Install the Router

Before you begin this task, ensure that you have read and understood the safety warnings.

Note The installation instructions of the Cisco 8010 Series Routers are similar, and any differences between the router variants are specifically called out.

The illustrations are for reference purpose only, the actual router may vary based on your variant of Cisco 8010 Series Routers.

Installing the the Cisco router involves the following tasks:

Rack Mounting the Router

You can choose to either set up the router on a rack or wall mount it.

We recommend that you use the following racks while mounting the router.

Figure 1: Rack specification EIA (19 inches and 23 inches)

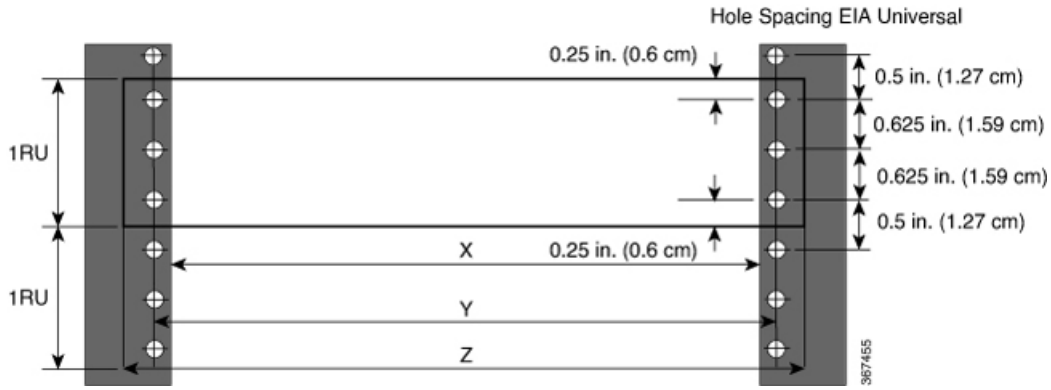
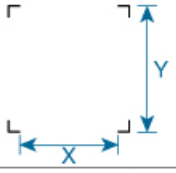
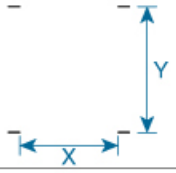
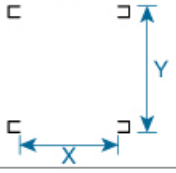


Table 1: Rack specification EIA (19 inches and 23 inches)

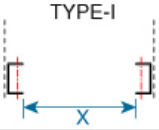
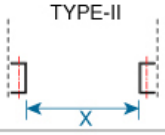
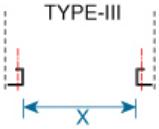
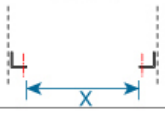
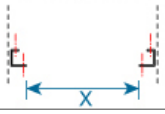
Post Type	Rack Type	Rack Front Opening (X)	Rack Mounting Hole Centre-Centre (Y)	Mounting Flange Dimension (Z)
4 Post	19 inches (48.3 centimeters)	17.75 inches (45 centimeters)	18.31 inches (46.5 centimeters)	19 inches (48.2 centimeters)
2 Post				
4 Post	23 inches (58.4 centimeters)	21.75 inches (55.24 centimeters)	22.31 inches (56.6 centimeters)	23 inches (58.4 centimeters)
2 Post				

Figure 2: Four Post Rack Type

4 – Post Type (Hole EIA Universal)		Width Available (X)	Compatibility
All 23” Type rack		552.45mm (21.75”)	Yes
All ETSI rack (21” rack)		500.0mm (19.68”)	Yes
19” Type rack L-Type Post		17.75” (450.8 mm)	Yes
		17.50” (444.5 mm)	No
19” Type Racks Flat-Post		17.75” (450.8 mm)	Yes
		17.50” (444.5 mm)	No
19” Type racks C- Type Post		17.75” (450.8 mm)	Yes
		17.50” (444.5 mm)	No

367456

Figure 3: Two Post Rack Type

2 – Post Type (Hole EIA Universal)	X – 19" Rack	Compatibility	X-23" Rack	Compatibility
TYPE-I 	17.75" (450.8 mm)	Yes	21.75" (552.45mm)	Yes
	17.50" (444.5 mm)	No	21.75" (552.45mm)	Yes
TYPE-II 	17.75" (450.8 mm)	Yes	21.75" (552.45mm)	Yes
	17.50" (444.5 mm)	No	21.75" (552.45mm)	Yes
TYPE-III 	17.75" (450.8 mm)	Yes	21.75" (552.45mm)	Yes
	17.50" (444.5 mm)	No	21.75" (552.45mm)	Yes
L-TYPE 	17.75" (450.8 mm)	Yes	21.75" (552.45mm)	Yes
	17.50" (444.5 mm)	No	21.75" (552.45mm)	Yes
Uneven-TYPE 	17.75" (450.8 mm)	Yes	21.75" (552.45mm)	Yes
	17.50" (444.5 mm)	No	21.75" (552.45mm)	Yes

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Rack Mounting Brackets

The router is shipped with rack mounting brackets that are to be secured on the sides of the router.

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

Table 2: Rack-Mount Kit Product Identification Number

Product Identification Number	Description
RCKMT-19-V1	19 inch rack mounting kit
RCKMT-23-V1	23 inch rack mounting kit
RCKMT-ETSI-V1	ETSI rack mounting kit
53-101699-01	Grounding lug kit
CBL-BRKT-V1	Cable management
53-101650-01	Wall mount bracket

Table 3: Router Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
8	M4 x 0.7 x 7-mm Phillips flat-head screws
4 (48-101690-01)	SCR, M, PAN, PH, 12-24 x 0.49"L, CSwZN, nickel alloy

Caution

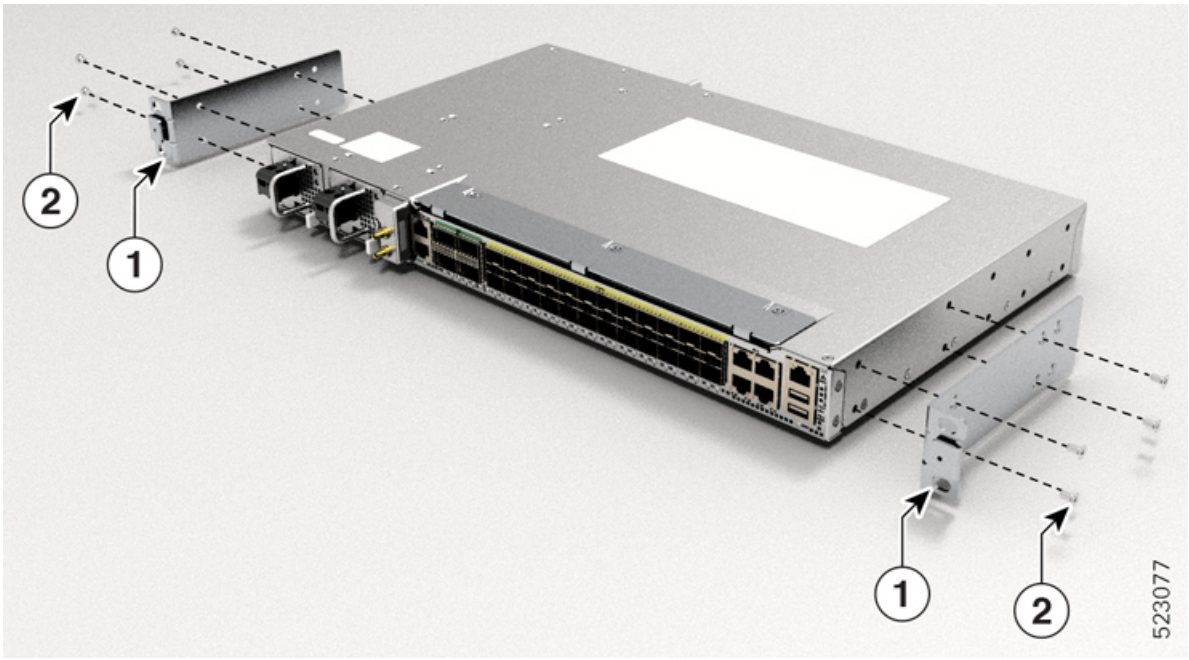
- Ensure that you secure the lugs only with the Cisco-provided screw or a Phillips head screw with an integrated washer of 10-32 x 0.3125 inch. Secure the screws only while assembling the lugs.
- Using excessive length screw for mounting the grounding lug may cause short-circuit as it may come in contact with parts inside the router.

Mounting the Router on the Rack

To mount the router on the rack:

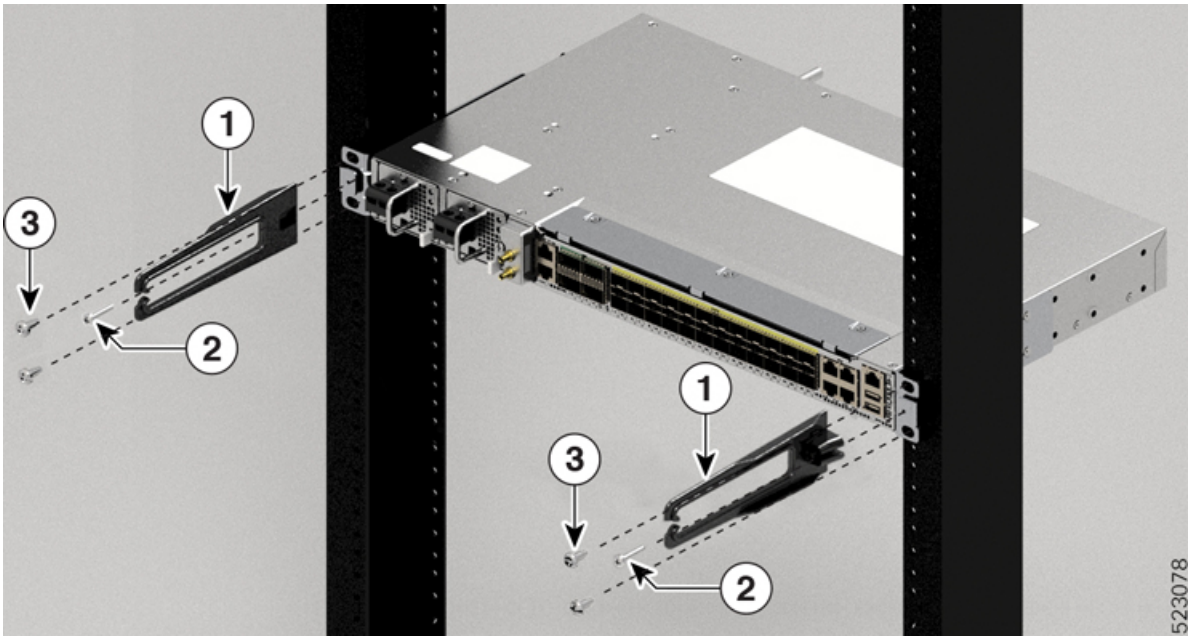
1. Attach the rack-mount brackets and the cable guides to the router as follows:
   a. The router has port-side intake modules, position the router so that its ports are facing the cold aisle.
   b. Position the bracket ears facing front or middle rack-mount, on the side of the chassis so that the holes are aligned.
   c. Use four M4 screws to attach the brackets to the chassis. Tighten the M4 screws to 13.3 inch-pounds (1.5 Nm).

Figure 4: Installing 19 inch Rack-Mount Brackets in the Front



1	Mount Bracket
2	Screw

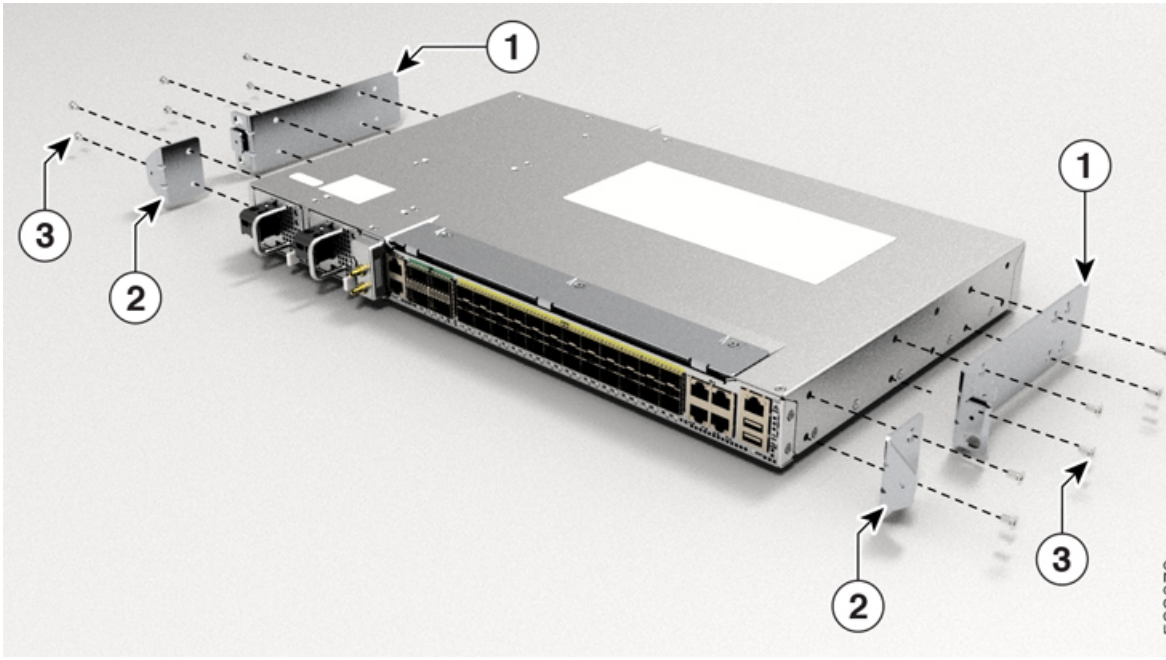
Figure 5: Installing Cable Management and 19 inch Rack-Mount Brackets in the Front



1	Cable Management Bracket

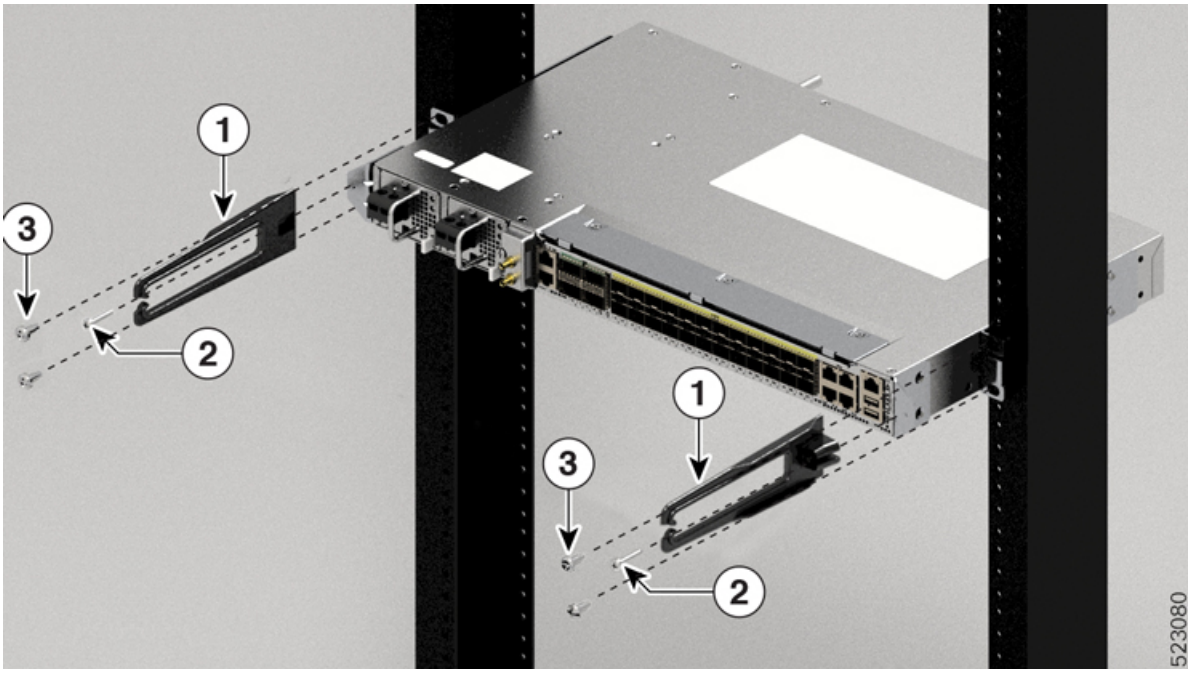
2	Cable Management Screw
3	Screw

Figure 6: Installing 19 inch Rack-Mount Brackets in the Middle



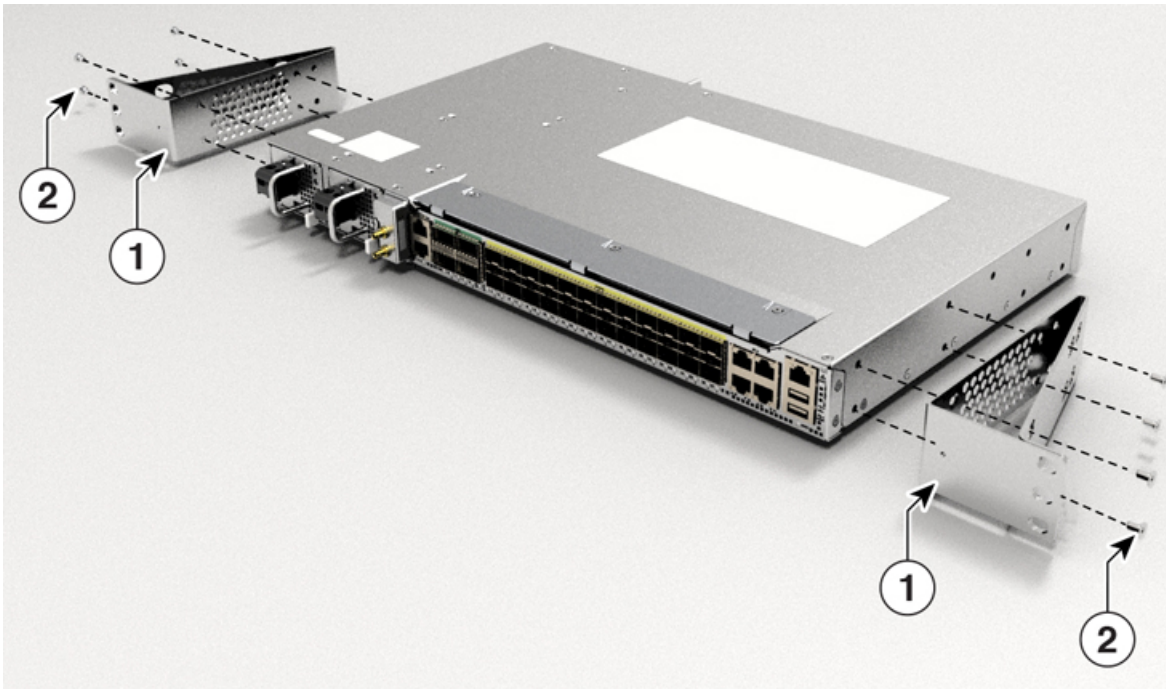
1	Mount Bracket
2	Cable Management Bracket
3	Screw

Figure 7: Installing Cable Management and 19 inch Rack-Mount Brackets in the Middle



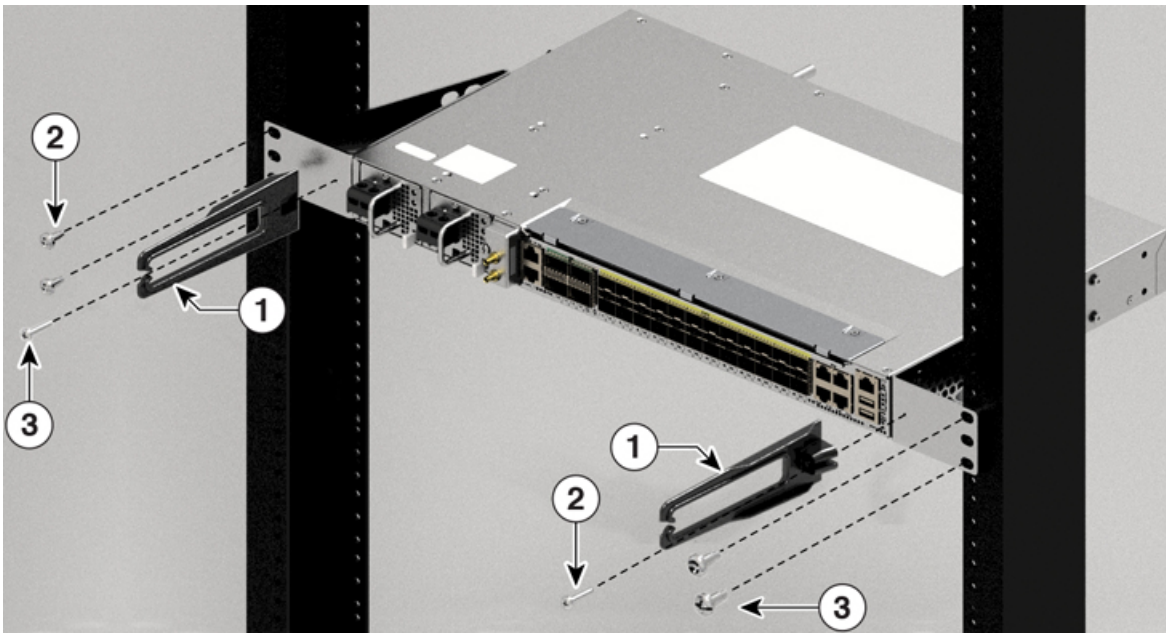
1	Cable Management Bracket
2	Cable Management Screw
3	Screw

Figure 8: Installing 23 inch Rack-Mount Brackets in the Front



1	Mount Bracket
2	Screw

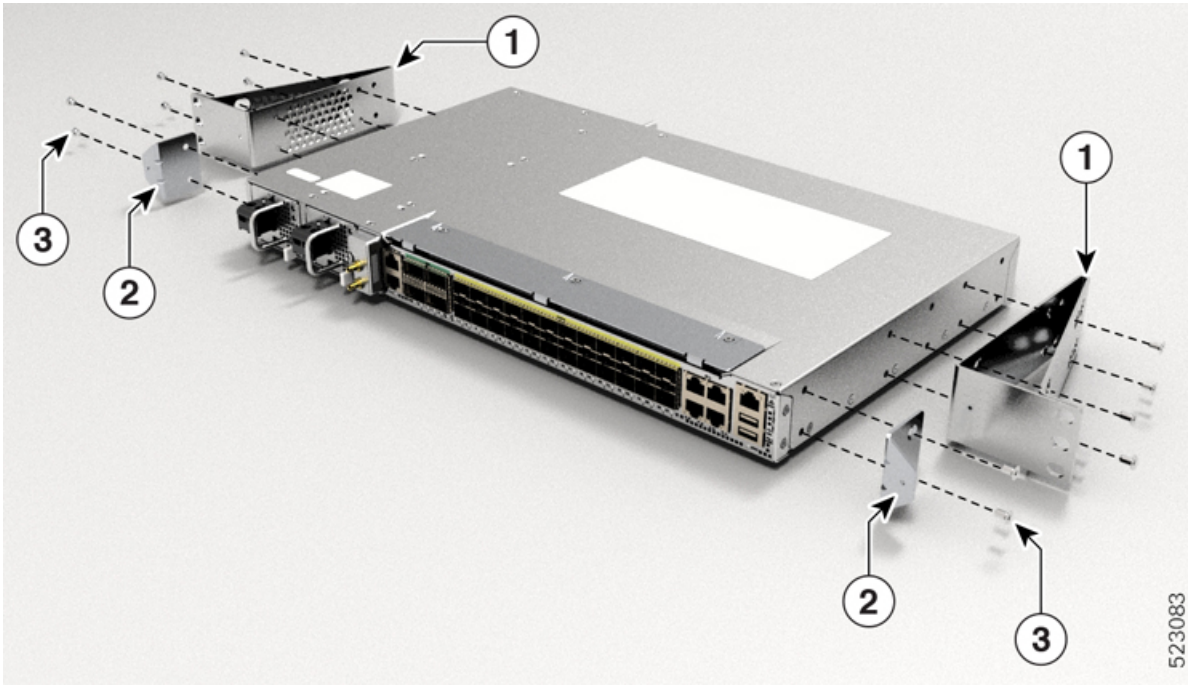
Figure 9: Installing Cable Management and 23 inch Rack-Mount Brackets in the Front



1	Cable Management Bracket

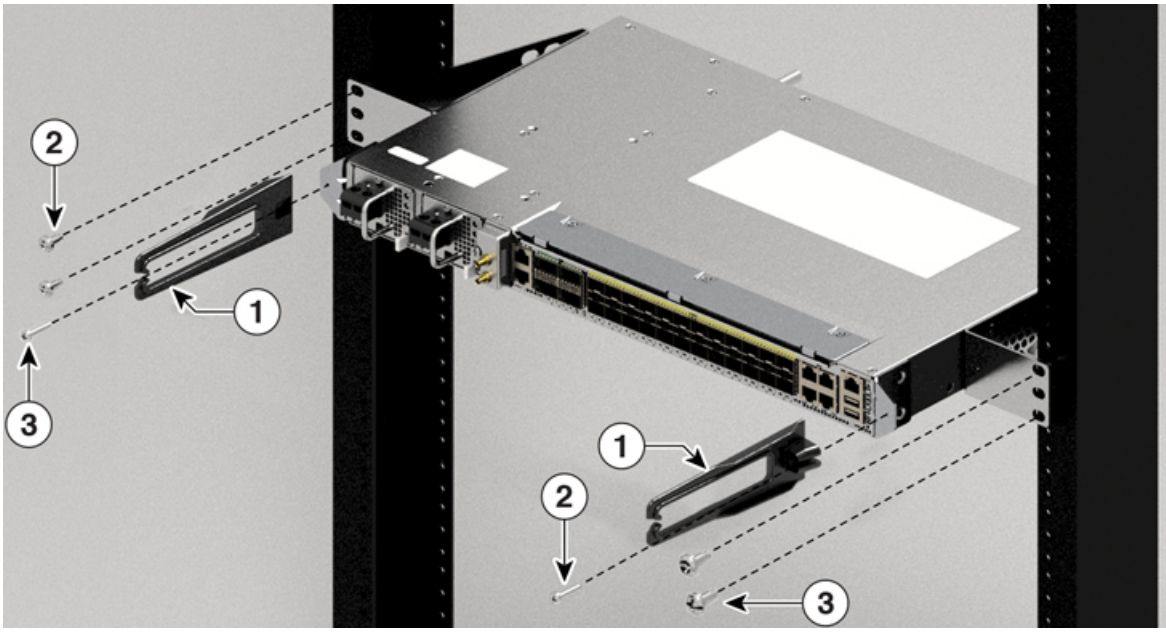
2	Cable Management Screw
3	Screw

Figure 10: Installing 23 inch Rack-Mount Brackets in the Middle



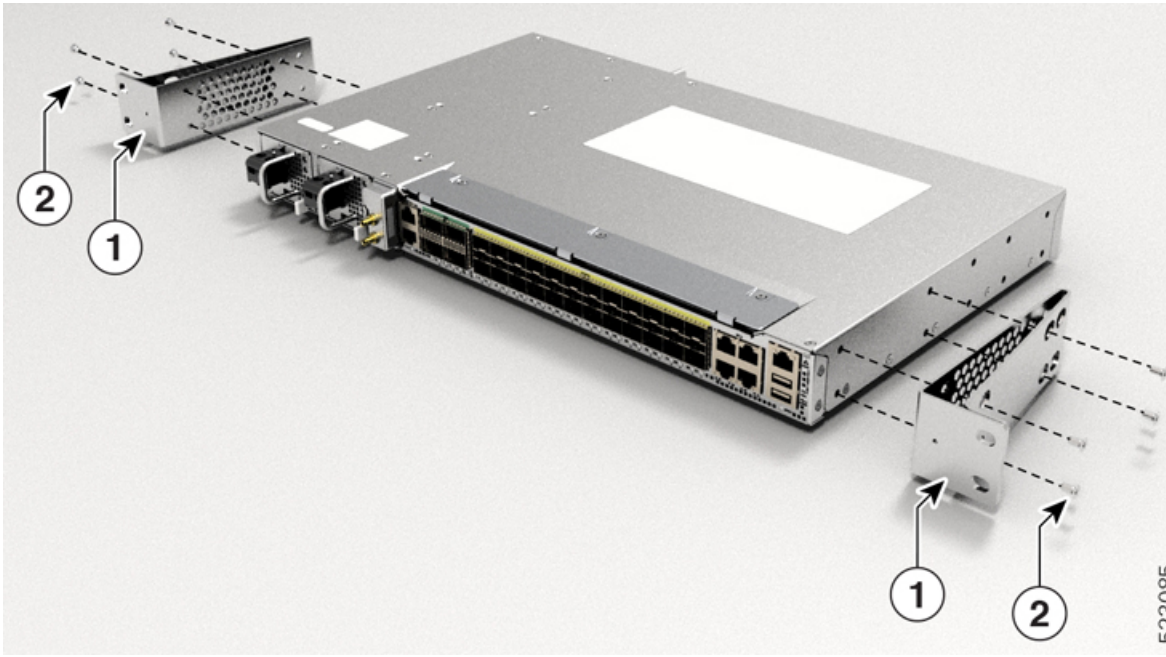
1, 2	Mount Bracket
3	Screw

Figure 11: Installing Cable Management and 23 inch Rack-Mount Brackets in the Middle



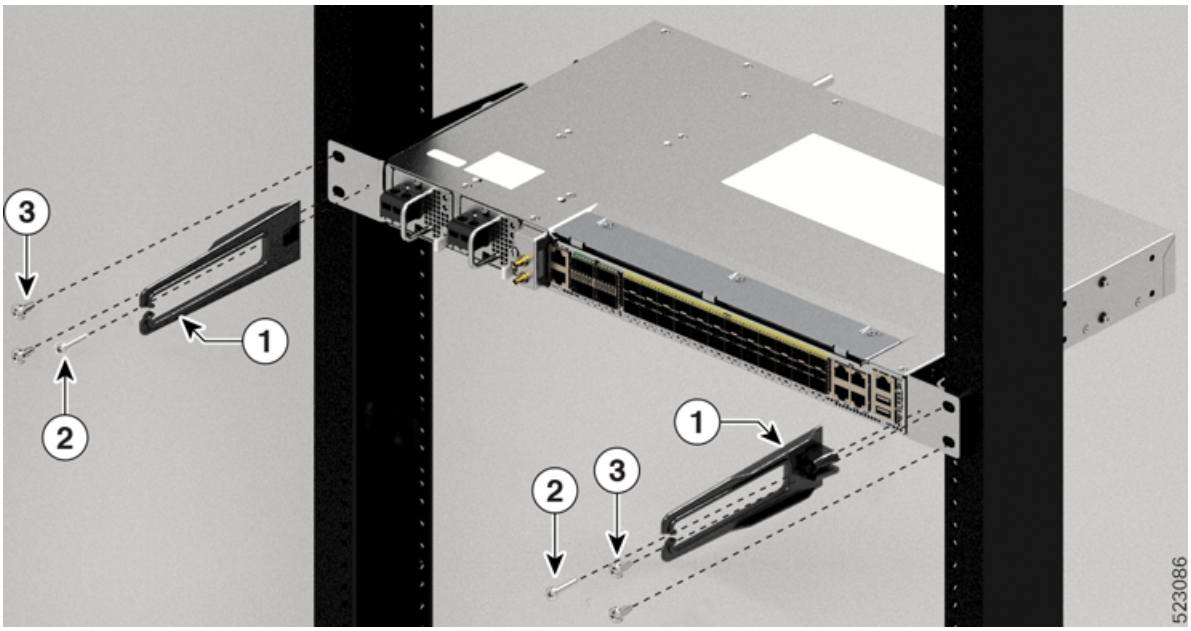
1	Cable Management Bracket
2	Cable Management Screw
3	Screw

Figure 12: Installing ETSI Rack-Mount Brackets in the Front



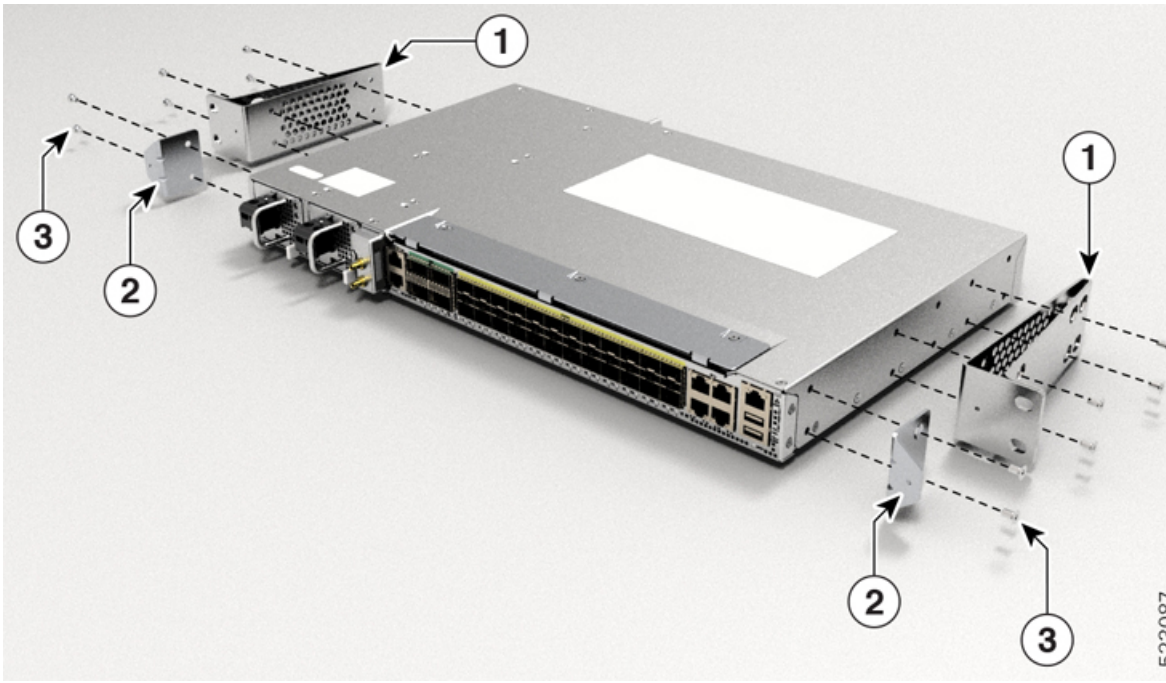
1	Mount Bracket
2	Screw

Figure 13: Installing Cable Management and ETSI Rack-Mount Brackets in the Front



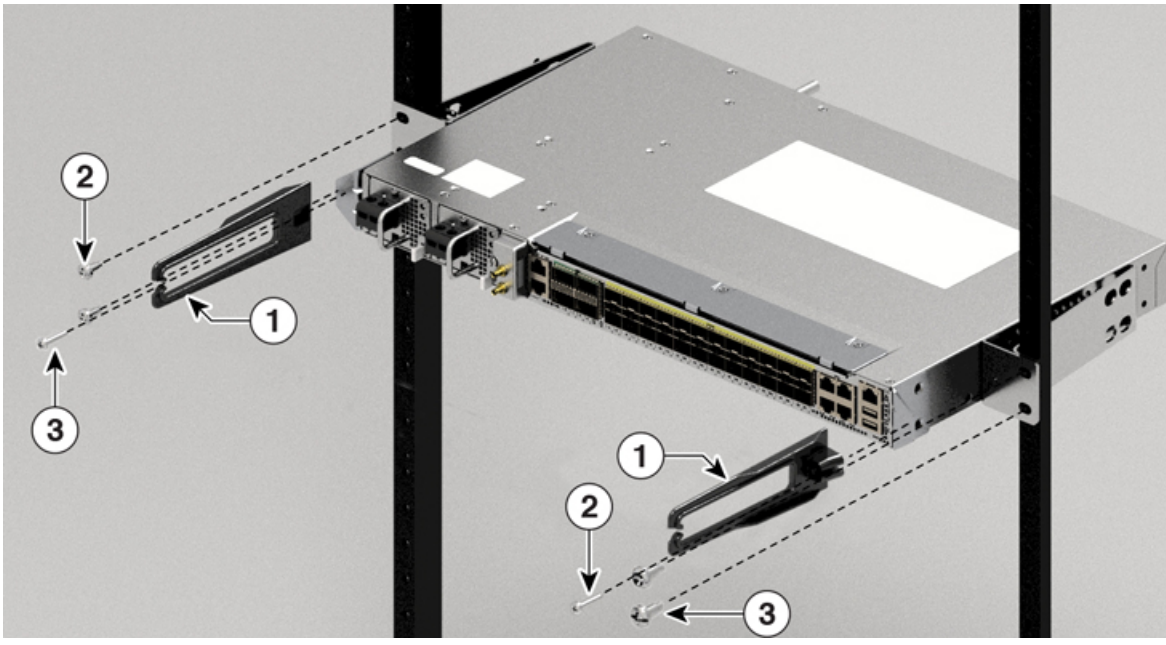
1	Cable Management Bracket
2	Cable Management Screw
3	Screw

Figure 14: Installing ETSI Rack-Mount Brackets in the Middle



1,2	Mount Bracket
3	Screw

Figure 15: Installing Cable Management and ETSI Rack-Mount Brackets in the Middle



1	Cable Management Bracket

2	Cable Management Screw
3	Screw

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

e. Use four 12-24 screws and mount the router to the rack.

2. Install the router onto the 2-post rack as follows:

a. Lift and position the router into position between the two rack posts.

b. Move the router until the rack-mount brackets come in contact with the two rack posts.

c. Hold the chassis at level and have another while the second person inserts two screws 12-24 in each of the two rack-mount brackets (using a total of four screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails.

d. Tighten the 12-24 screws to 30 in-lb (3.39 N.m).

Wall Mount

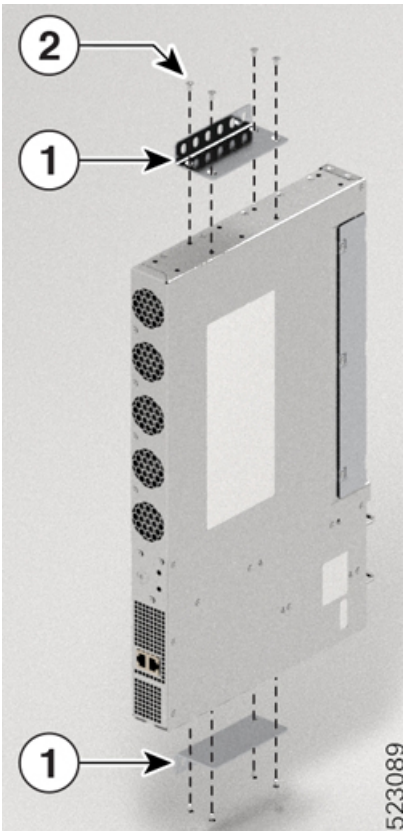
The router is shipped with wall mounting brackets that are to be secured on the sides of the router.

Install the wall mounting brackets and cable guides on to the chassis before you mount the chassis on the wall.

Install Wall Brackets

1. Remove the wall mounting brackets from the accessory kit and position them beside the router. You can install the brackets as shown in the figure.

Figure 16: Install Wall Mount Brackets



1	Wall Mount Bracket
2	Screw

2. Secure the bracket to the router with the recommended maximum torque of 13.3 inch-pounds (1.5 newton meters) using M4 flat head screws.

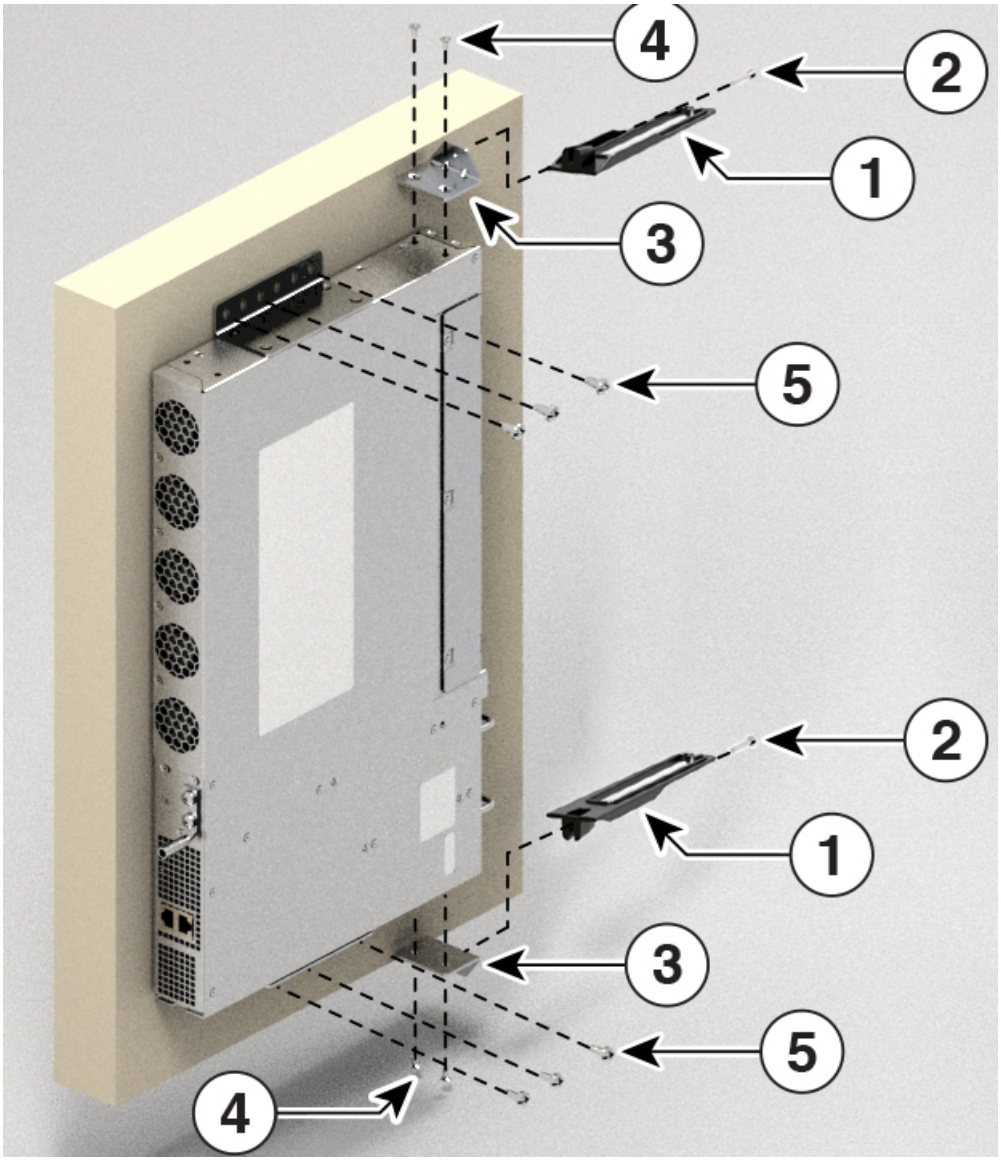
Wall Mount the Router

Caution Before mounting the router, ensure that all unused holes at the sides of the router are always protected by screws.

Note While you mount the router, always ensure that the power supplies are at the bottom position.

For the support of the router and cables, ensure that the router is attached securely to wall studs or to a firmly attached plywood mounting backboard.

Figure 17: Install Brackets to Wall



1	Cable Management
2	Cable Management Screw
3	Cable Management Bracket
4	Cable Management Bracket Screw
5	Wall Mount Bracket Screw

Ground the Router

Before you begin this task, ensure that you have read and understood the safety warnings in the Preventing ESD Damage section of the *Safety Warnings* handout.

Before you connect the power or turn on the power to the router, you must provide an adequate router ground (earth) connection to your router.

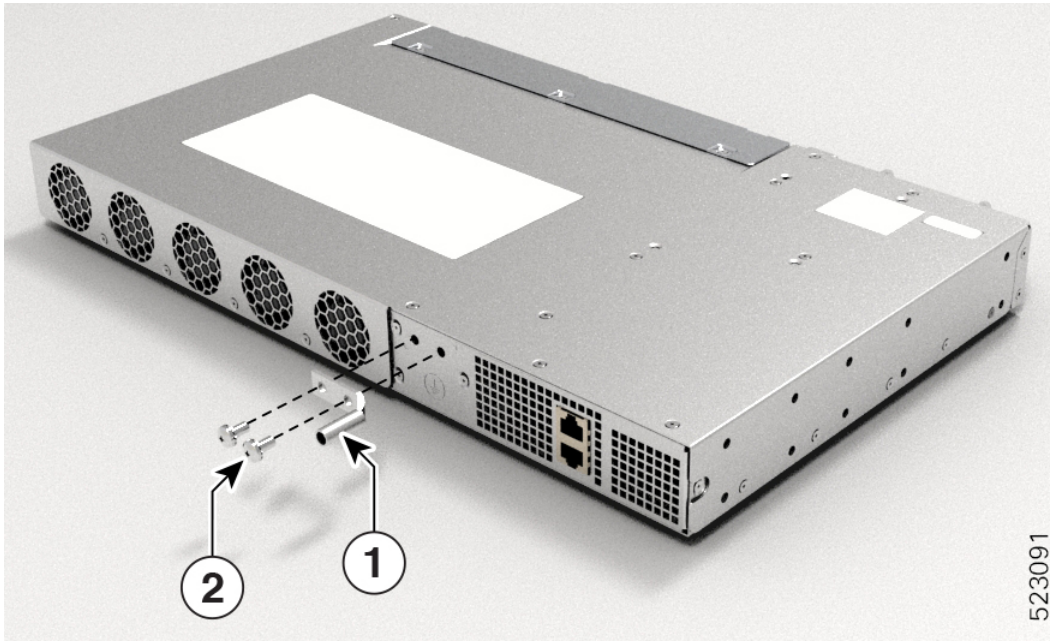
This section describes how to ground the router. The grounding lug location is on the back panel of the router.

Note A minimum of 5 inches (127 mm) space must be provided at the rear to accommodate 90 degree grounding lug with a minimum bend radius for 6 AWG ground cable.

To ground the router:

1. Verify that the ground cable is connected to the top of the rack and according to local site practice.

Figure 18: Ground Lug



1	Lug (Part number is 32-0608-01)
2	Screw (Part number is 48-101620-01)

Caution Use only Cisco supplied screws for mounting the grounding lugs. If procured from local market or from outside other source, ensure that the grounding lug screw length should not exceed 0.365 inches (9.27 mm). Using excessive length screw for mounting the grounding lug may cause short-circuit as it may come in contact with parts inside the router.

2. Attach one end of the shelf ground cable (No. 6 AWG cable) to the ground point on the rear of the router using the specified dual-hole lug connector.
   a. Use a wire-stripping tool to remove approximately 0.75 inches (19 mm) of the covering from the end of the grounding cable.
   b. Insert the stripped end of the grounding cable into the open end of the grounding lug.
   c. Use the crimping tool to secure the grounding cable in the grounding lug.
   d. Remove the adhesive label from the grounding pad on the chassis.
   e. Place the grounding lug against the grounding pad so that there is solid metal-to-metal contact, and insert the two 10-32 screws with washer through the holes in the grounding lug and into the grounding pad. Tighten the 10-32# screws to 27.5 inch-pounds (3.1 Nm).
   f. Ensure that the lug and cable do not interfere with other equipment.
   g. Prepare the other end of the grounding cable and connect it to an appropriate grounding point in your site to ensure adequate earth ground.

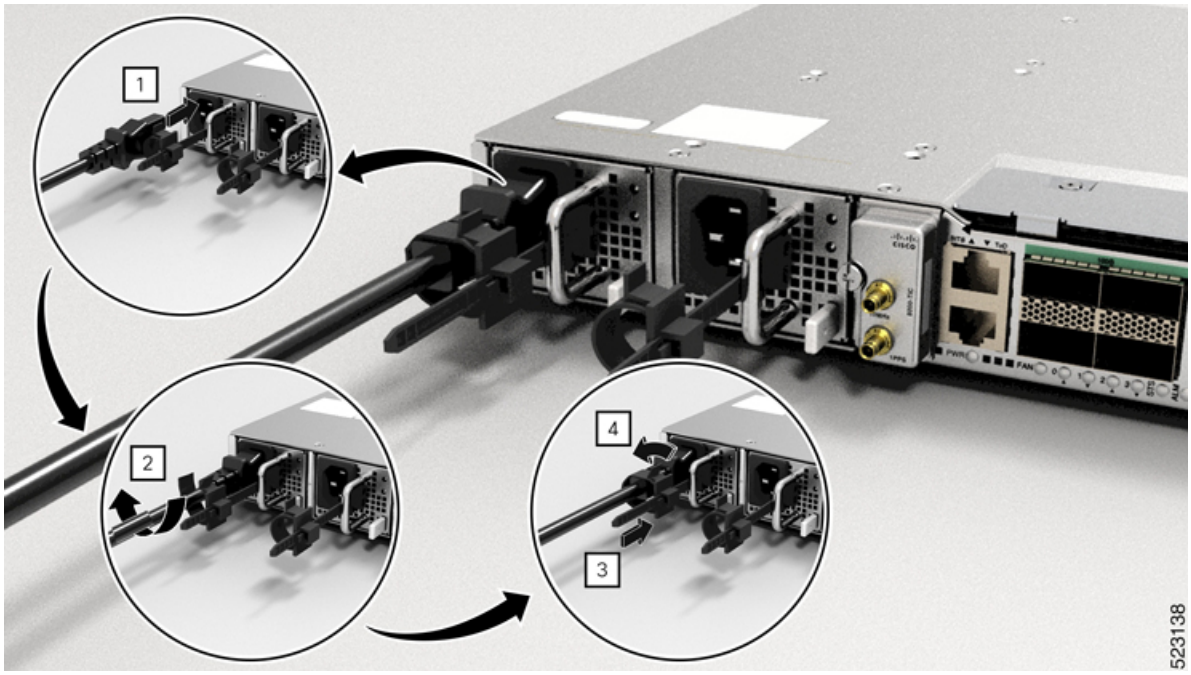
Install the AC Power Cables

Note A dual pole breaker is needed for the installation. The rating of the dual pole breaker for 110V is 20A and for 220V is 16A. The minimum cable size is 14AWG for 110V and 16AWG for 220V.

To install the AC power cables in the power supply slots:

1. Plug the power supply cord in to the power supply module.
2. Wrap the tie around the power supply cord.
3. Ensure that the power supply cord is secured to the power supply module.
4. Tighten the tie around the power supply cord as shown.
5. Ensure that the power cord is secured always to a cable support to ensure the cable load doesn’t act on the PSU.

Figure 19: Attach the AC Power Cables



Note These images are for representation purpose only. Certain Cisco 8011 Series Routers may not include a tie for the power supply cord.

1	Insert power cord
2	Wrap power cord with tie
3	Attach the power cord
4	Secure power cord with tie

Turn On an AC Power Supply Module

Perform the following procedure to activate an AC power supply:

1. Plug the power cord into the power supply.
2. Connect the other end of the power cord to an AC-input power source.
3. Verify power supply operation by checking if the respective power supply front panel LED (PM0 or PM1) is green.
4. If the LEDs indicate a power problem, see *Appendix* for troubleshooting information.
5. If you're also connecting a redundant AC power supply, repeat these steps for the second power source.

Note If you're connecting a redundant AC power supply, ensure that each power supply is connected to a separate power source in order to prevent power loss in the event of a power failure.

The operating voltage range is 100V-240VAC, 50/60Hz, 5-2.2A maximum.

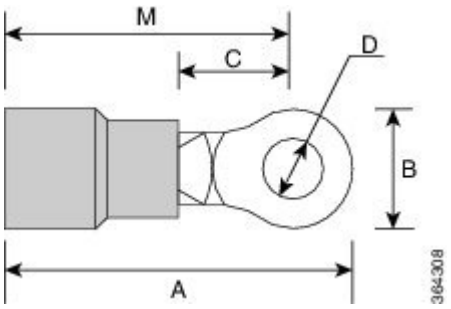
Install the DC Power Cables

Note When installing DC power supply, use 14AWG for longer cables and 14-16AWG for shorter cables, 90°C temperature rated cable. The recommended cable length is three meters maximum from source.

Note

- Always ensure that the building's installation for short-circuit (overcurrent) protection does not exceed 15A.
- We recommend you to use a circuit breaker or a fast acting fuse with a maximum DC rating, based on the router variants for over current protection.

Figure 20: DC Lug Dimensions



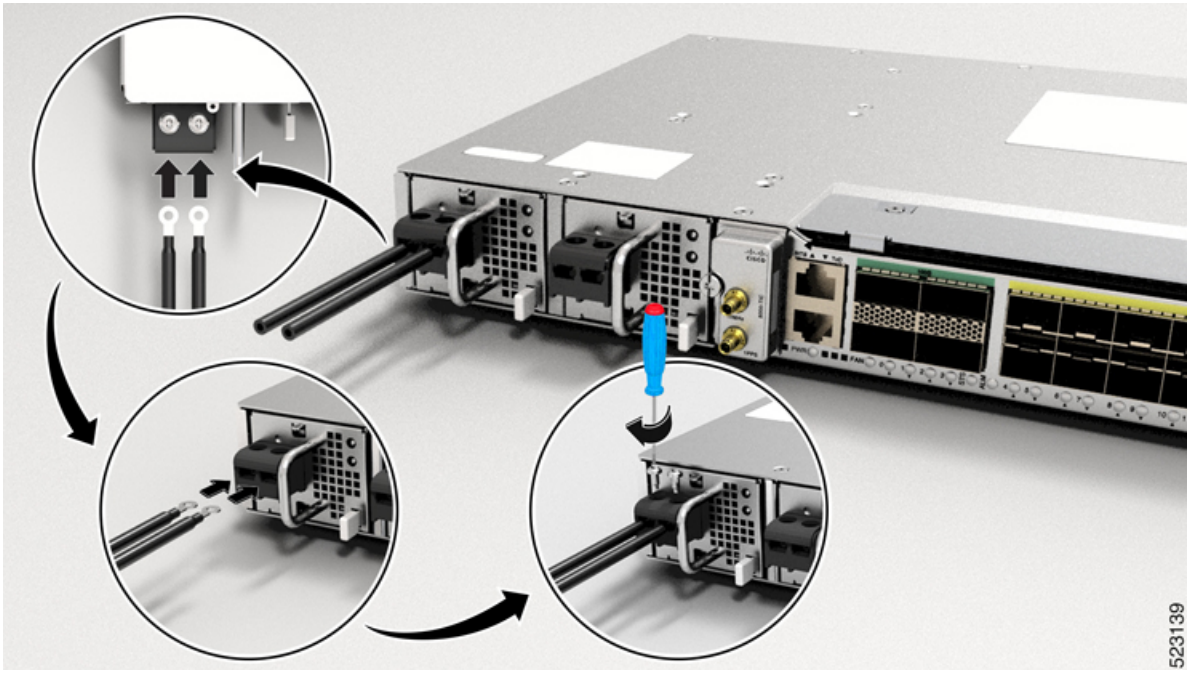
A	0.97 in. (2.4 cm)	C	0.27 in. (0.68 cm)
B	0.31 in. (0.78 cm)	D	0.17 in. (0.43 cm)
M	0.81 in. (2 cm)		

To attach the DC power supplies:

1. Locate the terminal block plug.
2. Insert the DC-input power source wires into the terminal block plug.
3. Attach the DC supply wires using the designated screws.

4. Use a ratcheting torque screwdriver to torque the terminal block plug captive screw. (See the following figure.)

Figure 21: Attach the DC Power Supply Wires



Note These images are for representation purpose only. Certain Cisco 8011 Series Routers may not include a tie for the power supply cord.

Turn On a DC Power Supply Module

Perform the following procedure to activate a DC power supply:

1. Verify the power supply operation by checking whether the respective power supply front panel LED (PS0 or PS1) is green.
2. If the LEDs indicate any issues with power problem, see *Appendix*.
3. If you are also connecting a redundant DC power supply, repeat these steps for the second power source.

Note If you are connecting a redundant DC power supply, ensure that each power supply is connected to a separate power source in order to prevent power loss in the event of a power failure.

The operating voltage range is 48V to 60VDC, 12A maximum.

Port Connection Guidelines

Depending on the chassis, you can use Quad Small Form-Factor Pluggable Plus (QSFP+), QSFP28, SFP, SFP+, and RJ45 connectors to connect the ports on the line cards 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 router, remove the cable from the transceiver.

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

- Wear an ESD-preventative wrist strap that is connected to an earth ground whenever handling transceivers. The router is typically grounded during installation and provides an ESD port to which you can connect your wrist strap.
- 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 and 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 for 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.

Connect to the Console Port

- The router must be fully installed in its rack, 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 DB9F/RJ45 adapter are provided in the router accessory kit.
    - Network cabling should already be routed to the location of the installed router.

Before you create a network management connection for the router or connect the router to the network, you must create a local management connection through a console terminal and configure an IP address for the router. You also can use the console to perform the following functions (each of which can be performed through the management interface after you make that connection):

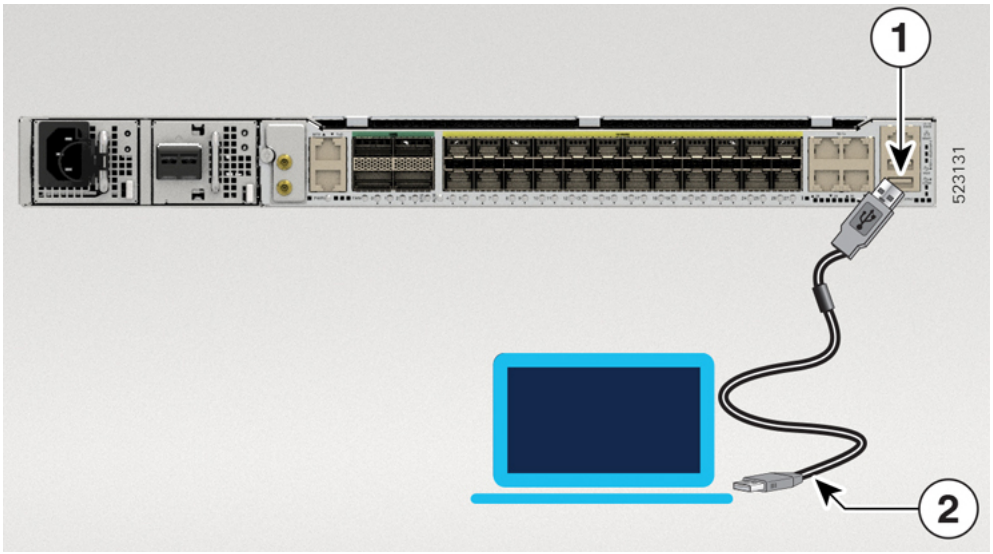
- Configure the router using the command-line interface (CLI).
- Monitor network statistics and errors.

- Configure Simple Network Management Protocol (SNMP) agent parameters.
- Download software updates.

The system console port is an RJ45 receptacle for connecting a data terminal to perform the initial configuration of the router. The console cable is shipped with the hardware.

Note Only RJ45 to DB-9 adapter cable is provided in the package.

Figure 22: Connecting the USB Type-A Console Cable to the Chassis



1	USB Type-A console port	2	USB Type-A to USB Type-A cable

Follow this procedure to connect a data terminal to the console port:

1. Set your terminal to these operational values: 115200 bps, 8 data bits, no parity, and two stop bits.
2. Attach the terminal end of the cable to the interface port on the data terminal.
3. Attach the other end of the cable to the console port.

Connect to the Management Ethernet Port

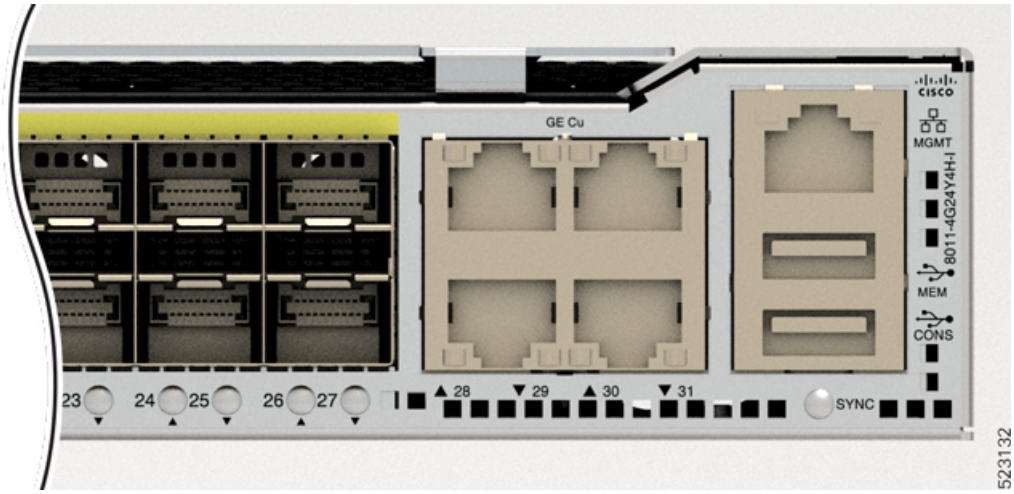
You must complete the initial router configuration.

The management Ethernet port provides out-of-band management, which enables 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 RJ45 interface.

Note To prevent an IP address conflict, do not connect the management Ethernet port until the initial configuration is complete.

To connect cables to the system management port, attach Category 5 cables directly to the RJ45 receptacle on the management Ethernet port.

Figure 23: Connect to the Management Ethernet Port



Note To comply with GR-1089-CORE, the intra-building port(s) of the equipment must use shielded intra-building cabling or wiring that is grounded at both ends.

1. Plug the cable directly into the RJ45 receptacle.
2. Connect the network end of your RJ45 cable to a switch, hub, repeater, or other external equipment.

Connecting Timing Cables

The following sections describe how to connect timing cables.

Connecting Cables to Timing Interfaces Card

Perform the following steps on how to connect cables from the router to a Timing Interfaces Card unit for input 10Mhz or 1PPS interface.

1. Connect one end of a mini-coax cable to the Timing Interfaces Card unit.
2. Connect the other end of the mini-coax cable to the 10MHz or 1PPS port on the router.

Install and Remove Transceiver Module

This section shows how to install and remove transceiver module.

Safety Precautions for Module Installation and Removal

Be sure to observe the following safety precautions when you work on the chassis.

Warning **Statement 1006—**Chassis Warning for Rack-Mounting and Servicing

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

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

Warning **Statement 1008—**Class 1 Laser Product

This product is a Class 1 laser product.

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

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

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

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

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

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

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

Install and Remove SFP Modules

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

Caution Protect all the unused ports by inserting clean dust covers or dust caps into them.

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 1056—**Unterminated Fiber Cable

Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments, for example, eye loupes, magnifiers, and microscopes, within a distance of 100 mm, may pose an eye hazard.

Caution Protect the line card by inserting a clean SFP/SFP+ module cage cover (shown in the following figure) into the optical module cage when there is no SFP or SFP+ module installed. The SFP/SFP+ module cage cover is not a standard part of the accessories kit.

Figure 24: SFP/SFP+ Module Cage Cover

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

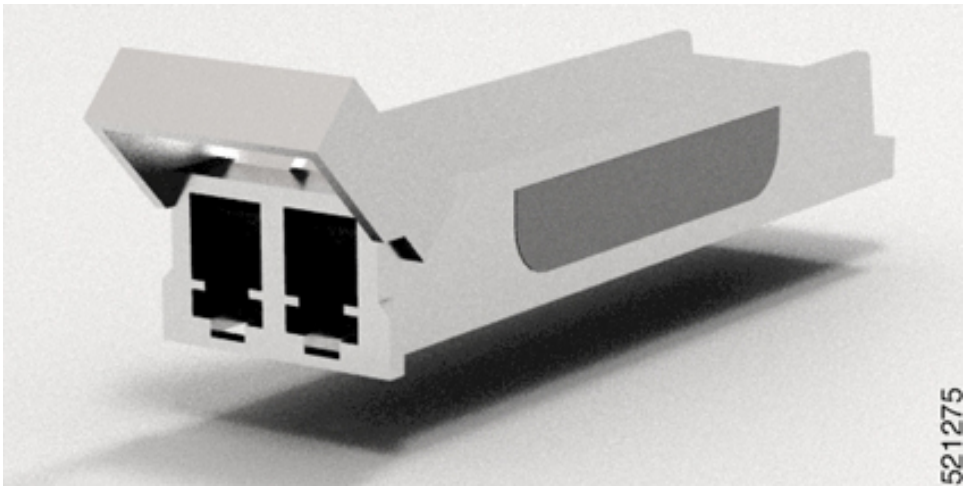
Caution We strongly recommend that you do not install or remove the SFP or SFP+ module with fiber-optic cables attached to it because of the potential of damaging the cable, the cable connector, or the optical interfaces in the module. Disconnect all cables before removing or installing an SFP or SFP+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

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

Bale Clasp SFP or SFP+ Module

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

Figure 25: Bale Clasp SFP or SFP+ Module

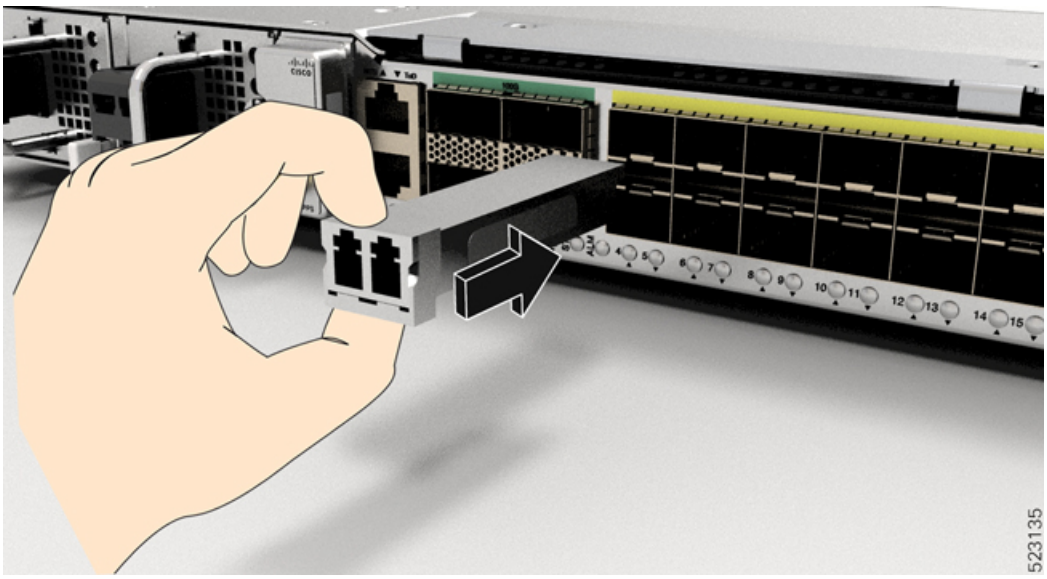


Install a Bale Clasp SFP or SFP+ Module

To install this type of SFP or SFP+ module:

1. Attach an ESD-preventive wrist or ankle strap and follow its instructions for use.
2. Close the bale clasp before inserting the SFP module.
3. Line up the SFP module with the port and slide it into the port. (See the figure below.)

Figure 26: Installing a Bale Clasp SFP Module into a Port



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

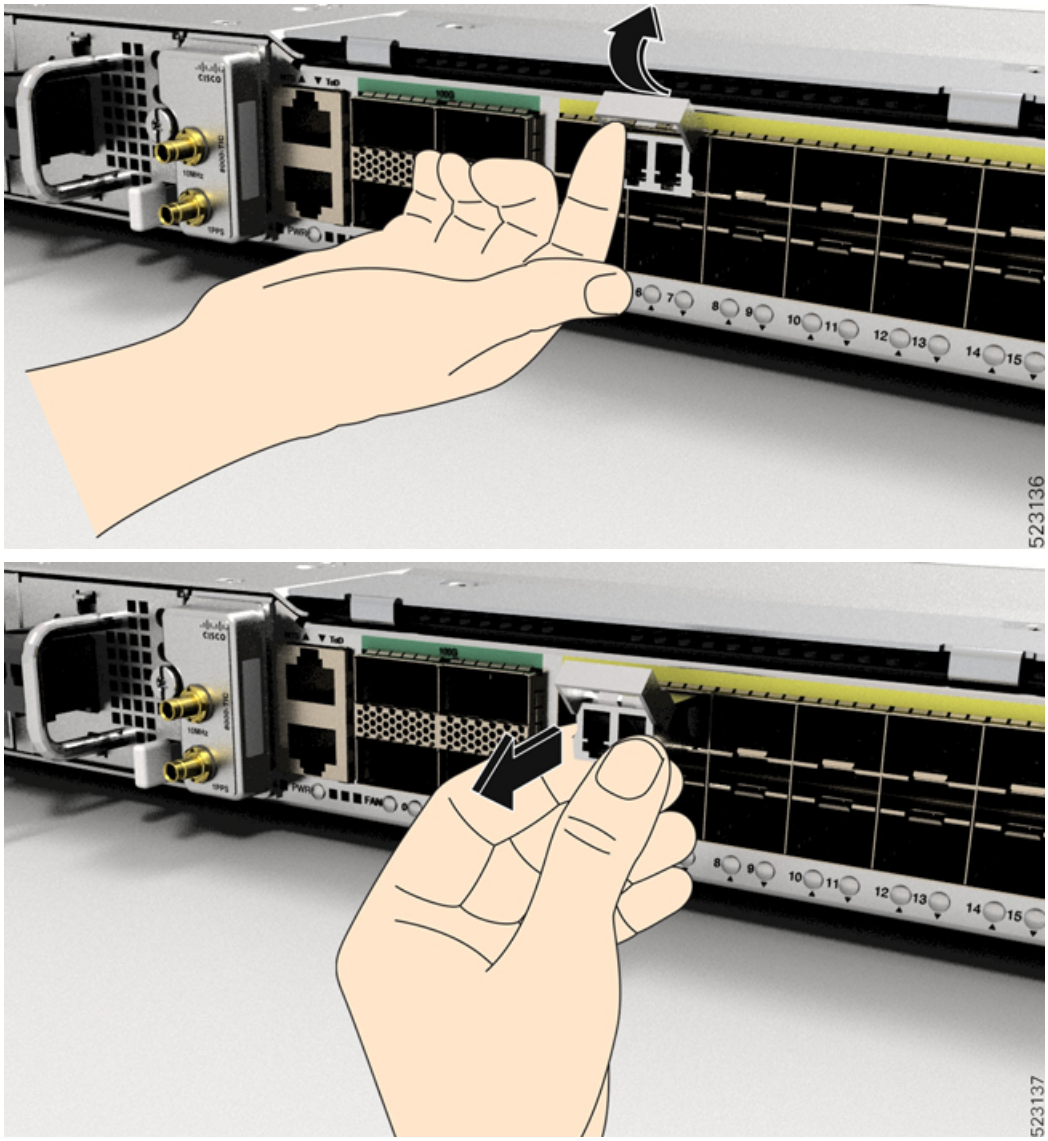
Remove a Bale Clasp SFP or SFP+ Module

To remove this type of SFP or SFP+ module:

1. Attach an ESD-preventive wrist or ankle strap and follow its instructions for use.
2. Disconnect and remove all interface cables from the ports; note the current connections of the cables to the ports on the line card.
3. Open the bale clasp on the SFP module with your index finger, as shown in the figure below. If the bale clasp is obstructed and if you cannot open it, use your index finger, use a small flat-blade screwdriver or other long, narrow instrument to open the bale clasp.
4. Grasp the SFP module between your thumb and index finger and carefully remove it from the port, as shown in the figure below.

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

Figure 27: Removing a Bale Clasp SFP or SFP+ Module



5. Place the SFP module that you removed on an antistatic mat, or immediately place it in a static shielding bag if you plan to return it to the factory.
6. Protect your line card by inserting a clean SFP module cage covers into the optical module cage when there is no SFP module installed.

Connect Interface Ports

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

Connect a Fiber-Optic Port to the Network

Depending on the line card model that you are using, you can use either QSFP+ or QSFP28 transceivers. Some transceivers work with fiber-optic cables that you attach to the transceivers and other transceivers work with pre-attached copper cables. When installing fiber-optic cables for a port, you must install SFP transceivers for 1-Gigabit optical ports or install SFP+ transceivers for 10-Gigabit optical ports or QSFP+ transceivers for 100-Gigabit ports before installing the fiber-optic cable in the transceivers.

⚠

Caution Removing and installing a transceiver can shorten its useful life. Do not remove and insert transceivers more than it is absolutely necessary. We recommended 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

To maintain high signal accuracy and to prevent damage to the connectors, transceivers and fiber-optic cables must be kept clean and free of dust. Attenuation (loss of light) is increased by contamination and should be below 0.35 dB.

Consider the following maintenance guidelines:

- Transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventative wrist strap that is connected to the grounded chassis.
- Do not remove and insert a transceiver more than it is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. Clean them before use to prevent dust from scratching the fiber-optic cable ends.
- Do not touch the ends of connectors. Touching the ends would leave fingerprints and cause other contamination.
- Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or have been accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedures.
- Inspect routinely for dust and damage. Clean and then inspect fiber ends under a microscope to determine whether any damage has occurred.