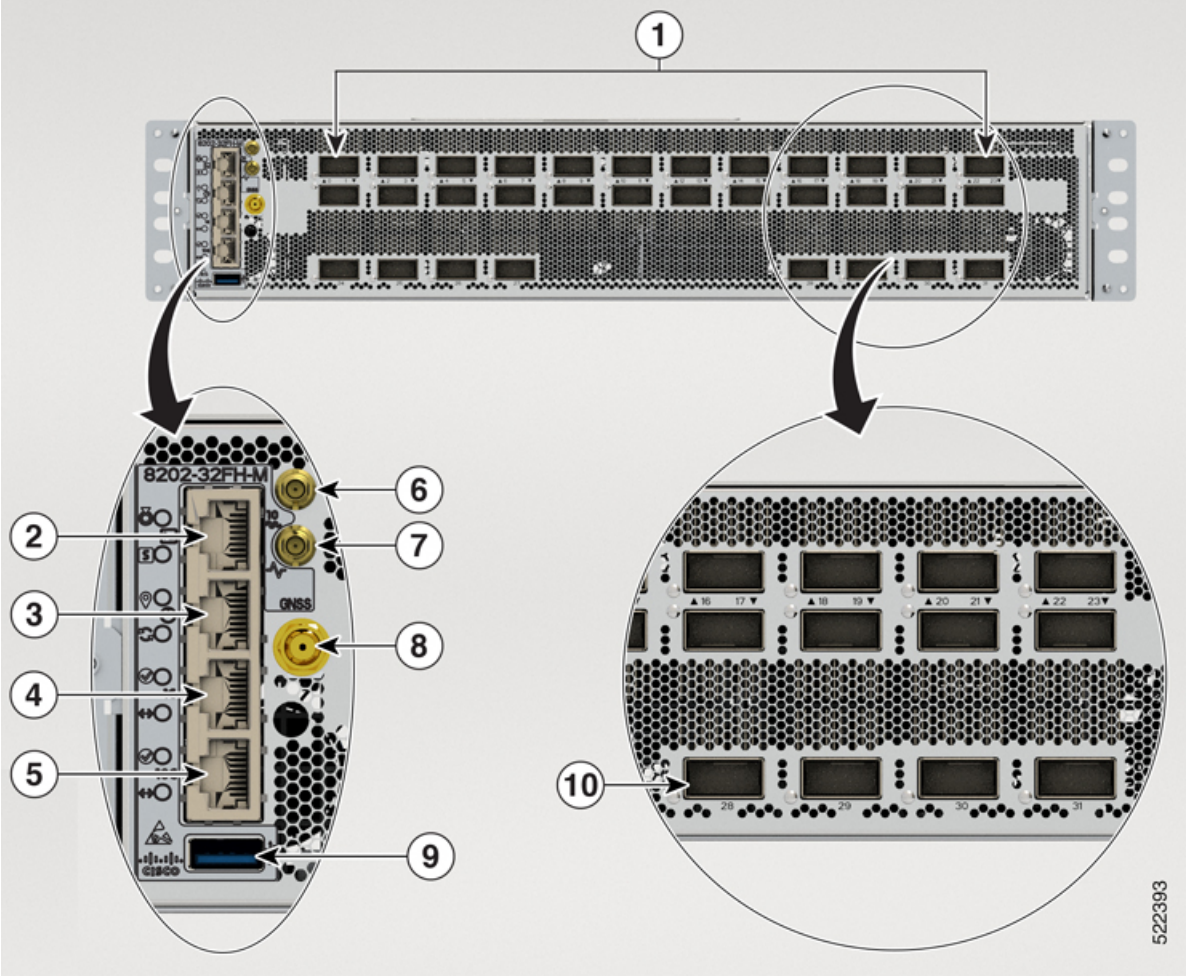
1	400G QSFP-DD Ports. All 400G port support breakout operation.

Figure 70: Cisco 8201-32FH Router - Rear View



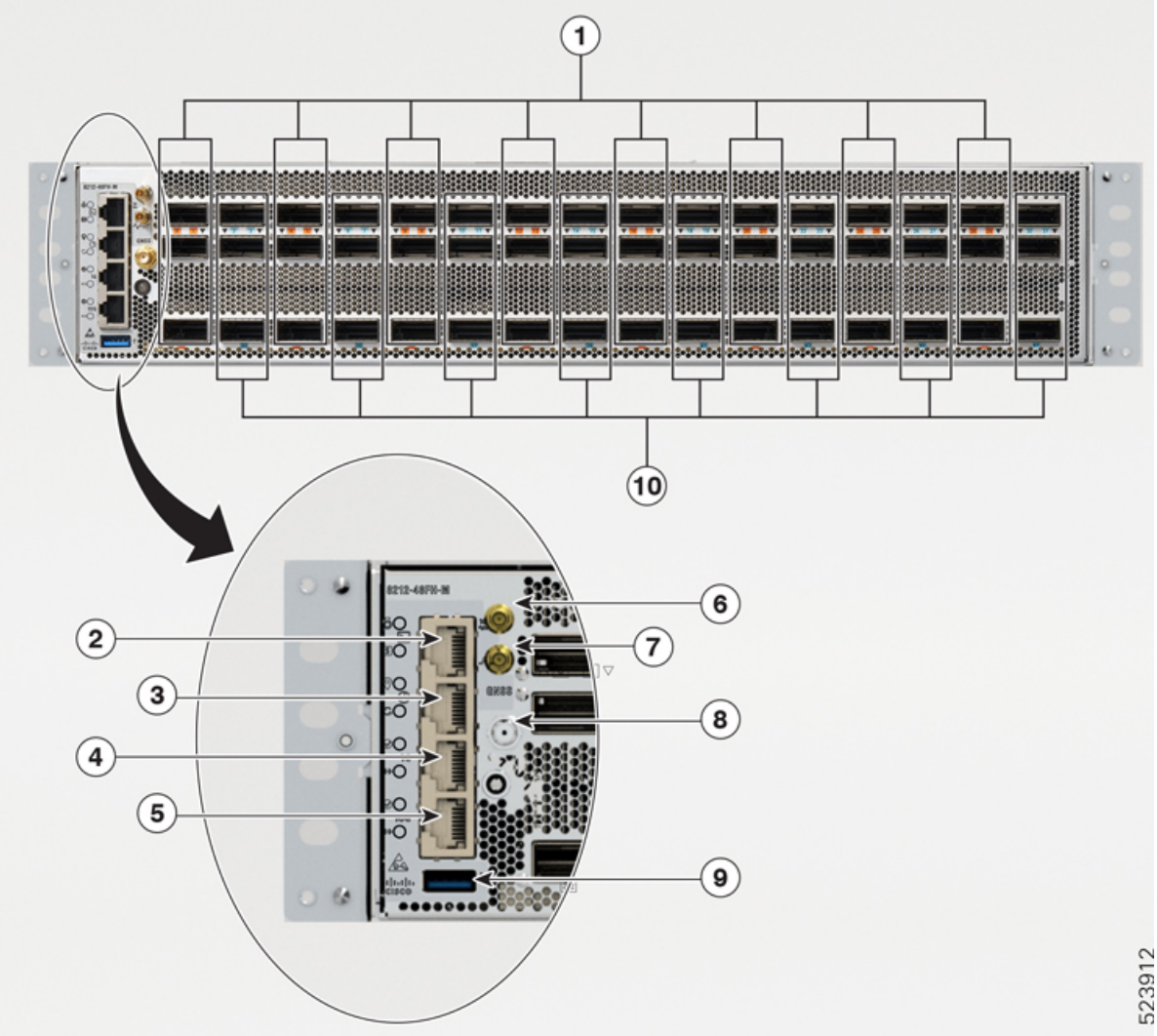
1	Power Supply	**2**	Fans

Figure 71: Cisco 8202-32FH-M Router - Front View



1	400G QSFP-DD Ports. All 400G port support breakout operation.	6	Mini coax connector for 1 PPS, input, and output.
2	Console	7	Mini coax connector for 10MHz, input, and output.
3	Time of the Day (TOD) Port	8	GNSS Port
4	1G Management Port	9	USB Port Type-A
5	10G Control Plane Expansion Port	10	400G QSFP-DD Ports. All 400G port support breakout operation.

Figure 72: Cisco 8212-48FH-M Router - Front View

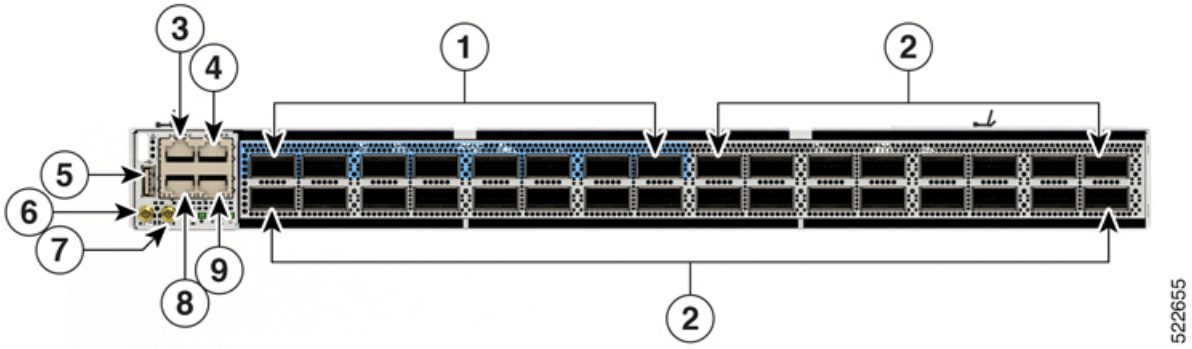


1	24 QSFP-DD800 Ports. These ports support the following breakout operation: • 2x100 GbE • 4x100 GbE • 4x10 GbE • 4x25 GbE	6	Mini coax connector for 10MHz, input, and output.
2	Console	7	Mini coax connector for 1 PPS, input, and output.
3	Time of the Day (TOD) Port	8	GNSS Port
4	1G Management Port	9	USB Port 3.0 Type-A

5	10G Control Plane Expansion Port	10	24 QSFP56-DD Ports. These ports support the following breakout operation: • 2x100 GbE • 4x100 GbE • 4x10 GbE • 4x25 GbE

Note On Cisco 8212-48FH-M router, only ports 0 through 31 support 40GbE traffic or 4x10GbE breakout operations.

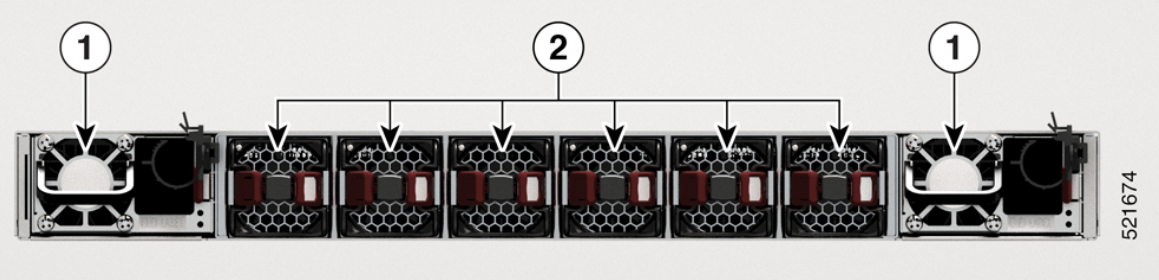
Figure 73: Cisco 8201-24H8FH Router - Front View



1	8 QSFP-DD 400 GbE ports. All 400 GbE ports support breakout operation: • 2x100 GbE • 4x100 GbE • 4x10 GbE • 4x25 GbE • 8x50 GbE • 2x40 GbE	6	Mini coax connector for 10MHz, input, and output.
2	24 QSFP28 100 GbE ports. All 100 GbE ports support breakout operation: • 4x10 GbE • 4x25 GbE • 2x50 GbE • 2x40 GbE	7	Mini coax connector for 1 PPS, input, and output.

3	Console port.	8	10GBASE-T Control Plane Expansion Port
4	RJ-45 connector for Time-of-Day (TOD) interface, input, and output.	9	1000BASE-T Management and BMC (Baseboard Management Controller) Port
5	USB Port Type-A.		

Figure 74: Cisco 8201-24H8FH Router - Rear View



1	Power Supply	**2**	Fans

1	64 QSFP-DD800 Ports. These ports support the following breakout operation: • 2x100 GbE • 4x100 GbE • 4x10 GbE • 4x25 GbE	7	Mini coax connector for 10MHz, input, and output.
2	Mini coax connector for 10MHz, input, and output.	8	Mini coax connector for 1 PPS, input, and output.
3	Mini coax connector for 1 PPS, input, and output.	9	GNSS Port
4	RJ-45 connector	10	USB Port 3.0 Type-A
5	USB 3.0 Type-C	11	24 QSFP56-DD Ports. These ports support the following breakout operation: • 2x100 GbE • 4x100 GbE • 4x10 GbE • 4x25 GbE
6	USB 3.0 Type-C		

1	64 OSFP800 Ports.	7	Mini coax connector for 10MHz, input, and output.
2	Mini coax connector for 10MHz, input, and output.	8	Mini coax connector for 1 PPS, input, and output.
3	Mini coax connector for 1 PPS, input, and output.	9	GNSS Port
4	RJ-45 connector	10	USB Port 3.0 Type-A
5	USB 3.0 Type-C	11	24 QSFP56-DD Ports. These ports support the following breakout operation: • 2x100 GbE • 4x100 GbE • 4x10 GbE • 4x25 GbE
6	USB 3.0 Type-C		

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

- For QSFP-DD data sheets, refer to the Cisco 400G QSFP-DD Cable and Transceiver Modules Data Sheet.
- For QSFP28 data sheets, refer to the Cisco 100GBASE QSFP-100G Modules Data Sheet.
- For QSFP+ data sheets, refer to the Cisco 40GBASE QSFP Modules Data Sheet.

Connecting a Console to the Switch

Before you create a network management connection for the switch or connect the switch to the network, you must create a local management connection through a console terminal and configure an IP address for the switch. The switch 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 switch 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 console device capable of asynchronous transmission. Typically, you can use a computer terminal as the console device.

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

Before you begin

- The switch must be fully installed in its rack. The switch 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 switch.

Procedure

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

- 115200 baud
- 8 data bits
- 2 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 switch configuration.

Create the Initial Router Configuration

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

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

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

When the system is powered on and the console port is connected to the terminal, the RP CPU messages are seen. You can toggle between BMC CPU messages and RP CPU messages by pressing the hot-key sequence Ctrl-O.

Note The Cisco 8201-32FH and Cisco 8201-24H8FH Routers do not support BMC.

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

Before you begin

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

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.

Step 7 Enter a network mask for the management interface.

Step 8 The software asks whether you want to edit the configuration.

- **no** - select this option if you don't want to edit your configuration.
- **yes** - select this option if you want to edit your configuration.

  Note
  We recommend that you configure the system location altitude for fan control. This configuration allows you to specify the chassis altitude, so the router can adjust the fan speed to compensate for lower cooling capability at higher altitudes. For more details, see the **environment altitude** command.

Connect the Management Interface

The 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.

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.

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.

Install Dust Caps

Install dust caps to protect unused or unconnected optical ports on the Cisco 8200 Series Routers.

The following list provides the product IDs (PIDs) for the dust caps that are available for each port type:

PID	Description
8000-QSFP-DCAP	Cisco 8000 Series Dust cover for QSFP/QSFP56-DD (Qty: 1 per Kit)

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

Figure 75: Dust Cap



To install the dust cap:

1. Hold the dust cap by its handle.
2. Insert the dust cap in to the appropriate unused ports on the chassis.

Install and Remove Transceiver Modules

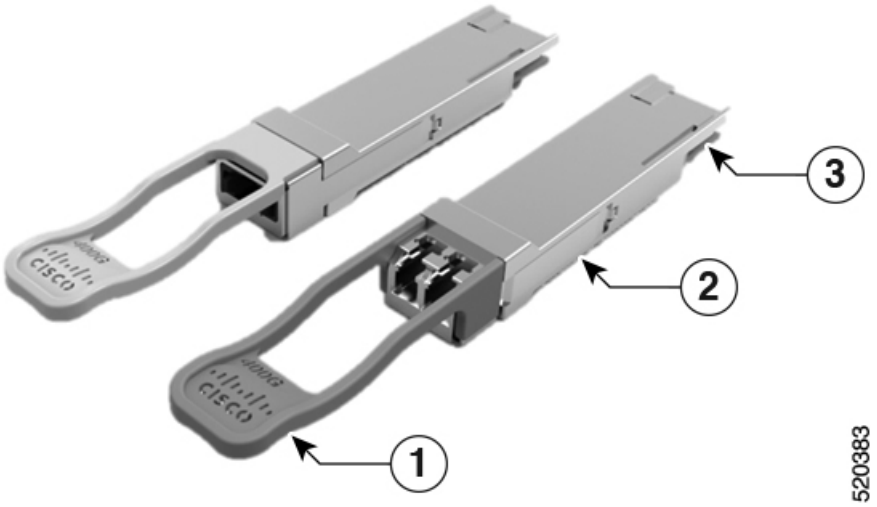
Install and Remove QSFP Transceiver Modules

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.

Caution When inserting optical transceiver modules into host ports, handle them carefully. Ensure that the applied force does not exceed 20 lbs (9.1kg).

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

Figure 76: 400-Gigabit QSFP-DD Transceiver Module



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

Required Tools and Equipment

You need these tools to install the transceiver modules:

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

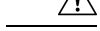
Installing the Transceiver Module

Warning **Statement 1079**—Hot Surface

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



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



Caution Protect the transceiver ports by inserting clean dust caps (8000-QSFP-DCAP) into any ports not in use and do not have optical modules plugged in. If optical modules are plugged in but not in use, the dust caps that were supplied with the optical modules, should be used to protect the TX and RX surfaces of the optical module.

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

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

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

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

Table 10: Supported Ports and Operating Temperature of QDD-400G-ZR-S, QDD-400G-ZRP-S, and DP04QSDD-HE0 Optical Modules

Fixed-Port Routers	Port Side Intake Fans and Power Supplies	Port Side Exhaust Fans and Power Supplies	Port Side Intake Operating Temperature
Cisco 8201	• QDD-400G-ZR-S – supported on all 400G ports • QDD-400G-ZRP-S – supported on even-numbered 400G ports • DP04QSDD-HE0 – supported on top 400G ports	• QDD-400G-ZR-S – not supported • QDD-400G-ZRP-S – not supported • DP04QSDD-HE0 – not supported	40° C at sea level or 35° C at 1500 meter
Cisco 8202	• QDD-400G-ZR-S – supported on all 400G ports • QDD-400G-ZRP-S – supported on even-numbered 400G ports • DP04QSDD-HE0 – supported on top 400G ports	• QDD-400G-ZR-S – not supported • QDD-400G-ZRP-S – not supported • DP04QSDD-HE0 – not supported	40° C at sea level or 35° C at 1500 meter

8201-32FH	• QDD-400G-ZR-S – supported on all 400G ports • QDD-400G-ZRP-S – supported on even-numbered 400G ports • DP04QSDD-HE0 – supported on all 400G ports	• QDD-400G-ZR-S – not supported • QDD-400G-ZRP-S – not supported • DP04QSDD-HE0 – not supported	40° C at sea level or 35° C at 1500 meter
Cisco 8201-24H8FH	• QDD-400G-ZR-S – supported on all 400G ports • QDD-400G-ZRP-S – supported on all 400G ports • DP04QSDD-HE0 – supported on all 400G ports	• QDD-400G-ZR-S – not supported • QDD-400G-ZRP-S – not supported • DP04QSDD-HE0 – not supported	40° C at sea level or 35° C at 1500 meter
8202-32FH-M	• QDD-400G-ZR-S – supported on all 400G ports • QDD-400G-ZRP-S – supported on all 400G ports • DP04QSDD-HE0 – supported on all 400G ports	NA	40° C at sea level or 35° C at 1500 meter

Note The 8201-32FH fixed-port router must be operated only with 2kW power supplies while using the QDD-400G-ZR-S and QDD-400G-ZRP-S optical modules. These optical modules are not supported when 1.4KW power supplies are used.

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.

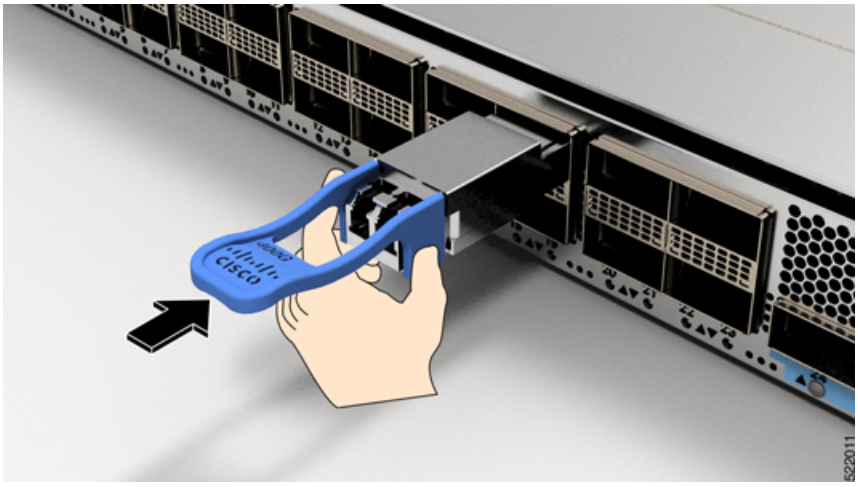
Step 2 Remove the transceiver module from its protective packaging.

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.

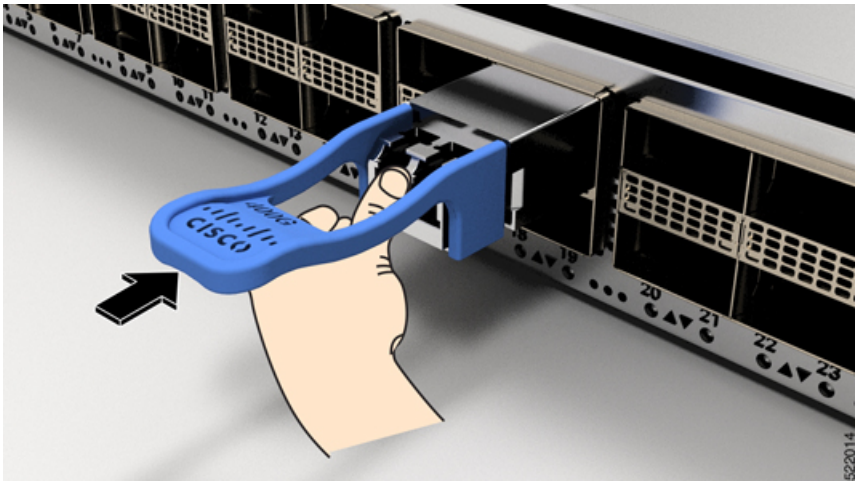
Figure 77: Installing the QSFP Transceiver Module



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

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

Figure 78: Seating the QSFP Transceiver Module



Attach the Optical Network Cable

Before you begin

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

- Keep the protective dust plugs installed in the unplugged fiber-optic cable connectors and in the transceiver optical bores until you are ready to make a connection.

- Inspect and clean the optical connector end faces just before you make any connections.
- Grasp the optical connector only by the housing to plug or unplug a fiber-optic cable.

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

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

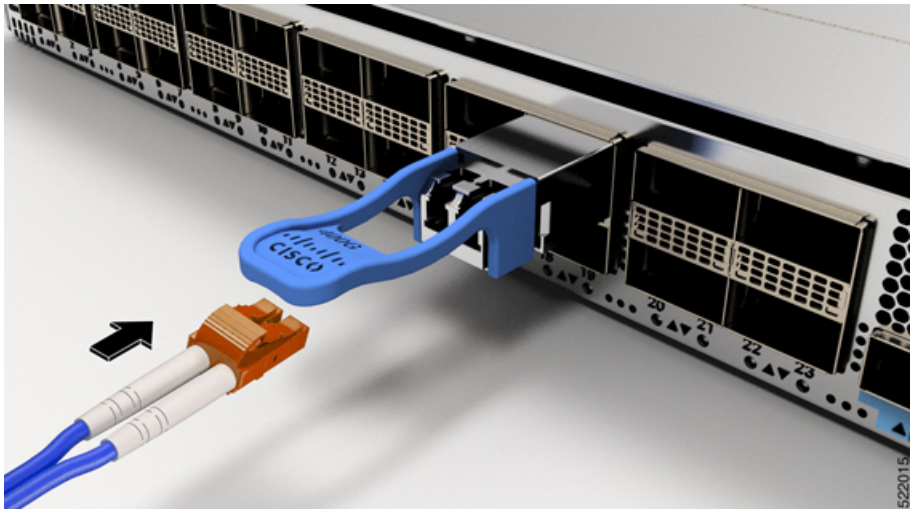
Note Inspect the MPO connector for the correct cable type, cleanliness, and any damage. For complete information on inspecting and cleaning fiber-optic connections, see the *Inspection and Cleaning Procedures for Fiber-Optic Connections* document.

Procedure

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

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

Figure 79: Cabling a Transceiver Module



Removing the Transceiver Module

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

To remove a transceiver module, follow these steps:

Procedure

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

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

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

Figure 80: Removing the QSFP Transceiver Module

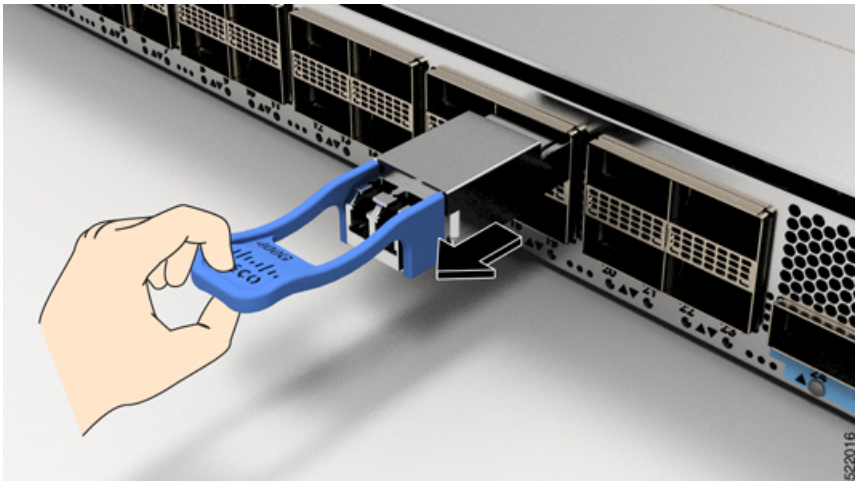


Figure 81: Removing the QSFP Transceiver Module from Cisco 8202-32FH-M Router

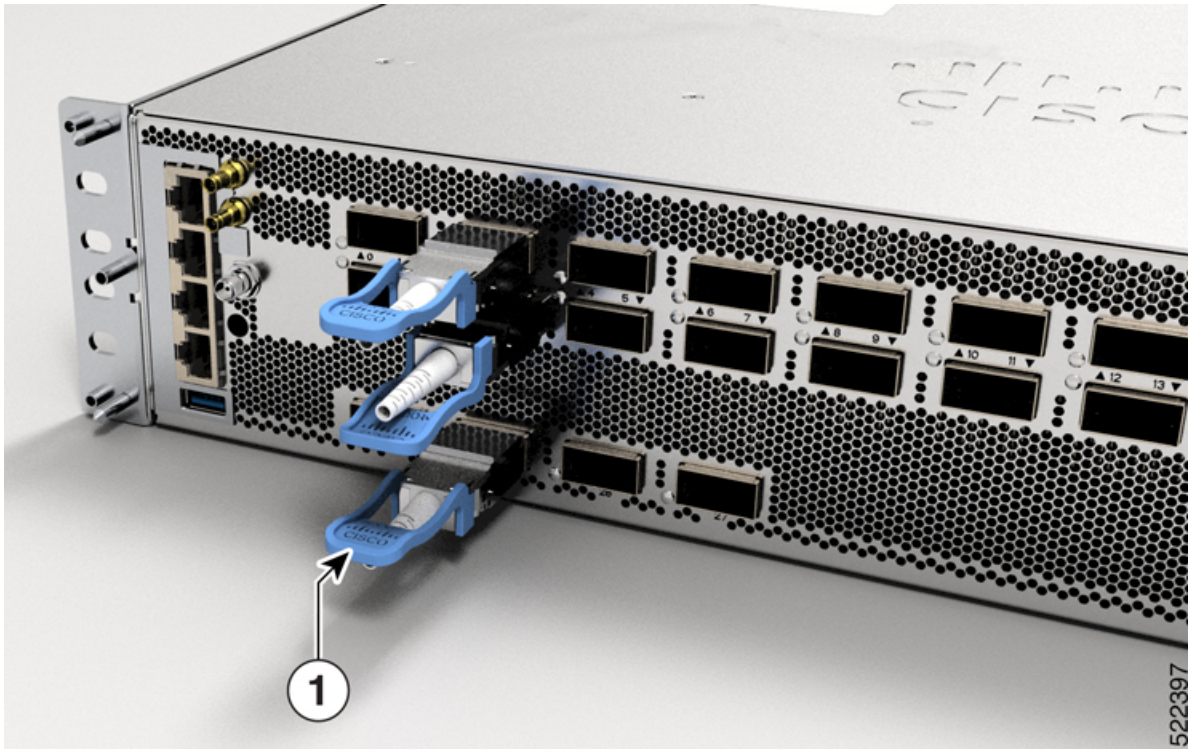
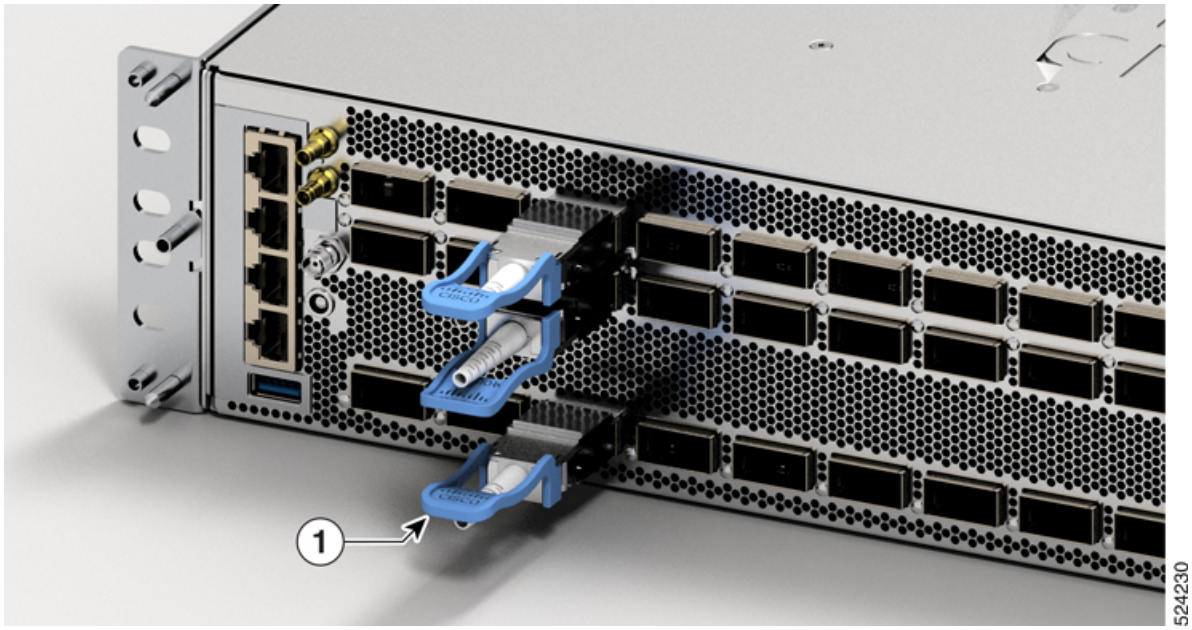


Figure 82: Removing the QSFP Transceiver Module from Cisco 8212-48FH-M Router



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

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 with other devices for network connectivity.

Connect a Fiber-Optic Port to the Network

40G, 100G, 2x100G, or 400G transceivers are supported on Cisco 8200 series routers.Some transceivers work with fiber-optic cables that you attach to the transceivers and other transceivers work with pre-attached copper cables. You must install a transceiver in the port before installing the fiber-optic cable in the transceiver.

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

Disconnect Optical Ports from the Network

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

Maintain Transceivers and Optical Cables

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

Verify Chassis Installation

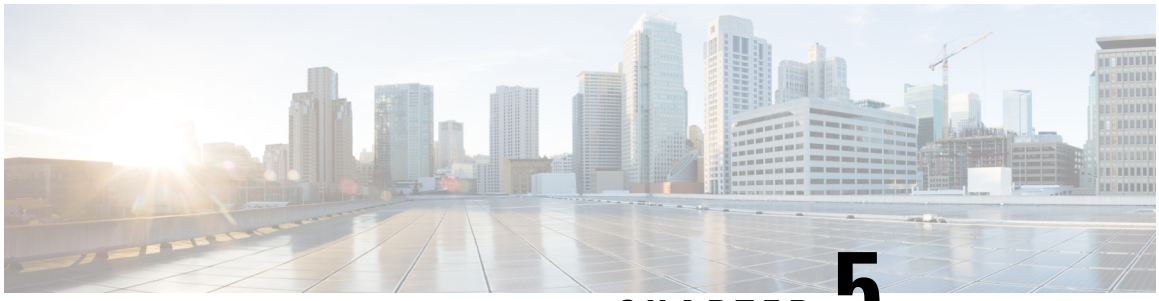
After installing the chassis, use the following **show** commands to verify the installation and configuration in the EXEC mode.If you detect any issues, take corrective action before making further configurations.

Command	Description
show platform	Displays the operational status of the node.
show inventory	Displays information about the field replaceable units (FRUs), including product IDs, serial numbers, and version IDs.
show environment	Displays all the environment-related router information.

Command	Description

show environment temperature	Displays temperature readings from the various sensors on the router. Each system controller has temperature sensors with two thresholds:
	• Minor temperature threshold – When a minor threshold is exceeded, a minor alarm occurs and the following actions occur for all temperature thresholds:
	  • displays system messages
	  • sends SNMP notifications (if configured)
	  • log environmental alarm event that can be reviewed by running the **show alarms** command. Users can use the **show alarms brief system active** command to verify active alarms in the system.
	• Major temperature threshold – When a major threshold is exceeded, a major alarm occurs and the following actions occur:
	  • displays system messages
	  • sends SNMP notifications (if configured)
	  • log environmental alarm event that can be reviewed by running the **show alarms** command. Users can use the **show alarms brief system active** command to verify active alarms in the system.
	• Critical temperature threshold – When a critical threshold is exceeded, a critical alarm occurs and the following actions occur:
	  • displays system messages.
	  • sends SNMP notifications (if configured).
	  • logs environmental alarm event that can be reviewed by running the **show alarms** command. Users can use the **show alarms brief system active** command to verify active alarms in the system.
	  • triggers a chassis shutdown.

show environment power	Displays power usage information for entire router.
show environment voltage	Displays voltage for entire router.
show environment current	Displays current reading from various sensors.
show environment fan	Displays status of fan trays.
show media	Displays media information of the node.



CHAPTER 5

Replace Chassis Components

- Replace the Latched Fan Modules, on page 91
- Replace Fan Modules for Cisco 8202 Router, on page 95
- Replace Fan Modules for Cisco 8202-32FH-M Router or Cisco 8212-48FH-M Router, on page 96
- Remove SSD Card, on page 98
- Replace AC, HVAC, or HVDC Power Supply, on page 99
- Replace Low Voltage DC Power Supply, on page 103
- DIMM Upgrade Procedure, on page 107

Replace the Latched Fan Modules

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.

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

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

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.

This procedure is applicable for Cisco 8201, Cisco 8201-32FH, and Cisco 8201-24H8FH routers.

Table 11: Supported Fan Modules

Router	Fan Module	PID
Cisco 8201	Port-side intake airflow	FAN-1RU-PI
	Port-side exhaust airflow	FAN-1RU-PE

Router	Fan Module	PID
Cisco 8201-32FH and Cisco 8201-24H8FH	Port-side intake airflow	FAN-1RU-PI-V2
	Port-side exhaust airflow	FAN-1RU-PE-V2



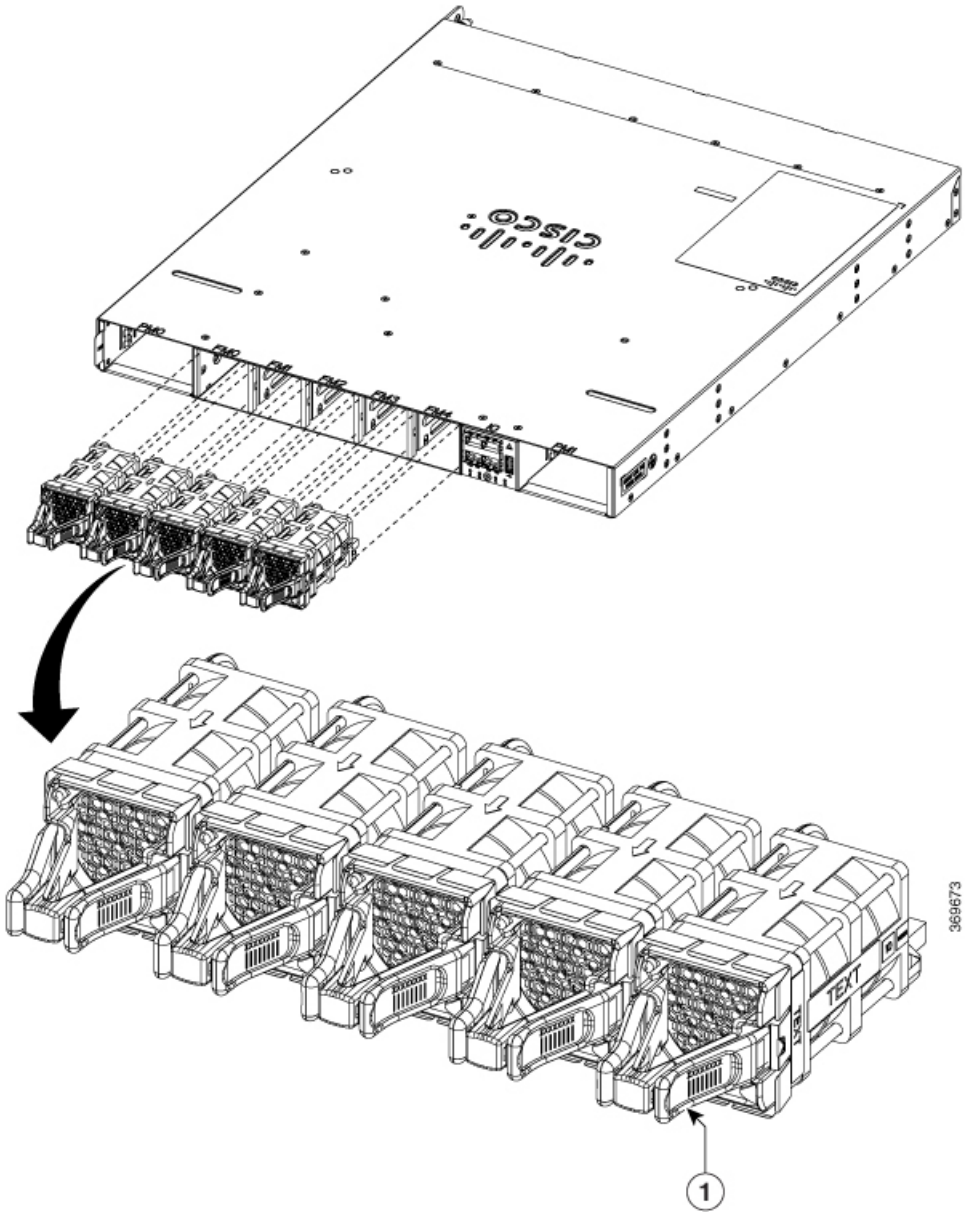
Note The airflow direction must be the same for all power supply and fan modules in the chassis.

Procedure

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

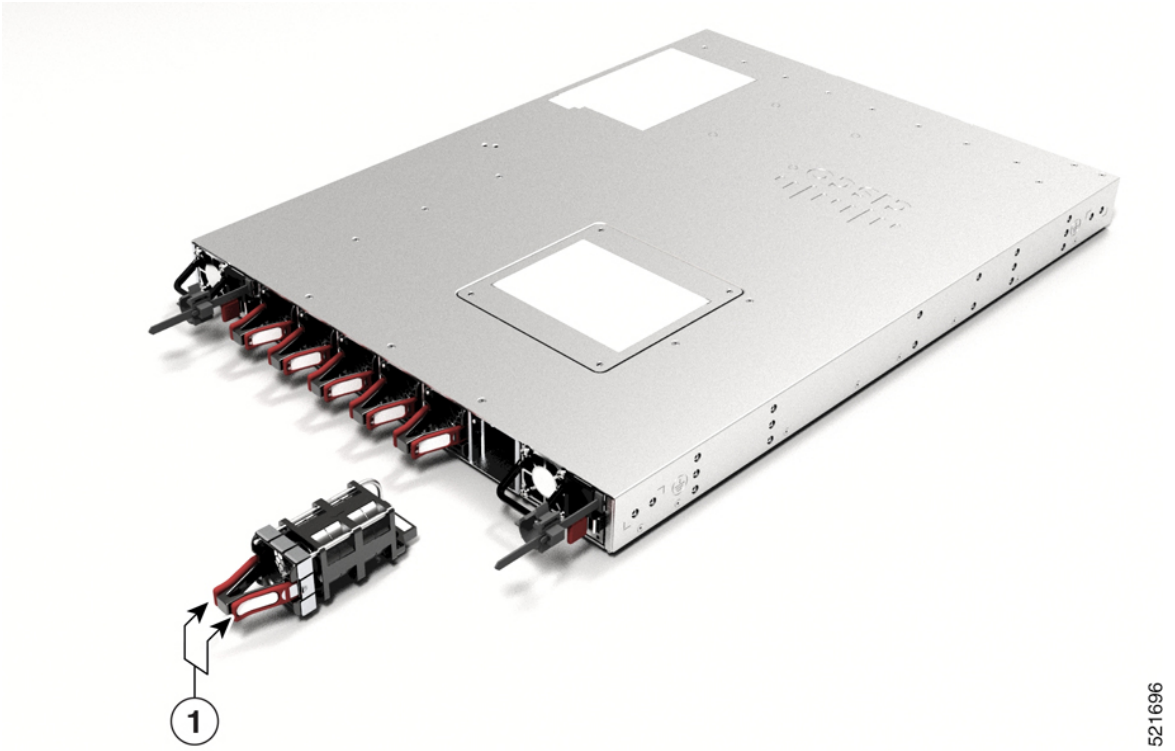
a) Press two latches on the fan module and grasp the handle of fan module.

Figure 83: Cisco 8201 Router — Remove Fans



1	Latched fan module

Figure 84: Cisco 8201-32FH and Cisco 8201-24H8FH Routers — Remove Fans



1	Latched fan module

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 is 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 Fan Modules for Cisco 8202 Router

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.

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

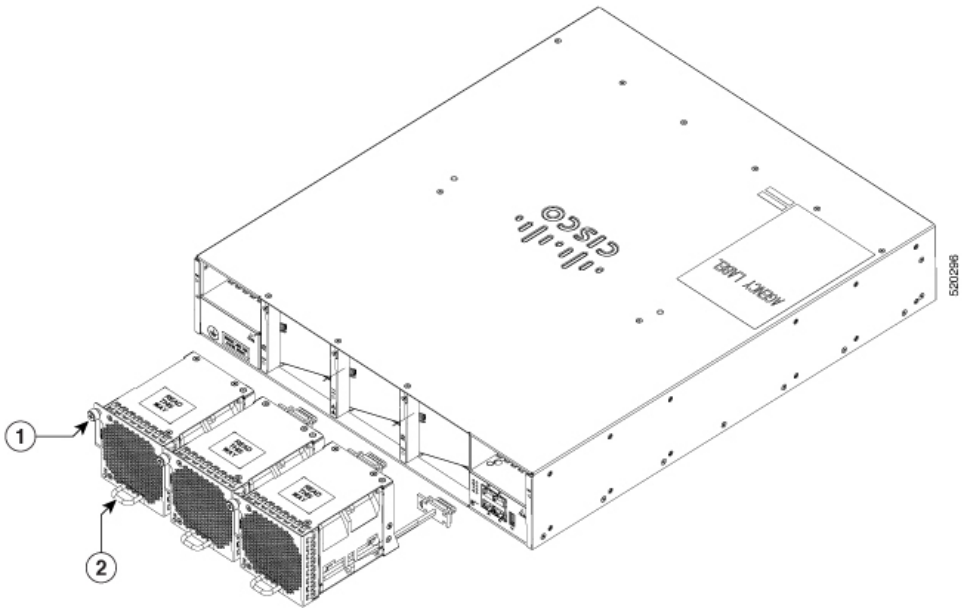
Table 12: Supported Fan Module

Fan Module	PID
Port-side intake airflow	FAN-2RU-PI
Port-side exhaust airflow	FAN-2RU-PE

Procedure

Step 1 Unscrew the thumbscrew on the fan.

Figure 85: Remove Cisco 8202 Fan Modules



Step 2 Pull the handle to remove the fan to be replaced.

Step 3 Hold the fan module with the LED and PID label at the top.

Step 4 Align the fan module to the open fan slot in the chassis and press the module all the way into the slot until the front of the fan module touches the chassis.

Make sure that the thumbscrew on the fan module is aligned with the screw hole in the chassis.

Step 5 Tighten the thumbscrew to secure the fan module in the chassis.

Step 6 If the chassis is powered on, listen for the fans. You should immediately hear them operating. If you do not hear them, ensure that the fan module is inserted completely in the chassis.

Step 7 Verify that the fan module LED is 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 Fan Modules for Cisco 8202-32FH-M Router or Cisco 8212-48FH-M Router

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.



Important

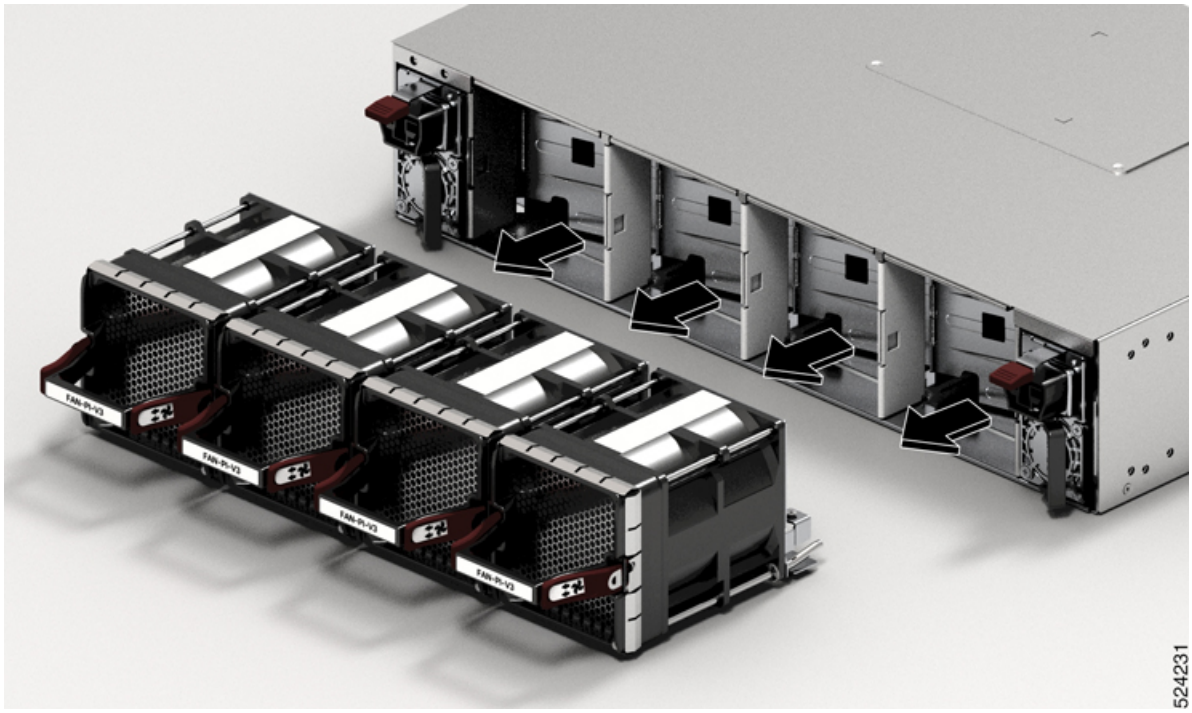
- The airflow direction must be the same for all power supply and fan modules in the chassis.
- The Cisco 8202-32FH-M routers support FAN-PI-V3 (port-side intake airflow) and FAN-PE-V3 (port-side exhaust airflow) fan modules.
- The Cisco 8212-48FH-M routers support FAN-PI-V3 (port-side intake airflow) fan modules.
- The router uses four fan modules, but it can operate with three fan modules while you replace one. When you remove one fan module, the other fan modules speed up their fans to maintain the designed airflow.
- The router will continue to function if a single fan module has failed. We recommend that you leave a failed fan module installed until you can replace it.
- To ensure adequate airflow and prevent overheating, do not operate the router with three fan trays for more than 15 minutes.

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 86: Remove Cisco 8202-32FH -M or Cisco 8212-48FH -M Fan Modules



1	Latched fan module

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 LED at the bottom right. The fan module PID on the handle can be read directly.

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.

Caution
Insert the fan module into the chassis only in the specified orientation. Incorrect orientation and insertion may damage the chassis or the fan module. If the fan module does not fully insert into the slot, do not force it. Remove the fan module and verify that it is the correct type for your router and properly oriented.

Note
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.

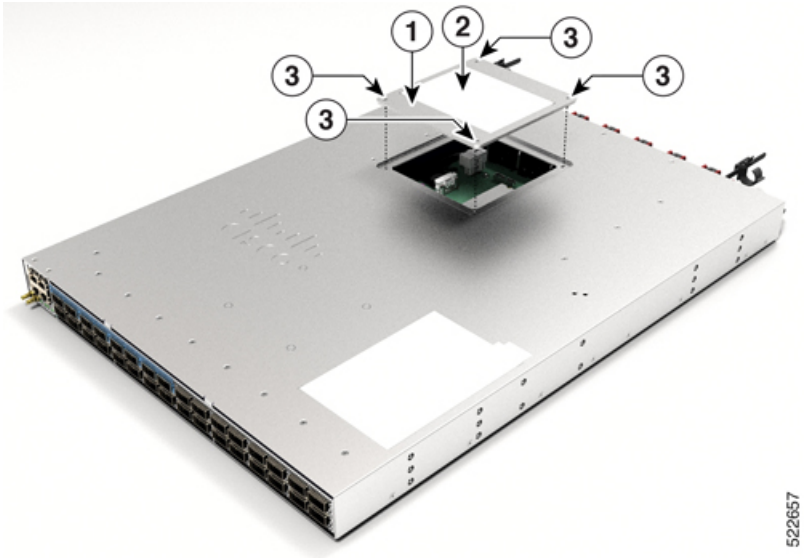
d) Verify that the fan module LED is green. If the LED is not green, one or more fans are faulty. If this situation occurs, contact your customer service representative for replacement parts.

Remove SSD Card

The Cisco 8201-24H8FH Router comes with a M.2 Solid State Drive (SSD) card. We recommend you remove the SSD card before shipping the hardware for a Return Merchandise Authorization (RMA) request. Removal of the card enforces customer data security while performing an RMA.

You can access the card by removing the four screws from the access panel on the top of the router.

Figure 87: Replace or Remove the SSD Card



1	Access panel
2	Instruction label
3	Screws (x4)

To remove the card, follow the card removal instructions on the access panel label.

Figure 88: Card Removal Instruction Label



Replace AC, HVAC, or HVDC Power Supply

This procedure below applies to the following power supply units (PSUs):

- PSU1.4KW-ACPI/PE
- PSU2KW-ACPI/PE
- PSU2KW-HVPI
- PSU3KW-HVPI

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. Duration to replace the PSU at ambient room temperature (23-degree C to 27-degree C) is within 5 minutes.

Note When installing or replacing power supplies, ensure that input voltage and power supply capacity remain the same for both the power supplies. If changing to a different power supply capacity (that is, 2KW to 3KW) or input type (AC to DC), the system must be powered down, and both power supplies must be replaced while the system is still powered down.

To replace a single PSU (for example, due to PSU failure), follow the procedure below.

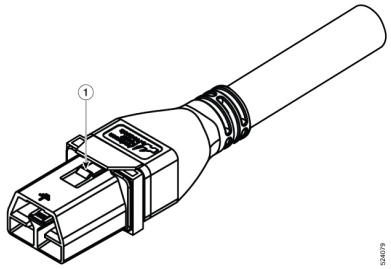
To replace both PSUs (for example, to change type or output of PSU), disconnect power from both PSUs and follow the procedure below.

Procedure

Step 1 Disconnect the power cord of the PSU that must be replaced.

If you use the Saf-D-Grid power cord, then press the latch before pulling the power cord out from the power supply.

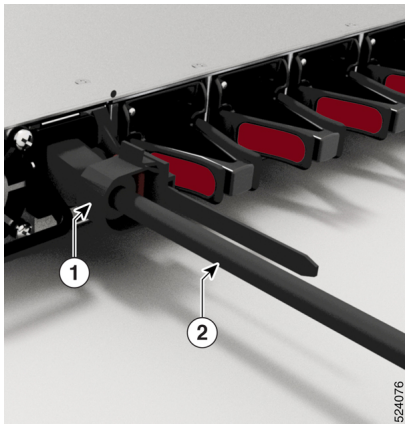
Figure 89: Latch on Saf-D-Grid Power Cord



1	Latch

Note
In case of an AC PSU, remove the power cord retention clamp from the AC PSU before disconnecting the AC power cord.

Figure 90: Disconnect AC Power Cable



1	Power cord retention clamp	2	AC power cable

Step 2 Press the tab inward to unlatch the PSU, and pull the handle to remove the PSU.

Figure 91: Cisco 8202 Router — Remove Power Supply

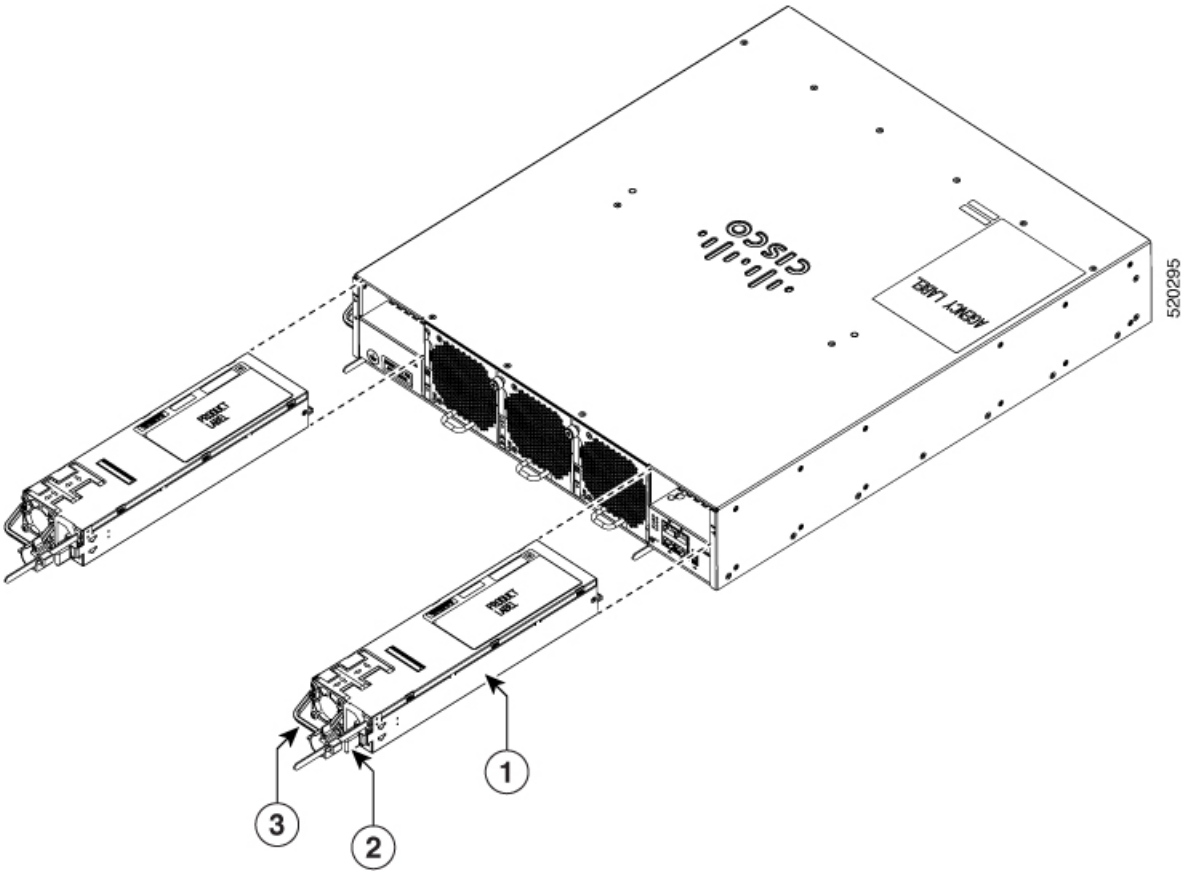


Figure 92: Cisco 8201-32FH and Cisco 8201-24H8FH Routers — Remove Power Supply

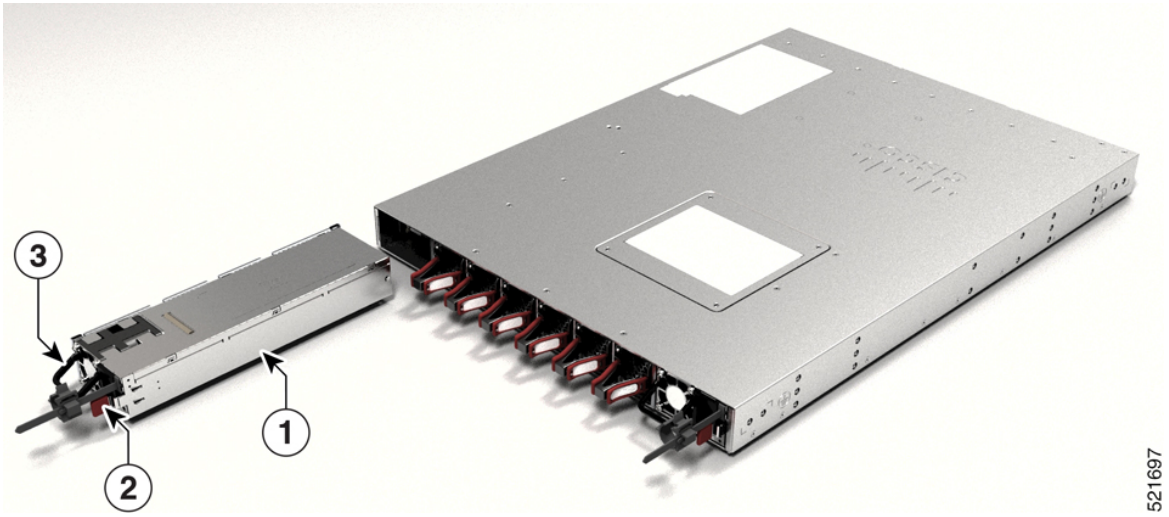


Figure 93: Cisco 8202-32FH -M Router — Remove Power Supply

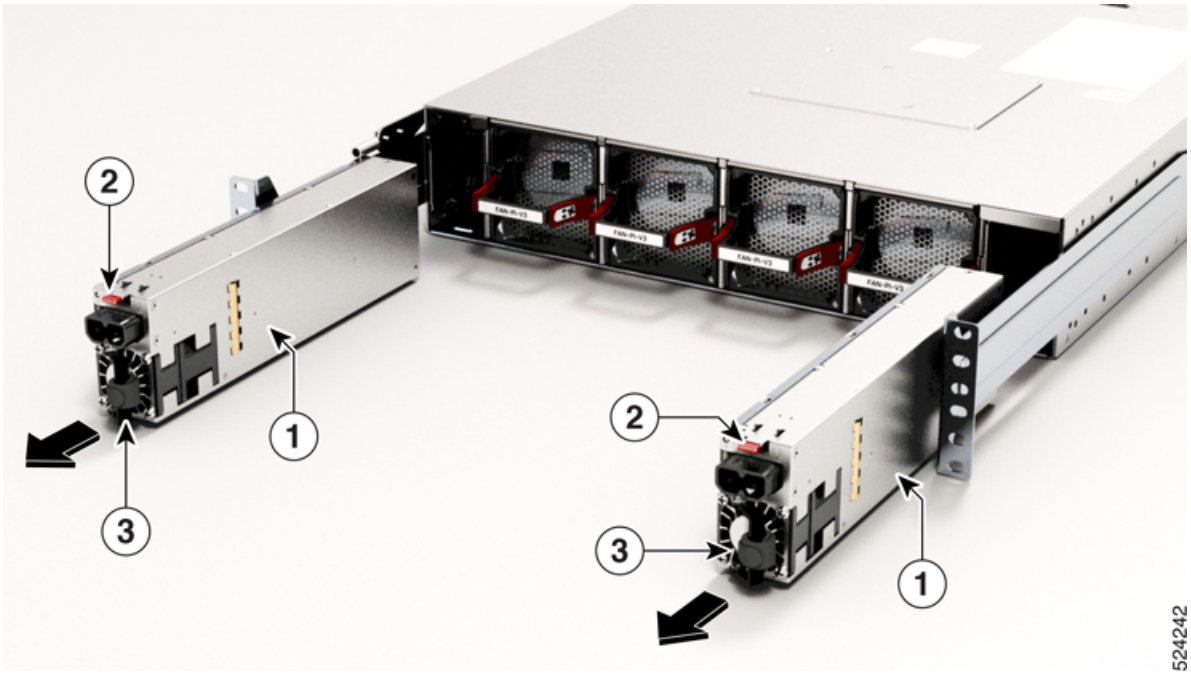
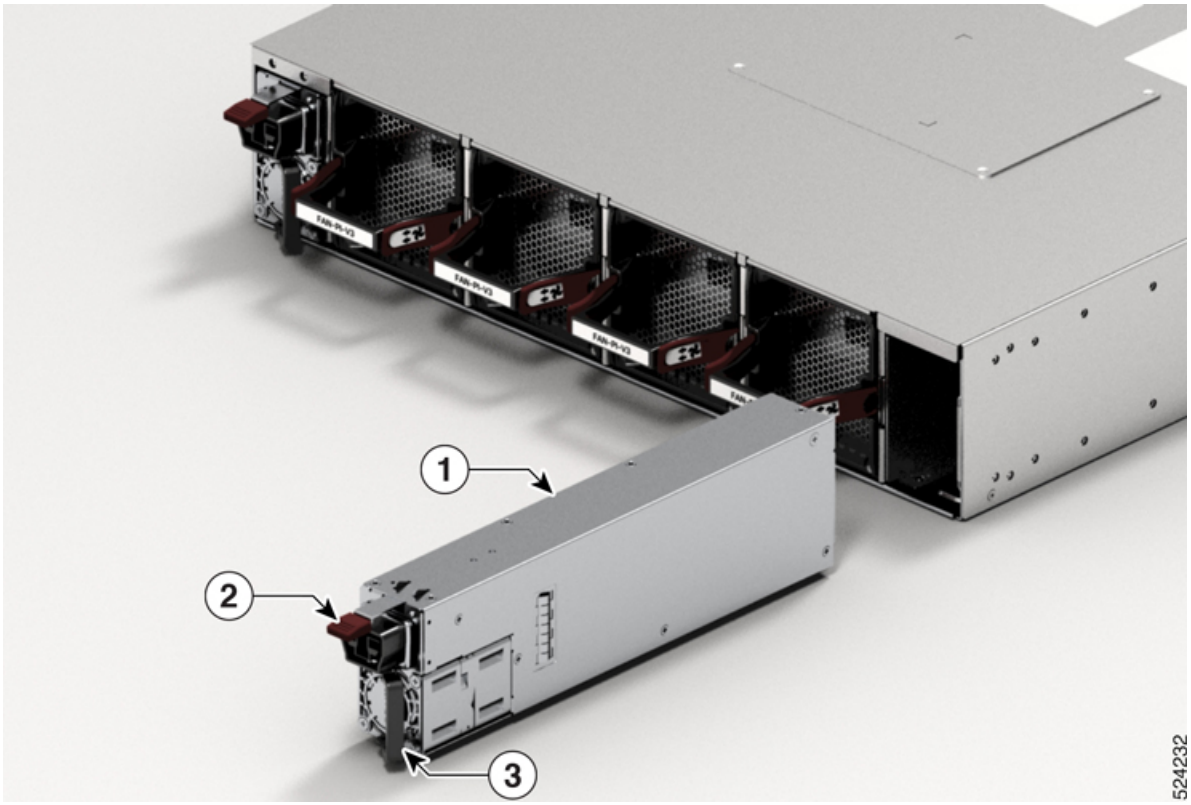


Figure 94: Cisco 8212-48FH -M Router — Remove Power Supply



1	PSU	3	Handle
2	Tab		

Step 3 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 4 Connect the power cord to the PSU. Ensure that the power cord is completely fixed.

Note
For an AC PSU that has an IEC connector (example, 2KW PSU), fix the power cord retention clamp to the power supply.

For an AC/HVDC PSU (example, 3KW PSU) that has Saf-D-Grid power cord, ensure that power cord is latched.

Step 5 Turn on the power at source.

Step 6 Wait till the PSU LED color turns green. Verify the power using the **show environment power** command after the router boots up.

Replace Low Voltage DC Power Supply

This procedure below applies to the following power supply units:

- PSU2KW-DCPI/PE- This PSU has 2-pin connector cable.
- PSU3KW-DCPI- This PSU has 2-hole lug cables.
- PSU3KW-DCPI-ORV3- This PSU has 6-pin connector cable.

Note When installing or replacing power supplies, ensure that input voltage and power supply capacity remain the same for both the power supplies. If changing to a different power supply capacity (that is, 2KW to 3KW) or input type (AC to DC), the system must be powered down, and both power supplies must be replaced while the system is still powered down.

To replace a single PSU (for example, due to PSU failure), follow the procedure below.

To replace both PSUs (for example, to change type or output of PSU), disconnect power from both PSUs and follow the procedure below.

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. Duration to replace the PSU at ambient room temperature (23-degree C to 27-degree C) is within 5 minutes.

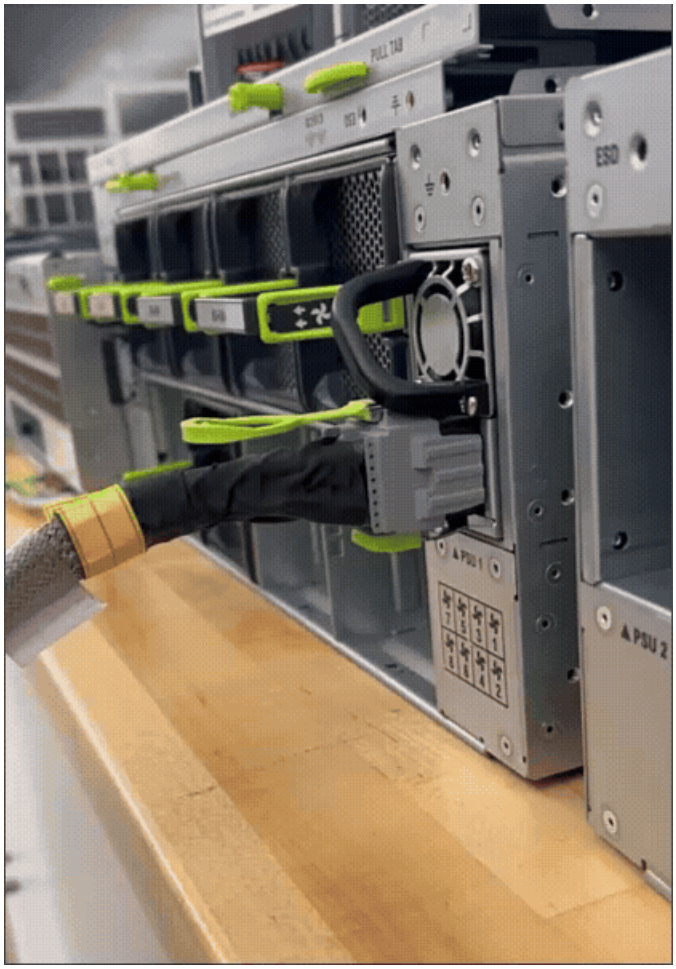
Procedure

Step 1 Disconnect the power cable of the PSU that must be replaced.

In case of PSU2KW-DCPI/PE PSU, press the latch before pulling the power cord out from the PSU.

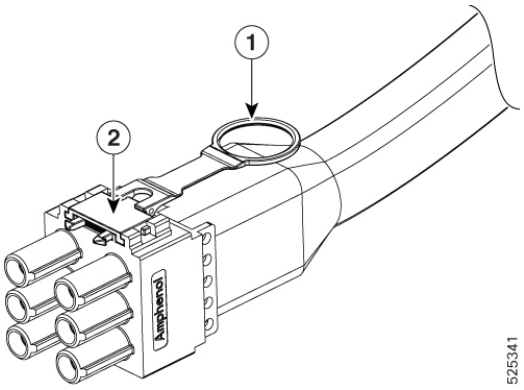
For the PSU3KW-DCPI-ORV3 power supply unit, use the pull-tab to release the cable latch and then, while holding both the pull-tab and the cable connector body, gently pull to disconnect the cable from the PSU.

Figure 95: Remove the Cable from PSU3KW-DCPI-ORV3



Caution
Pulling the cable out of the PSU or removing the PSU from the router by using only the pull-tab may cause the pull-tab to break.

Figure 96: Remove the Cable from PSU3KW-DCPI-ORV3



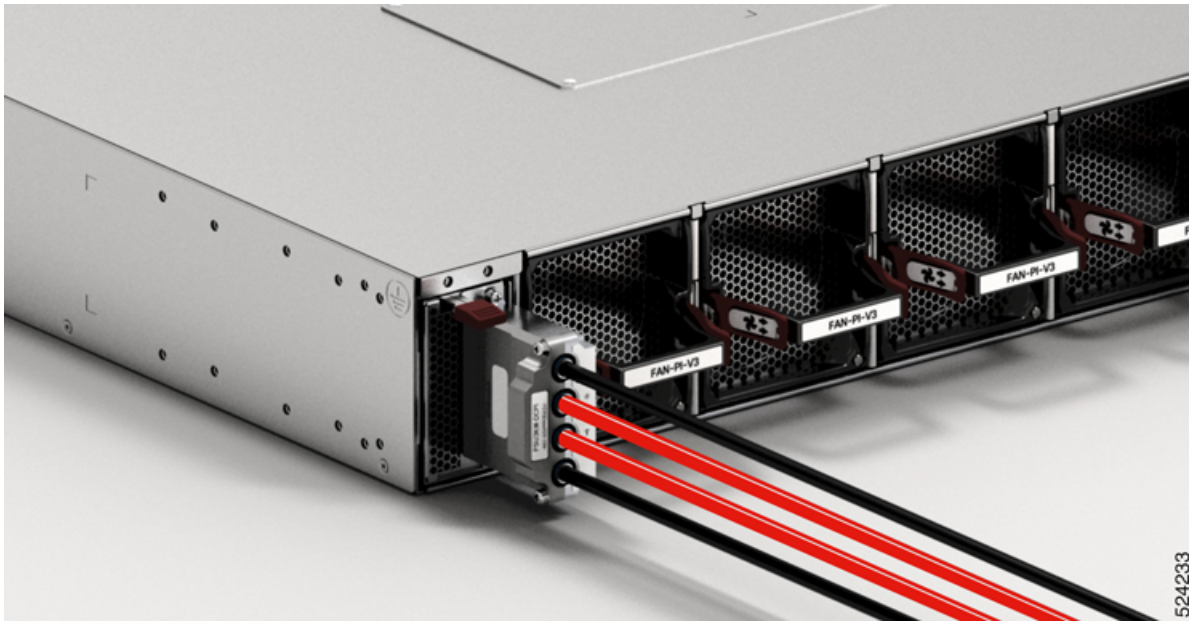
1	Pull-tab	2	Cable latch

In case of PSU3KW-DCPI PSU, to remove the low voltage DC power cable from the PSU that has lug holes:

a. Turn off the DC branch circuit breaker.

b. Open the DC terminal block cover.

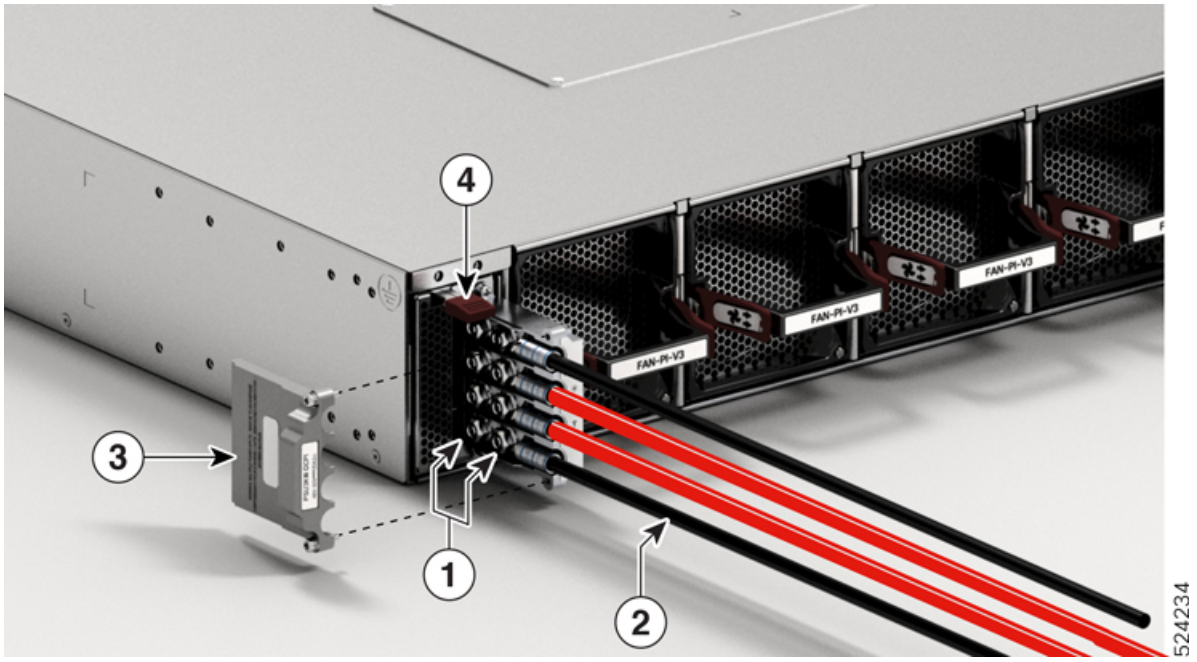
Figure 97: Open the DC terminal block cover



1	Terminal block cover	2	Screws

c. Unscrew the 2-hole lug nuts and pull the DC power cables out.

Figure 98: Remove the DC power cables



1	2-hole lug nuts	3	Terminal block cover
2	DC power cables	4	Tab

Step 2 Press the tab inward to unlatch the PSUand pull the PSU.

Step 3 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 4 Connect the PSU cable.

In case of PSU2KW-DCPI/PE PSU and PSU3KW-DCPI-ORV3, insert the power cord into the PSU.

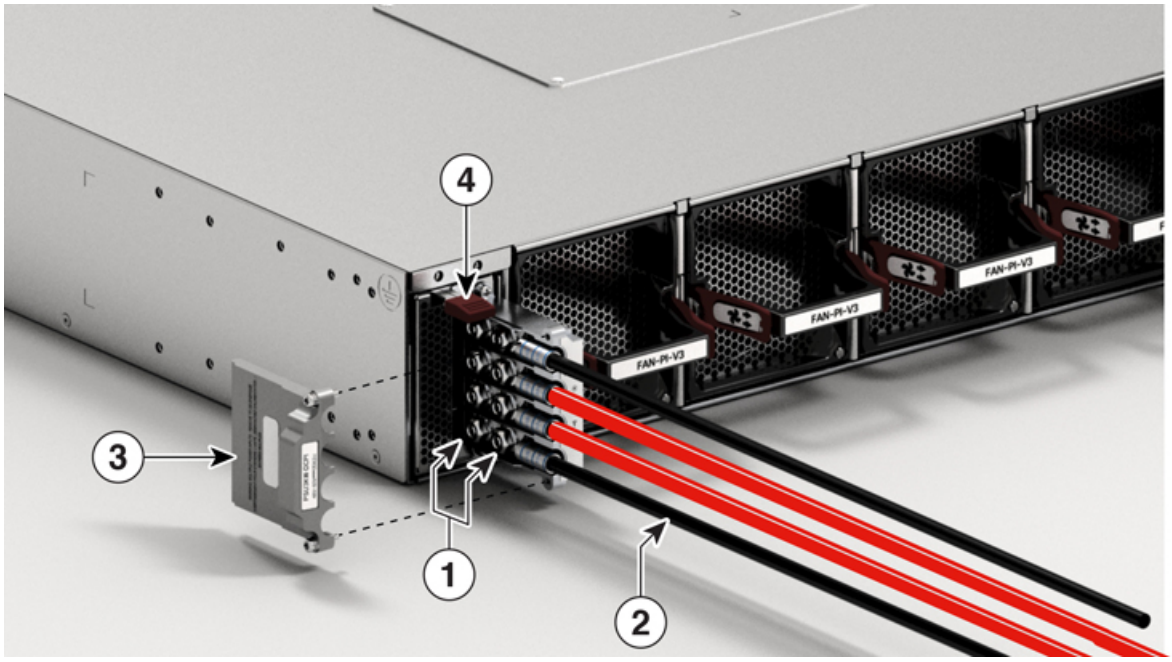
In case of PSU3KW-DCPI PSU, to connect the cable to the PSU that has lug holes:

a. Open the DC terminal block cover.

b. Connect red DC power cables to A+ and B+ terminals and black DC power cables to A- and B- terminals.

c. Tighten the 2-hole lug nuts to a torque value of 20 in-lb.

Figure 99: Connect the DC power cables



1	2-hole lug nuts	3	Terminal block cover
2	DC power cables	4	Tab

d. Close the DC terminal block cover. Tighten the cover screws to a torque value of 5 in-lb.

Step 5 Turn on the power at source.

Step 6 Wait till the PSU LED color turns green. Verify the power using the **show environment power** command after the router boots up.

DIMM Upgrade Procedure

Earlier versions of the Cisco 8202-32FH-M router were shipped with 32GB of memory. Newer versions are shipped with 64GB of memory. You can upgrade the router from 32GB to 64GB using memory upgrade PID DIMM-64G=.

Verifying the Hardware Version and Memory Configuration

To verify the current hardware version, use the **show diag details location 0/RP0/CPU0** command.

In the examples below, the Version Identifier and Deviation #1 fields indicate the installed memory:

Version Identifier	Deviation #1	Installed Memory	Upgrade Available
V03 and later	—	64 GB	No

Version Identifier	Deviation #1	Installed Memory	Upgrade Available
V02	584161	64 GB	No
V02 and earlier	0	32 GB	Yes

The below example shows Version Identifier as V02 and Deviation #1 as 0, indicating that there is 32GB of memory installed. Proceed with the memory upgrade procedure.

```
RP/0/RP0/CPU0:ios# show diag details location 0/RP0/CPU0

0/RP0/CPU0-Base Board IDPROM - Cisco 8200 2RU 32x400G QSFP56-DD w/IOS XR HBM MACsec
Info
    Controller Family          : 0045
    Controller Type            : 0647
    PID                        : 8202-32FH-M
    Version Identifier         : V02
    UDI Description            : Cisco 8200 2RU 32x400G QSFP56-DD w/IOS XR HBM MACsec
    Chassis Serial Number      : FLM27040B1Z
    Top Assy. Part Number      : 68-7442-03
    Top Assy. Revision         : C0
    PCB Serial Number          : FLM27010309
    PCA Number                 : 73-20590-01
    PCA Revision               : C0
    CLEI Code                  : CMMX800ARB
    ECI Number                 : 477603
    Deviation Number # 1       : 0
    Deviation Number # 2       : 0
    Deviation Number # 3       : 0
    Deviation Number # 4       : 0
    Deviation Number # 5       : 0
    Manufacturing Test Data    : 00 00 00 00 00 00 00 00
    Calibration Data           : 00000000
    Chassis MAC Address        : 9c54.1644.1600
    MAC Addr. Block Size       : 512
    Hardware Revision          : 1.0
    Device values # 1          : 42 00 00 00 00 00 00 00
```

The below example shows Version Identifier as V02 and Deviation #1 as 584161, indicating that there is 64GB of memory installed. No memory upgrade is required.

```
RP/0/RP0/CPU0:ios# show diag details location 0/RP0/CPU0

0/RP0/CPU0-Base Board IDPROM - Cisco 8200 2RU 32x400G QSFP56-DD w/IOS XR HBM MACsec
Info
    Controller Family          : 0045
    Controller Type            : 0647
    PID                        : 8202-32FH-M
    Version Identifier         : V02
    UDI Description            : Cisco 8200 2RU 32x400G QSFP56-DD w/IOS XR HBM MACsec
    Chassis Serial Number      : FLM27040B1Z
    Top Assy. Part Number      : 68-7442-03
    Top Assy. Revision         : C0
    PCB Serial Number          : FLM27010309
    PCA Number                 : 73-20590-01
    PCA Revision               : C0
    CLEI Code                  : CMMX800ARB
    ECI Number                 : 477603
    Deviation Number # 1       : 584161
    Deviation Number # 2       : 0
```

```
Deviation Number # 3       : 0
Deviation Number # 4       : 0
Deviation Number # 5       : 0
Manufacturing Test Data    : 00 00 00 00 00 00 00 00
Calibration Data           : 00000000
Chassis MAC Address        : 9c54.1644.1600
MAC Addr. Block Size       : 512
Hardware Revision          : 1.0
Device values # 1          : 42 00 00 00 00 00 00 00
```

To verify the current memory configuration, use the **show memory summary location 0/RP0/CPU0** command. The following example shows the installed memory as 64GB. No memory upgrade is required.

```
RP/0/RP0/CPU0:ios# show memory summary location 0/RP0/CPU0

node:      node0_RP0_CPU0
------------------------------------------------------------------

 Physical Memory: 63808M total (58196M available)
 Application Memory : 63808M (58196M available)
 Image: 4M (bootram: 0M)
 Reserved: 0M, IOMem: 0M, flashfsys: 0M
 Total shared window: 318M
```

Upgrading the Memory

The Cisco 8202-32FH-M router uses two Dual Inline Memory Modules (DIMMs), one stacked on top of the other. To upgrade the memory, you will remove two 16GB DIMMs and insert two 32GB DIMMs. To access the DIMMs, you must remove the chassis cover.

Caution Use only the memory from the DIMM-64G= upgrade kit. You must install both DIMMs in this upgrade. Do not attempt to install other devices or DIMMs not approved by Cisco in the DIMM sockets.

Before you begin

Note Before proceeding, ensure that you have the proper tools and ESD-prevention equipment available.

Procedure

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

Step 2 Label and remove all interface cables.

Step 3 **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.

Disconnect the power and ground connections.

Step 4 Remove chassis from rack (refer to Rack Mount the Chassis, on page 19).

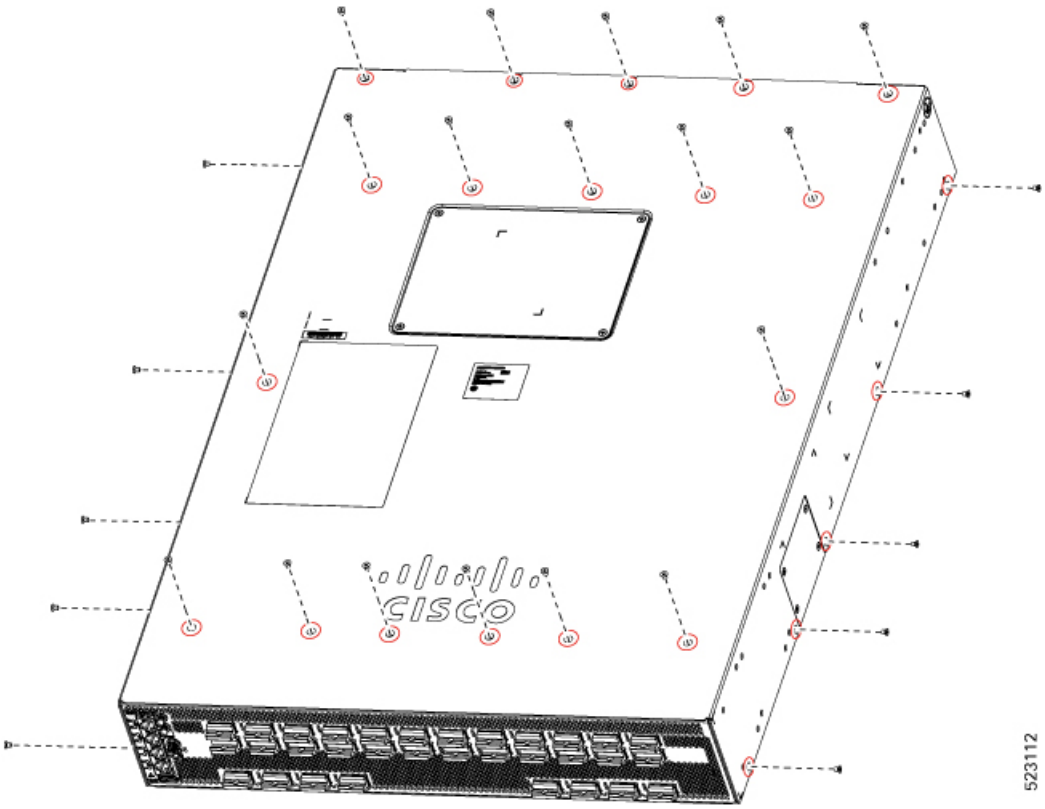
Step 5 Place the router on a flat antistatic surface.

Step 6 **Caution**
Allow at least 15 minutes to allow the chassis and internal components to cool before removing the cover.

Using a T8 Torx screwdriver, remove the 28 screws indicated in the figure below:

- 5 screws along each side
- 18 screws on the top

Figure 100: Removing the Screws and Cover



Step 7 Remove the cover.

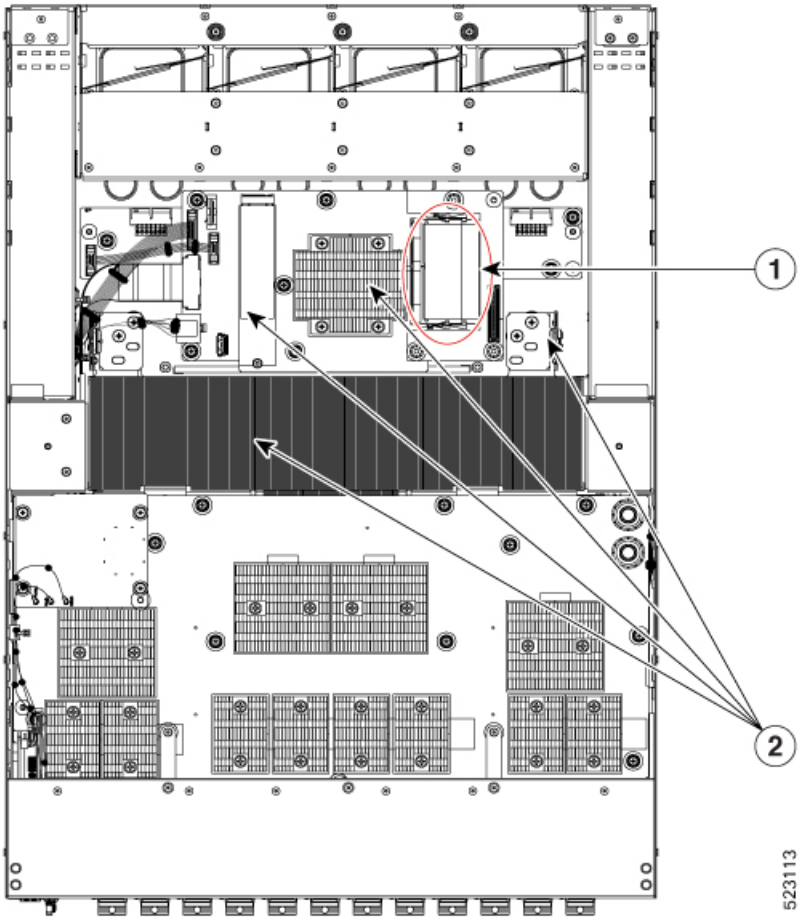
Step 8 **Warning**
Statement 1079—Hot Surface

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



Locate the DIMM sockets on the router. Avoid touching heatsinks, brackets, and cables.

Figure 101: DIMM Socket Location



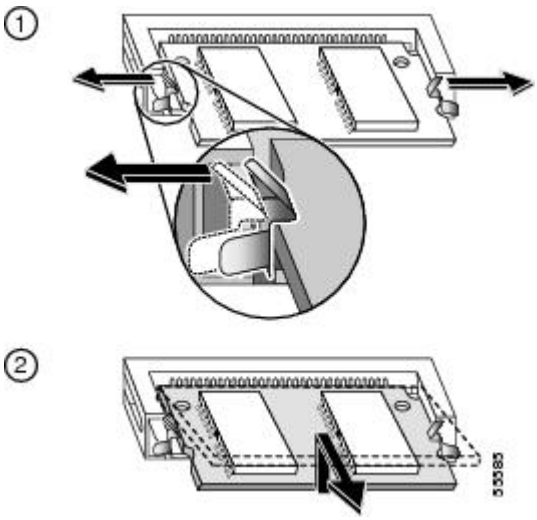
1	DIMM socket location
2	Avoid touching these areas (heatsinks, brackets, cables)

Step 9

Note
The router uses two DIMMs, one stacked on top of the other. Remove the upper DIMM first, then remove the lower DIMM.

Remove the top DIMM from the socket by pulling the locking spring clips on both sides of the DIMM holder outward and tilt the DIMM free of the clips. Be careful not to break the clips on the DIMM connector.

Figure 102: Removing the DIMM



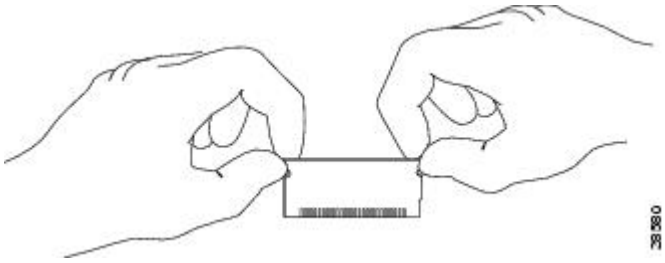
Step 10

Caution

DIMMs are sensitive components that are susceptible to ESD damage. To prevent ESD damage, handle DIMMs by the edges only; avoid touching the memory modules, pins, or traces (the metal fingers along the connector edge of the DIMM).

Hold the DIMM by its edges, gently lift and remove it, and place it on an antistatic mat or foam.

Figure 103: Handling a DIMM



Step 11 Repeat Steps Step 9, on page 111 and Step 10, on page 112 for the bottom DIMM.

Step 12 Remove one upgrade DIMM from the antistatic container.

Step 13 Hold the DIMM by its edges.

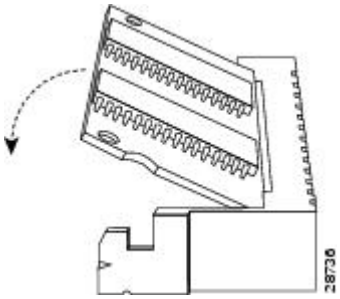
Step 14 Tilt the DIMM to approximately the same angle as the socket and insert the connector edge into lower DIMM socket. Note the notch (key) on the bottom edge of the DIMM. This key assures correct orientation of the DIMM in the socket.

Caution

When inserting the DIMM, use firm but not excessive pressure. If you damage a socket, you will have to return the router to Cisco for repair.

Step 15 Press the DIMM down until it is secured by the spring clips.

Figure 104: Installing the DIMM

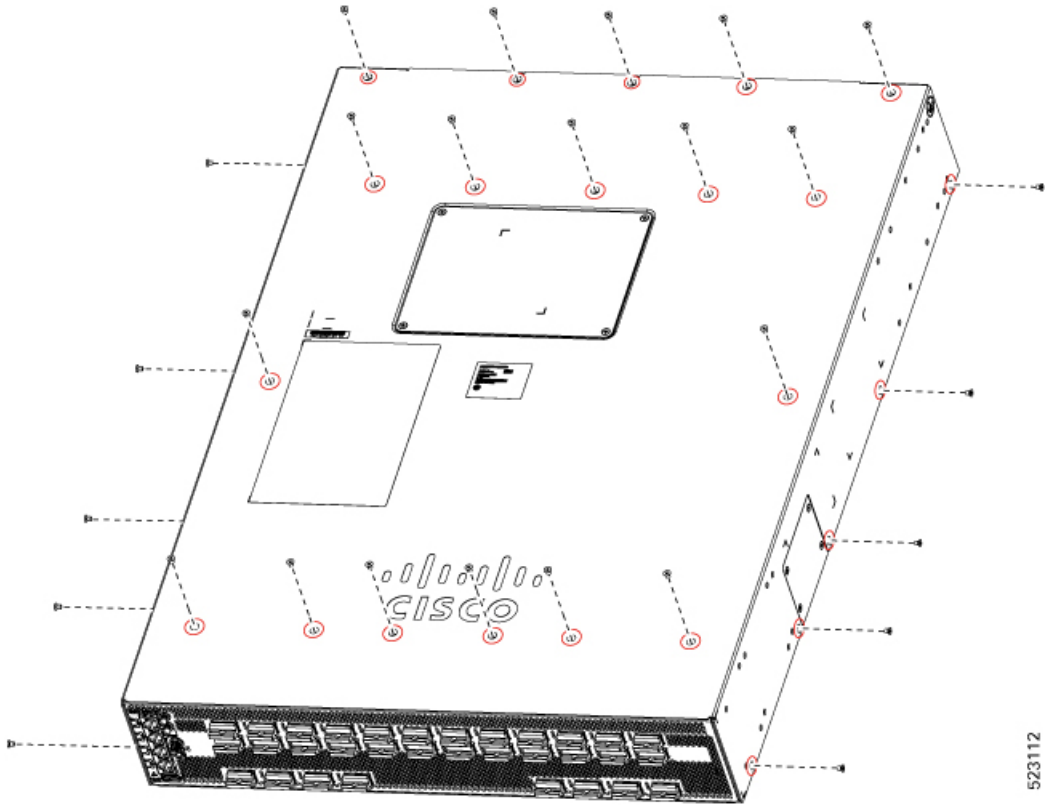


Step 16 When the DIMM is installed, check the two alignment holes, and ensure that the spring retainer is visible. If it is not, the DIMM is not seated properly. If the DIMM appears misaligned, carefully remove it and reseat it in the socket. Push the DIMM firmly back into the socket until the retainer springs snap into place.

Step 17 Repeat Steps Step 12, on page 112 through Step 16, on page 113 for the second (**upper**) DIMM.

Step 18 Install the cover and 28 screws using a T8 Torx screwdriver. Tighten the screws to 5 in-lb (0.56 Nm) of torque.

Figure 105: Installing the Cover and Screws



Step 19 Install the chassis in the rack (refer to Rack Mount the Chassis, on page 19).

Step 20 **Warning**

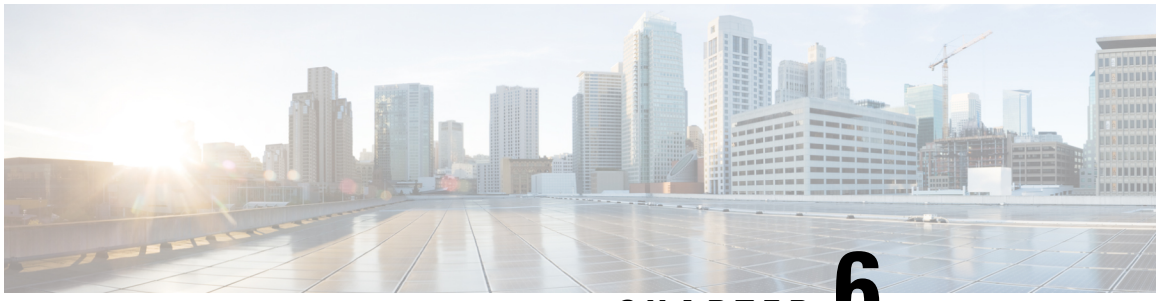
Statement 1046—Installing or Replacing the Unit

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.

Reconnect the ground, power, and interface cables.

Step 21 After the system boots up, use the **show memory summary location 0/RP0/CPU0** command to verify the memory configuration.



CHAPTER 6

LEDs

- Chassis LEDs, on page 115
- Fan Tray LED, on page 119
- Power Supply LEDs, on page 121
- Port Status LEDs, on page 125

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 106: Chassis LEDs - Front View of Cisco 8201 Chassis

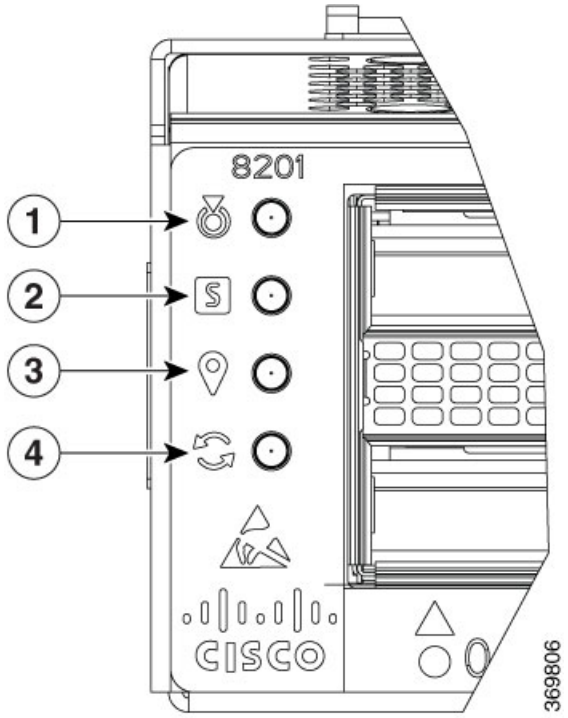


Figure 107: Chassis LEDs - Rear View of Cisco 8201 Chassis

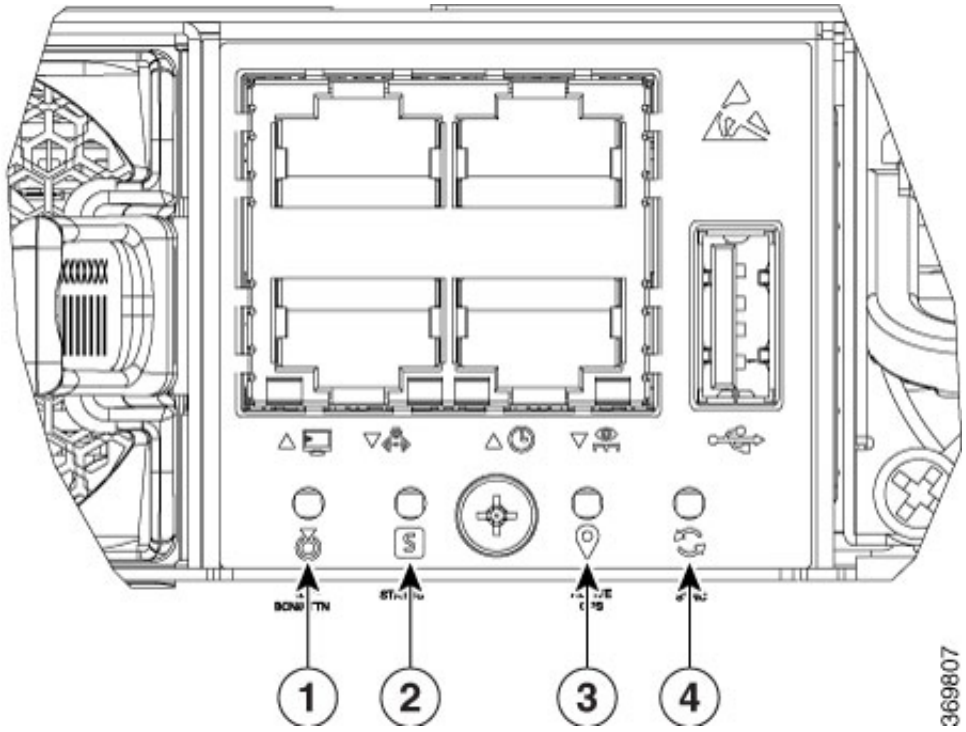


Figure 108: Chassis LEDs - Rear View of Cisco 8202 Chassis

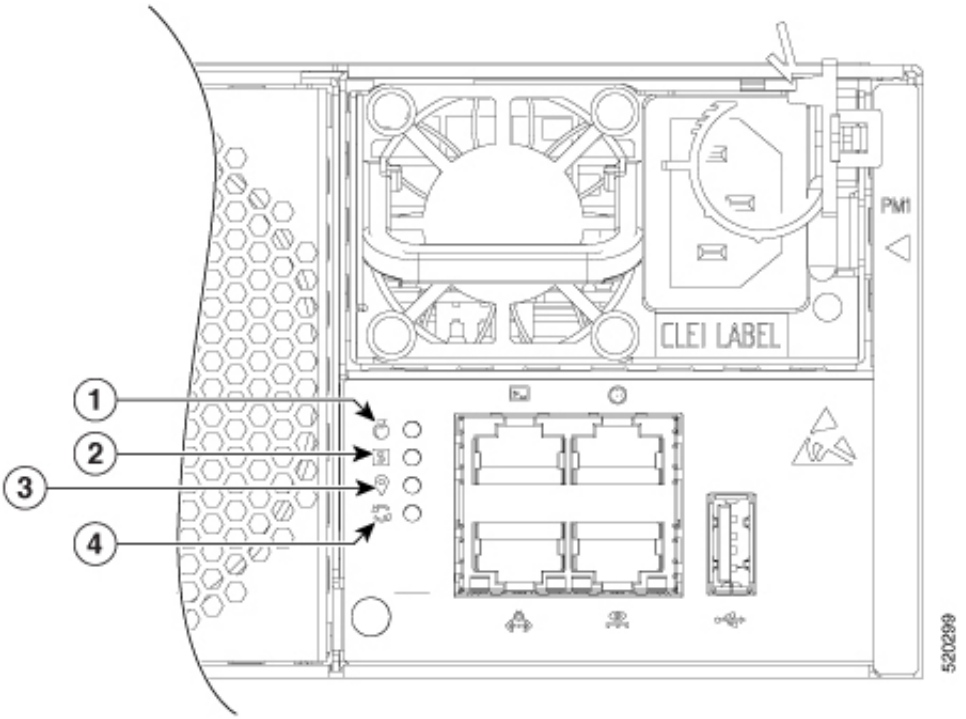


Figure 109: Chassis LEDs - Front View of Cisco 8201-32FH and Cisco 8201-24H8FH Routers

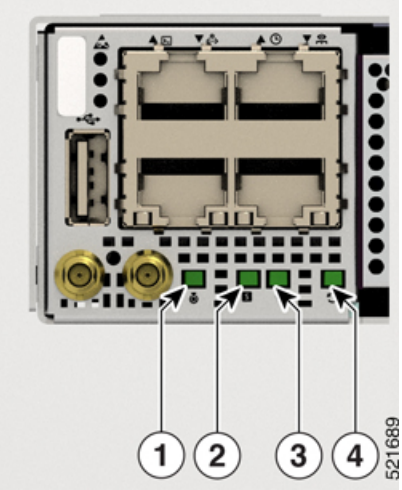


Figure 110: Chassis LEDs - Front View of Cisco 8202-32FH -M Chassis

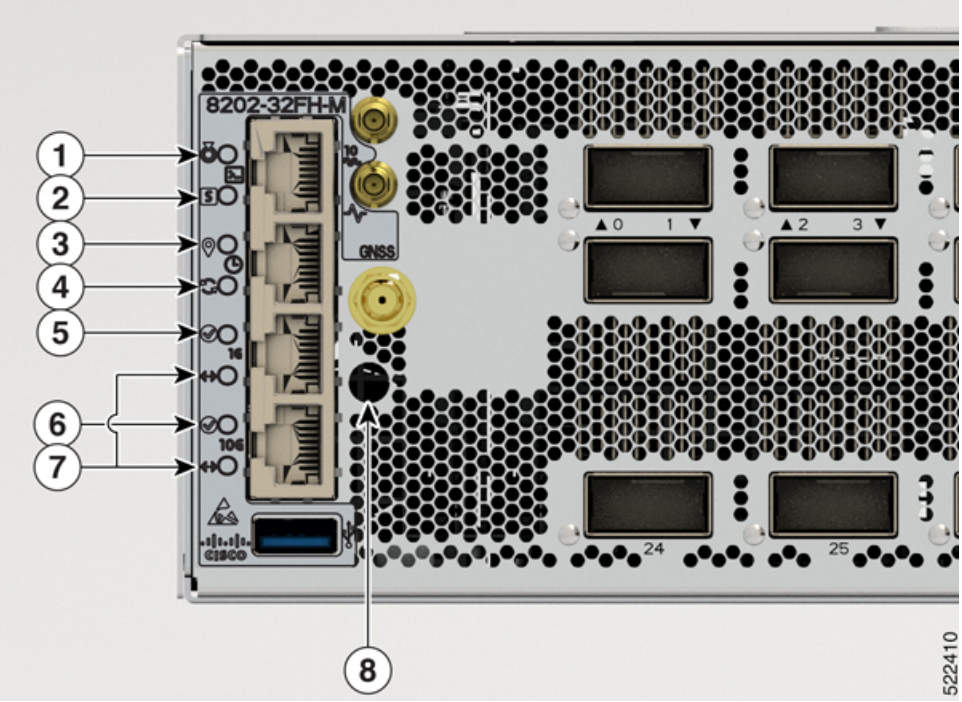
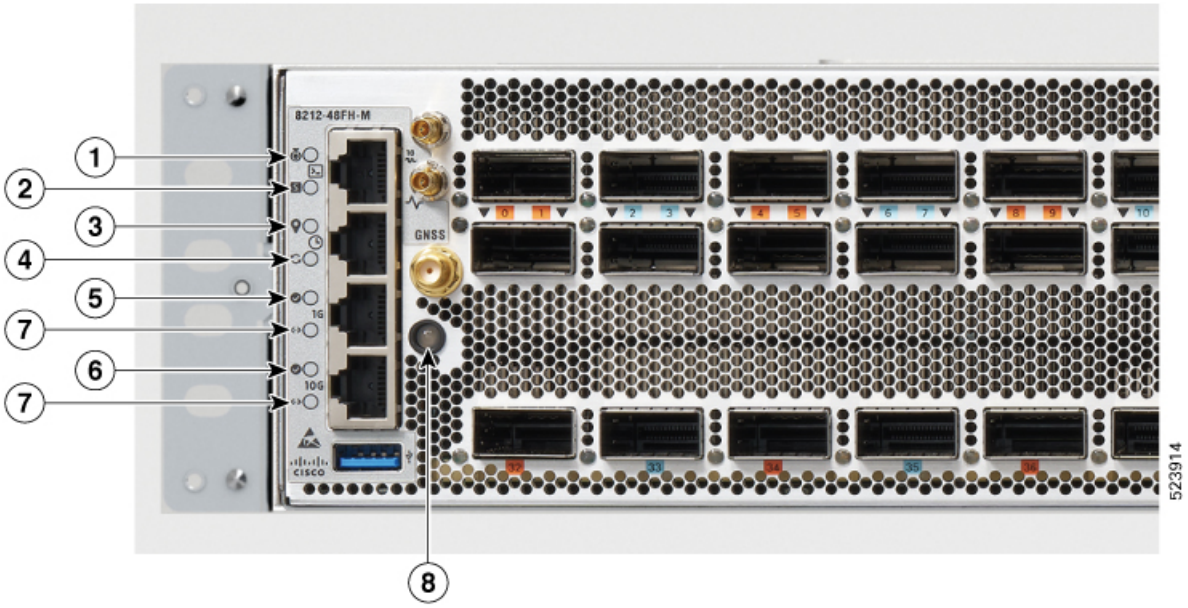


Figure 111: Chassis LEDs - Front View of Cisco 8212-48FH -M Chassis



1	Attention
2	Status
3	GPS
4	Synchronization
5	1G Management Port
6	10G Management Port
7	1G and 10G Port Activity
8	GNSS

Table 13: 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.

LED	Color	Status
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.
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.
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.
Management Port 	Green	The ethernet link is up and operational.
	Amber	The port is either receiving or transmitting data packets.
	Off	The ethernet link is down.
Management Port Activity 	Green	The ethernet link is up and operational.
	Amber	The port is either receiving or transmitting data packets.
	Off	The ethernet link is down.

Fan Tray LED

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

Figure 112: Fan Tray LED - Cisco 8201 Chassis

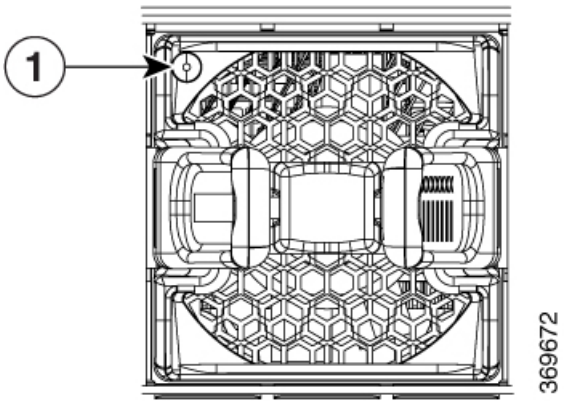


Figure 113: Fan Tray LED - Cisco 8202 Chassis

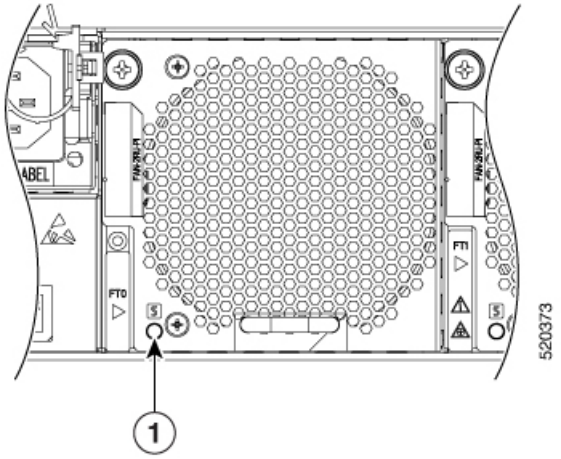


Figure 114: Fan Tray LED - Cisco 8201-32FH and Cisco 8201-24H8FH Routers

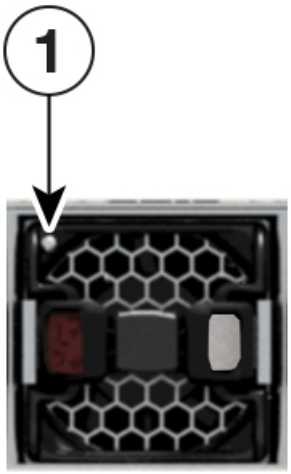
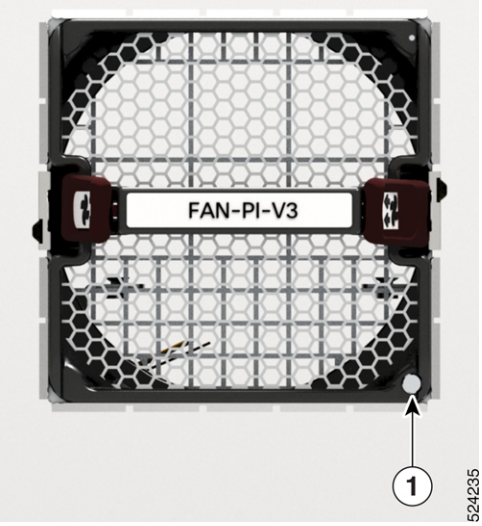


Figure 115: Fan Tray LED - Cisco 8202-32FH-M and Cisco 8212-48FH-M Routers



1	Fan Status LED

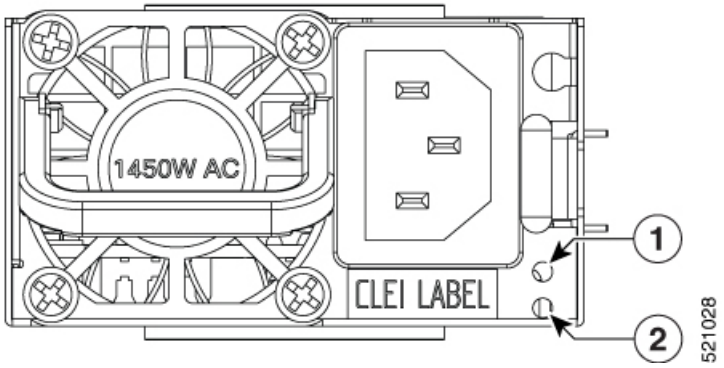
Table 14: Fan Tray LED Descriptions

LED	Color	Status
STATUS	Green	Fan is operating normally.
	Amber	Fan tray is inserted and pending to come online.
	Flashing Amber	Fan has failed.
	Off	Fan is not receiving power.

Power Supply LEDs

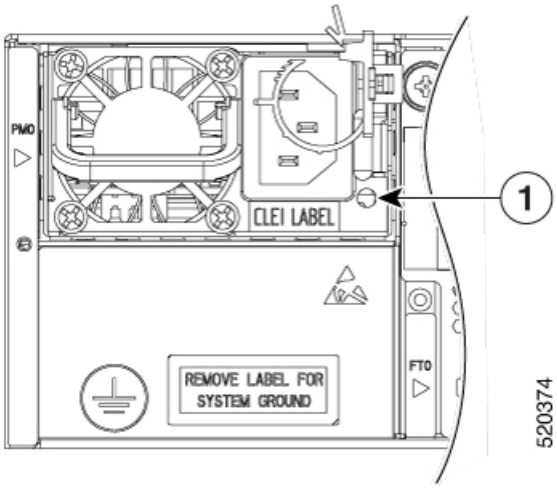
Power modules are located on the back side of the chassis. Each power module has a Status LED.

Figure 116: Power Supply LED - 1450W



1	Status LED
2	Attention LED

Figure 117: Power Supply LED - 2000W



1	Status LED

Figure 118: Power Supply LED - Cisco 8201-32FH and Cisco 8201-24H8FH Routers

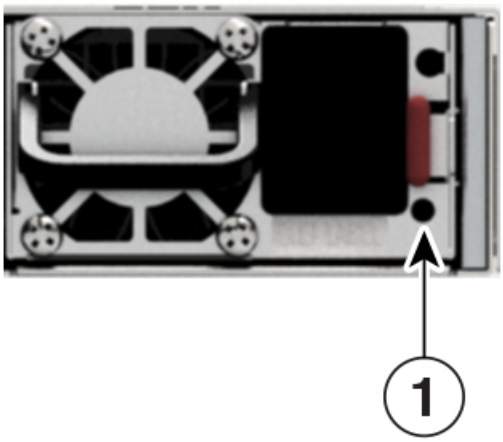


Figure 119: Power Supply LED - Cisco 8202-32FH -M Chassis



Figure 120: Power Supply LED - Cisco 8212-48FH-M Chassis



1	Status LED

Table 15: Power Supply LED Descriptions

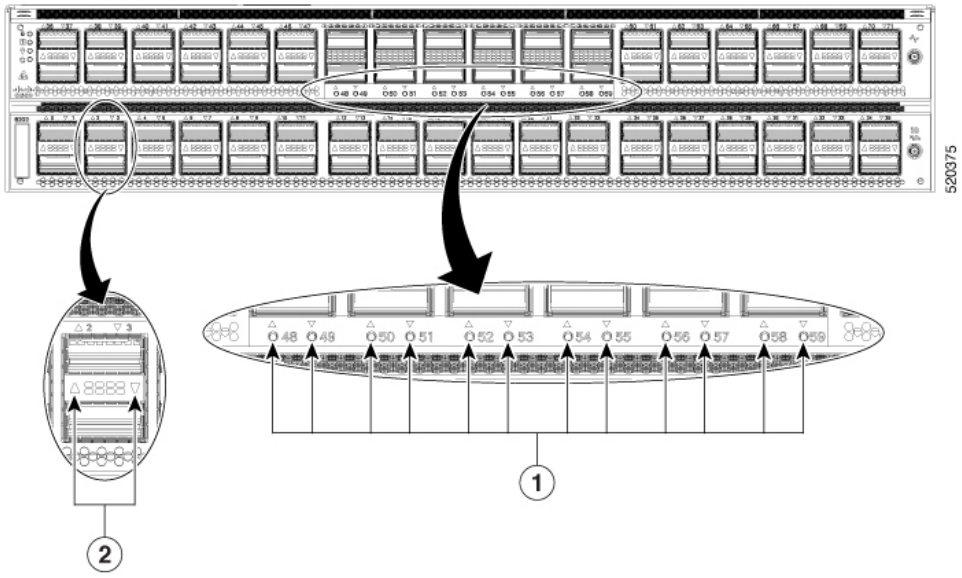
LED	Color	Status
STATUS	Green	Power supply is on and transmitting power to the router.
	Flashing Green	Power supply is connected to input power source but not transmitting power to the router.
	Amber	Power supply failure, due to one of the following conditions: • Over voltage • Over current • Over Temperature • Fan failure
	Flashing Amber	Power supply is operating but a warning condition has occurred, due to one of the following conditions: • High temperature • High power • Slow fan
	Off	Power supply units are not receiving power.

LED	Color	Status
Attention	Flasing Blue	The operator has activated this LED to identify this PSU.
	Off	This PSU is not being identified.

Port Status LEDs

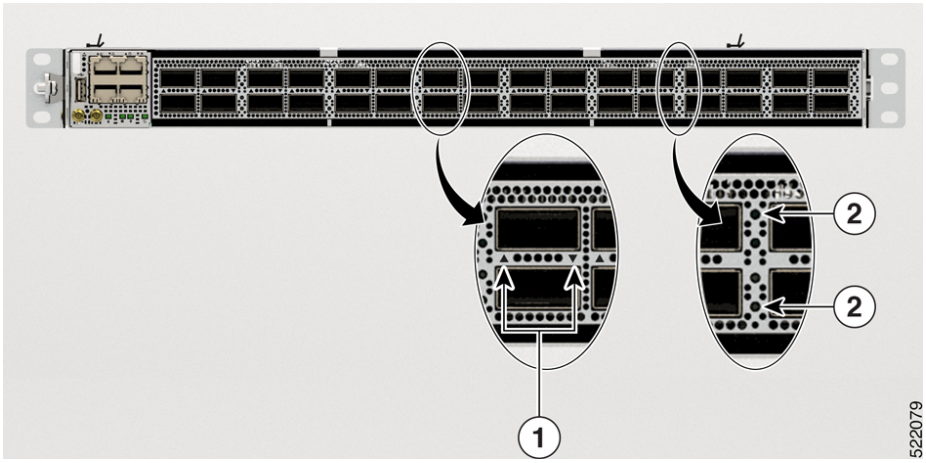
Each port has an LED. The following table describes port status LEDs.

Figure 121: Port Status LED - Cisco 8202 Chassis



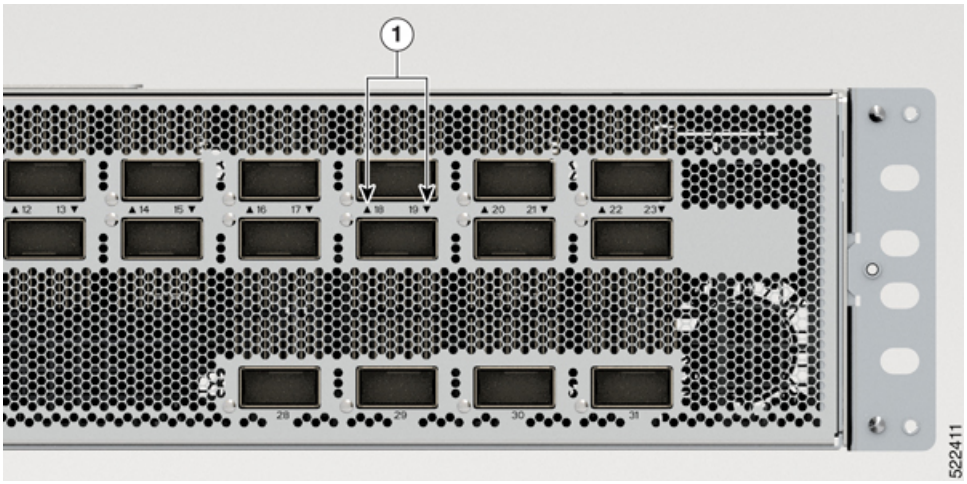
1	400G Port Status LED	2	100G Port Status LED

Figure 122: Port Status LED - Cisco 8201-32FH Chassis



1	400 GbE port	2	400 GbE port status LED

Figure 123: Port Status LED - Cisco 8202-32FH -M Chassis



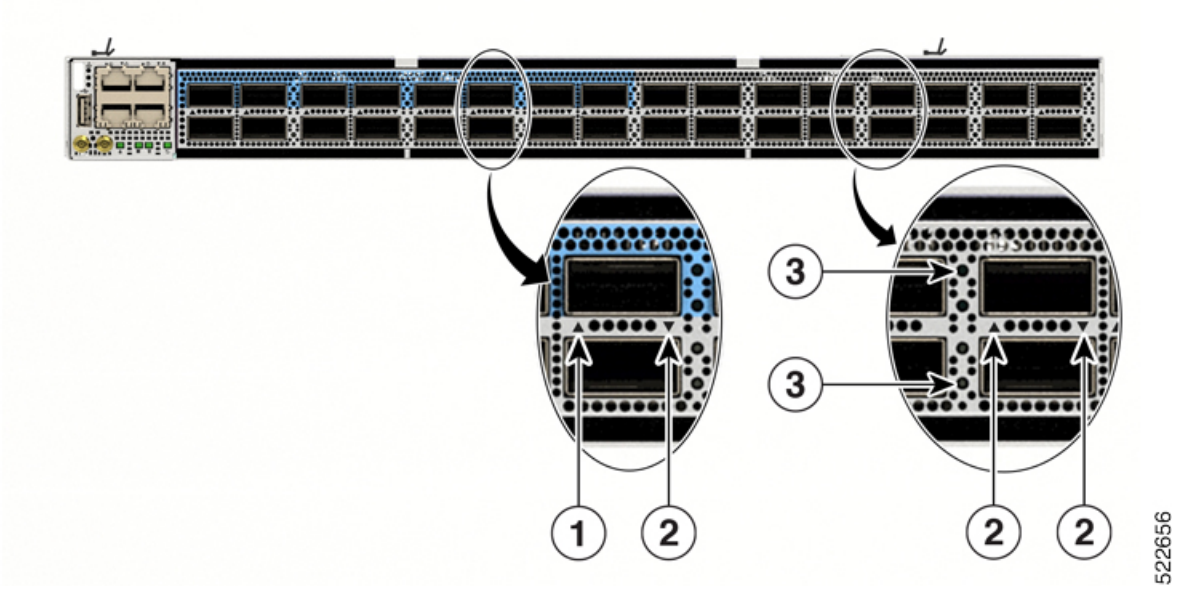
1	400G Port Status LED

Figure 124: Port Status LED - Cisco 8212-48FH -M Chassis



1	Port Status LED

Figure 125: Port Status LED - Cisco 8201-24H8FH Router



1	400 GbE port (blue)	3	Port status LED
2	100 GbE port		

Table 16: 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.