Removing and Replacing FRUs

This chapter describes procedures for removing and replacing field-replaceable units (FRUs) from Cisco 8500 Series Secure Routers.

Installing an SSD

Before you begin

Perform the following steps before you begin the process of removing and replacing an SSD from a Cisco 8500 Series Secure Router:

- Use an ESD-preventive wrist strap.

- Back up the data that you want to save. To back up the data follow these steps.

  - Back up the data from the SSD to an external device (USB drive or remote file server).

  - Replace the SSD.

  - Install the required software on the new SSD.

  - Restore configurations and user data back to the new SSD.

- Remove the power supplies before you remove the chassis top cover.

Procedure

Step 1   Ensure the router is powered off and all the power supplies are removed from the chassis.

Step 2   If the unit is mounted on a rack, remove the unit from the rack. Then remove rack mount brackets from the side of the chassis. Remove the nine Torx screws on the top surface of the cover, along with the five Torx screws on each side of the cover, using a Torx T8 driver. Then, remove the remaining three screws on the top surface of the cover with a small Phillips screwdriver.
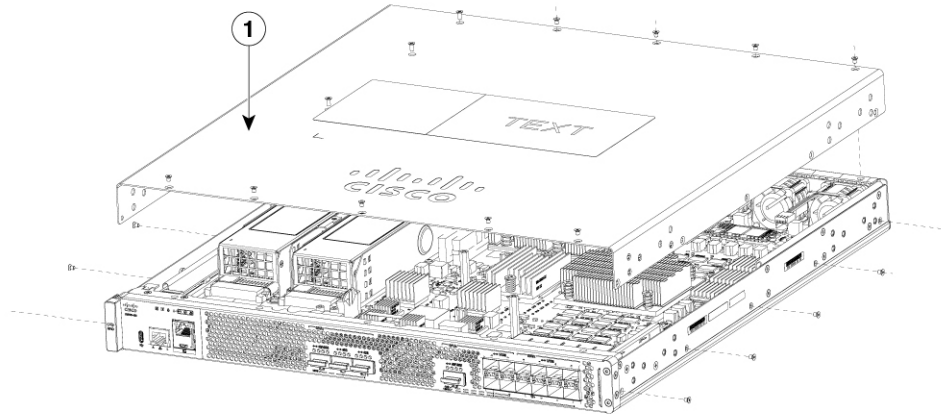
1	Top cover of the chassis after removing screws from the top and side

Step 3   Locate the SSD slot. Carefully insert the SSD at approximately a 30 degree angle to seat the card in the connector. Rotate the card downward until it rests on the small notch in the printed circuit
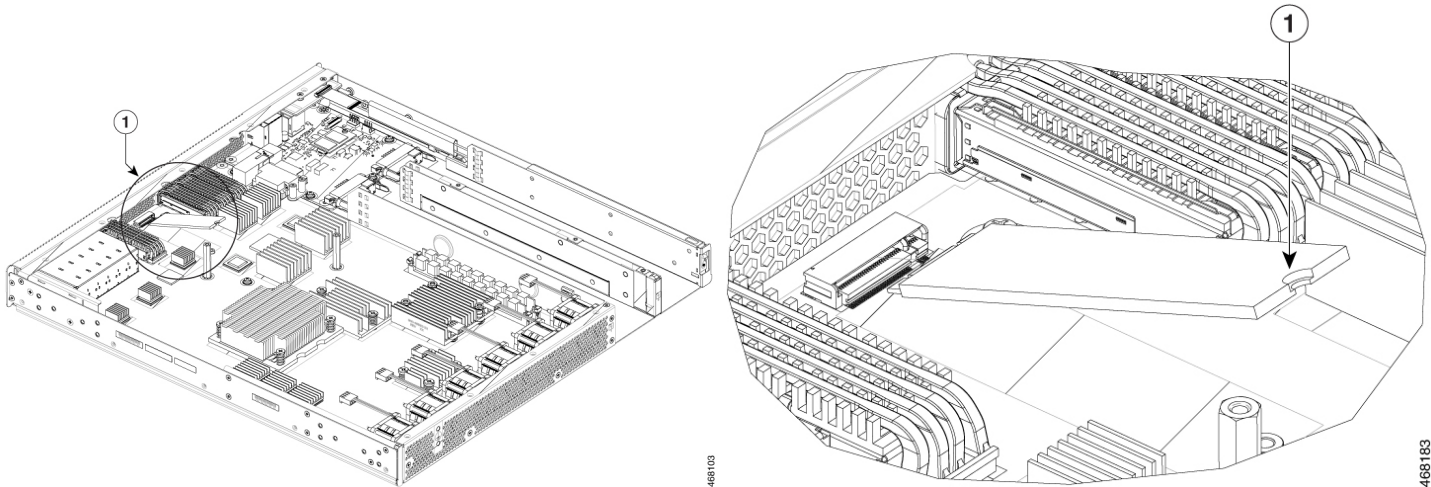
1	The SSD card inserted in the notch in the PCB

Step 4   Install the retention screw in the hole in the SSD and gently tighten to a torque to no greater than 5 in-lbs
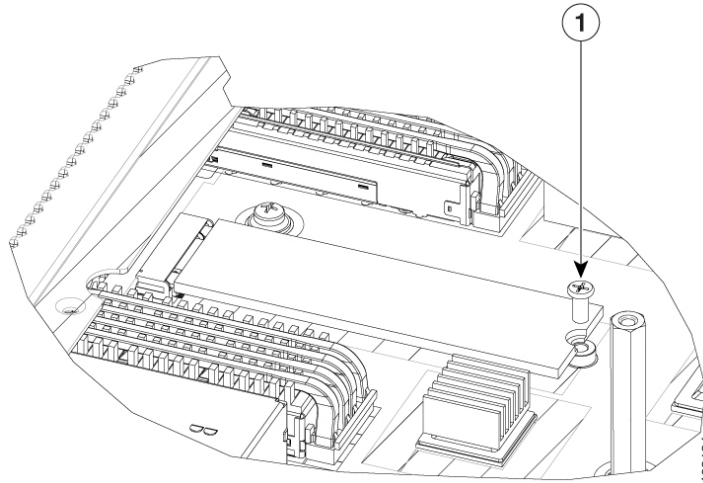
Step 5   Re-install the cover and replace all screws that were removed in step 1.

Removing an SSD

Before you begin

Perform the following steps before you begin the process of removing and replacing an SSD from a Cisco 8500 Series Secure Routers:

- Use an ESD-preventive wrist strap.

- Back up the data that you want to save.

- Remove the power supplies before you remove the chassis top cover.

Procedure

Step 1   Ensure the router is powered off and all the power supplies are removed from the chassis.

Step 2   If the unit is mounted on a rack, remove the unit from the rack. Then remove rack mount brackets from the side of the chassis. Remove the nine Torx screws on the top surface of the cover, along with the five Torx screws on each side of the cover, using a Torx T8 driver. Then, remove the remaining three screws on the top surface of the cover with a small Phillips screwdriver.
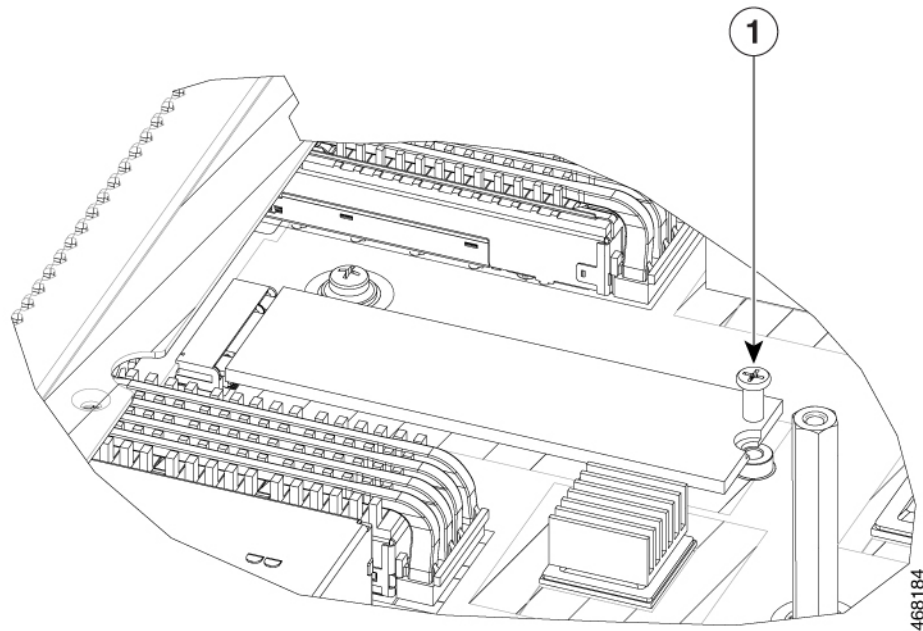
Step 3   Remove the screw retaining the SSD. Keep the screw for inserting a new SSD

module.

1	The screw retaining the SSD

Step 4   After the screw is removed, the SSD module will automatically spring up.

Step 5   Remove the SSD from the socket.

Installing AC power supplies

✎

Note   Do not install the power supplies with the chassis cover off.

Procedure

Step 1   Ensure that the chassis power switch on the chassis is in the Standby position.

> **Note**
> It is not required to place the chassis power switch in the Standby position if you want to hot-swap a single power supply.

Step 2   Insert the power supply module into the appropriate slot(s), making sure that the retention latch is firmly latched. You can verify that the power supply module is firmly latched by gently pulling the power supply handle.

Step 3   Insert the power supply cables firmly into the power supplies.

Note
Ensure that both power supplies are inserted firmly and the power cords are in place.

Step 4 If you have changed the chassis power switch to the Standby position in Step 1, press the power switch to the On position.

The power supply LEDs are illuminated (green).

Removing AC power supplies

Procedure

Step 1 Ensure that the chassis power switch is in the Standby position.

Note
It is not required to place the chassis power switch in the Standby position if you want to hot-swap a single power supply.

Step 2 Unplug the power cable from the power supply.

Step 3 Press the retaining latch towards the pull handle, grasp the handle with one hand, and pull the power supply out of the slot while supporting the weight of the power supply with the other hand.

Step 4 Repeat these steps if it is required to remove the other AC power supply.

Installing DC input power supplies

Warning **Statement 1003**—Power Disconnection

To reduce risk of electric shock, before performing any of the following procedures, ensure that power is removed from the system.

Note Do not install the power supplies with the chassis cover off.

This section describes how to install the DC power supply input power leads to the DC input power supply. Before you begin, read these important notices:

- The color coding of the DC input power supply leads depends on the color coding of the DC power source at your site. Ensure that the lead color coding you choose for the DC input power supply matches the lead color coding used at the DC power source and verify that the power source is connected to the negative (–) terminal and to the positive (+) terminal on the power supply.

- Ensure that the chassis ground is connected on the chassis before you begin installing the DC power supply. Follow the steps provided in the *Chassis Ground Connection* section.

- For DC input power cables, the wire gauge is based on the National Electrical Code (NEC) and local codes for 26 amp service at nominal DC input voltage (–40/–72 VDC). One pair of cable leads, source DC (–) and source DC return (+), are required for each power distribution unit (PDU). These cables are available from any commercial cable vendor. All DC input power cables for the chassis should be 10 gauge wire and cable lengths should match within 10 percent of deviation.

Each DC input power cable is terminated at the PDU by a cable lug, as shown in the following figure.

Note   DC input power cables must be connected to the PDU terminal studs in the proper positive (+) and negative (–) polarity. In some cases, the DC cable leads are labeled, which is a relatively safe indication of the polarity. However, you must verify the polarity by measuring the voltage between the DC cable leads. When making the measurement, the positive (+) lead and the negative (–) lead must always match the (+) and (–) labels on the power distribution unit.
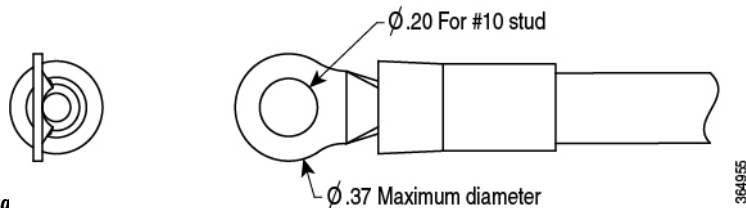

Figure 1: DC Input Power Cable Lug

Note   To avoid hazardous conditions, all exposed conductors must be covered. If after placing the protective cover over the DC terminal block, conductors are exposed, these should be insulated to prevent accidental contact.

Wiring the DC input power source

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.

Procedure

Step 1   Turn off the circuit breaker from the power source.

Step 2   Ensure that the chassis power switch is in the Standby position.

Note
It is not required to place the power switch in the Standby position if you want to hot-swap a single power supply.

Step 3 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the wire.

The wire should be stripped so that it extends into the barrel of the lug without extending out of it. Additionally, the insulation should not be inside the barrel.

Figure 2: DC Power Supply Terminal Block Ground Cable Lugs
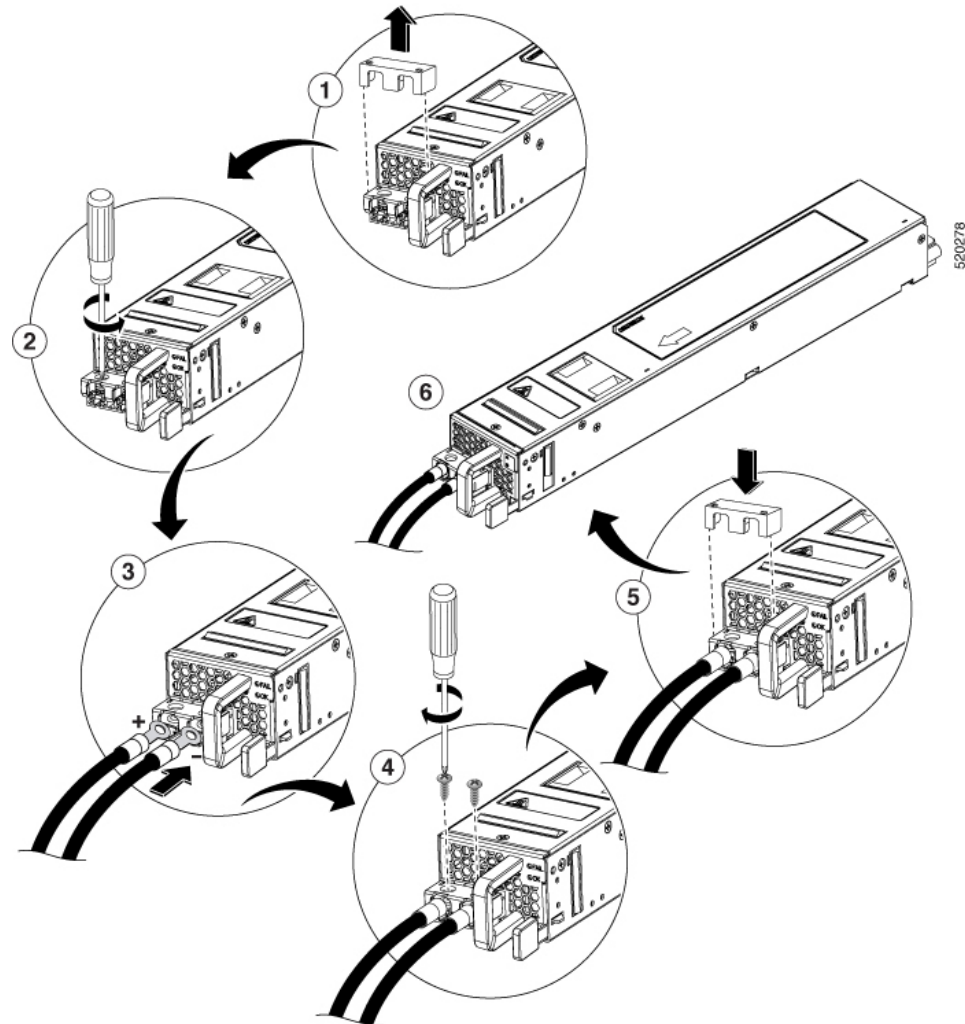
Step 4 Insert the stripped end of the wire into the open end of the lug.

Step 5 Crimp the wire in the barrel of the lug. Verify that the wire is securely attached to the lug.

Step 6 Place the wire against the terminal block, making sure there is solid metal to metal contact.

Step 7 Secure the lugs to the chassis with two M4 screws. Ensure that the lug and the wire will not interfere with other switch hardware or rack equipment.

Step 8 Replace the snap on cover on the terminal block of the DC power supply.

Removing DC power supplies

The DC power supply has a terminal block that is installed into the power supply terminal block header.

Procedure

Step 1	Turn off the circuit breaker from the power source.
Step 2	Ensure that the chassis power switch is in the Standby position.

> **Note**
> It is not required to place the chassis power switch in the Standby position if you want to hot-swap a single power supply.

Step 3	Remove the plastic cover from the terminal block.
Step 4	Unscrew the two terminal block screws on the unit and remove the wires from the power supply.
Step 5	Press the power supply retaining latch towards the pull handle, grasp the handle with one hand, and pull the power supply out of the slot while supporting the weight of the power supply with the other hand.

Removing and replacing USB 3.0 interface

The Cisco 8500 Series Secure Router contain one USB 3.0 interface to store configurations or Cisco IOS XE consolidated packages.

To remove and then replace a USB flash memory stick, follow these steps:

Procedure

Step 1	Pull the flash memory stick from the USB port.
Step 2	To replace a Cisco USB Flash memory stick, insert the module into USB port 1. The Flash memory stick can be inserted or removed regardless of whether the router is powered up or not.

Removing and replacing a DIMM

The Cisco 8500 Series Secure Router has two DIMM slots and supports 16-GB configuration by default.

Table 1: Supported Slots for Inserting the DIMMs

Memory PID Option	Memory Channel B	
	Slot 0 (U1DA0)	Slot 2 (U1DB0)

Memory PID Option	Memory Channel B	
MEM-C85G2-32GB	16 GB	16 GB
MEM-C85G2-64GB	32 GB	32 GB

Removing a DIMM

Before you begin

Perform the following steps before you begin the process of removing and replacing a DIMM from a Cisco 8500 Series Secure Router:

- Use an ESD-preventive wrist strap.

- Back up the data that you want to save.

- Remove the power supplies before you remove the chassis top cover.

Procedure

Step 1   With an ESD wrist strap on, remove the power supplies from the chassis.

Step 2   Remove the chassis top cover by performing the following steps:

a) Remove the nine Torx screws on the top surface of the cover, along with the five Torx screws on each side of the cover, using a Torx T8 driver. Then, remove the remaining three screws on the top surface of the cover with a small Phillips screwdriver.

b) After removing the screws, lift off the chassis cover.

Step 3   Locate the DIMMs on the router.

Figure 3: DIMM Location in Cisco 8500 Series Secure Router
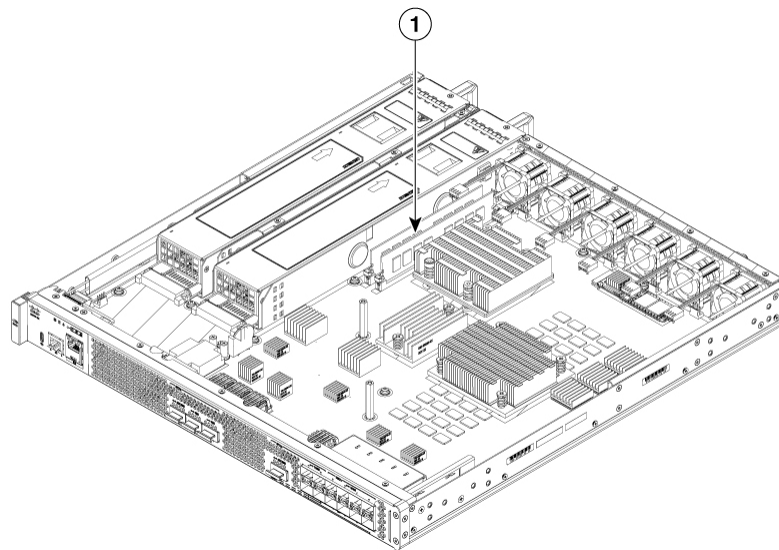
| 1	Cisco 8500 Series Secure Router DIMM location slot

Step 4   Pull down the DIMM module spring latches to release the corresponding DIMM from the socket.

Step 5   When both ends of the DIMM are released from the socket, grasp each end of the DIMM with your thumb and forefinger and pull the DIMM completely out of the socket. Handle only the edges of the DIMM; avoid touching the memory module, pins, and the metal traces (the metal fingers along the connector edge of the DIMM) along the socket edge.

Step 6   Place the DIMM in an antistatic bag to protect it from ESD damage.

Replacing a DIMM

Procedure

Step 1   Place the DIMM on an antistatic mat or pad while wearing an antistatic device, such as a wrist strap.

Caution
DIMMs are sensitive components that can be shorted by mishandling; they are susceptible to ESD damage. Handle the DIMM by the edges only, and avoid touching the pins.

Step 2   Remove the new DIMM from the antistatic bag.

Step 3   Locate the keying notch and align the DIMM with the socket before inserting it.

Step 4   Gently insert the new DIMM, taking care not to damage the pins on the edge of the DIMM. Press the top of the DIMM towards the socket, being careful to apply force only on the DIMM that is parallel with the plane of the DIMM.

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

Figure 4: Installing a DIMM in the Socket
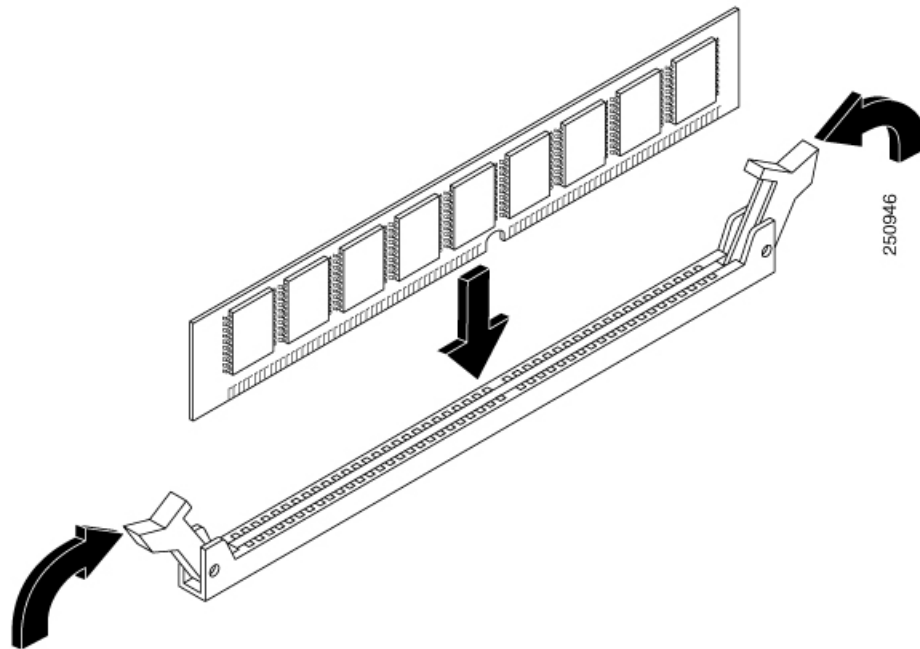
Step 5 After the DIMM is installed, check whether the release levers are flush against the sides of the DIMM socket. If they are not, the DIMM might not be seated properly. If the DIMM appears misaligned, carefully remove it according to the removal procedure and then reseat it in the socket. Push the DIMM firmly back into the socket until the release levers are flush against the sides of the DIMM socket.

Step 6 Replace the chassis top cover. Install the top surface screws, side screws and tighten them slightly

Step 7 Install the power supplies into the chassis and power up the router.

Removing and replacing fans

## Removing the fans for Cisco 8500 Series Secure Routers

Before you begin

Remove the chassis from the rack and place it on a table top to perform this task.

Perform the following steps before you begin the process of removing the fans :

• Use an ESD-preventive wrist strap.

• Back up the data that you want to save.

• Remove the power supplies before you remove the chassis top cover.

Procedure

Step 1   Remove the chassis top cover by performing the following steps:

    a) Remove the twelve top surface screws on the chassis cover.

    b) Remove the five screws from the left side of the chassis and five screws from the right side of the chassis.

    c) Lift the chassis cover. Note, use the screw specified in the Bill of Materials (BOM).

Step 2   Position the chassis so that you have the most comfortable access to the chassis to remove the fans.

    The fans are located at the rear of the chassis.

Step 3   Unplug the six fan connectors from the motherboard.

Step 4   Remove the three screws from the rear of the chassis as shown in the following figure. Note, use the screw specified in the Bill of Materials (BOM).
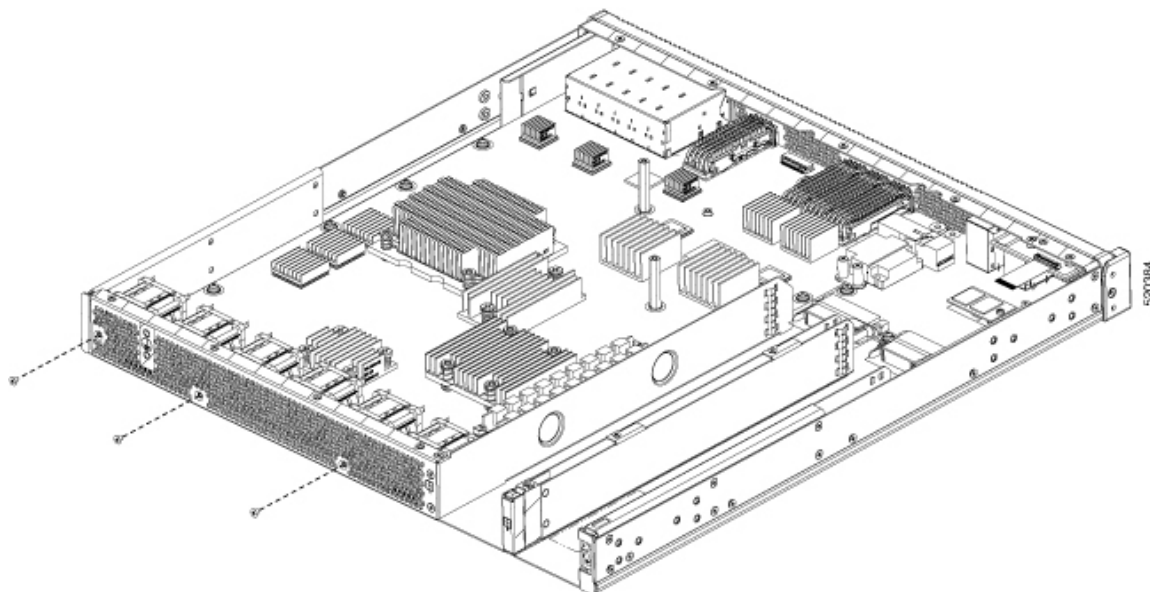
Step 5   Rotate the fan tray slightly rotate the top of the fan tray slightly into the chassis internals, and then lift it out of the chassis.

Step 6   Reverse the order of fan removal to install the new fan tray. Ensure that all fans are connected and all screws for the fan tray and chassis cover are replaced prior to powering up the chassis.
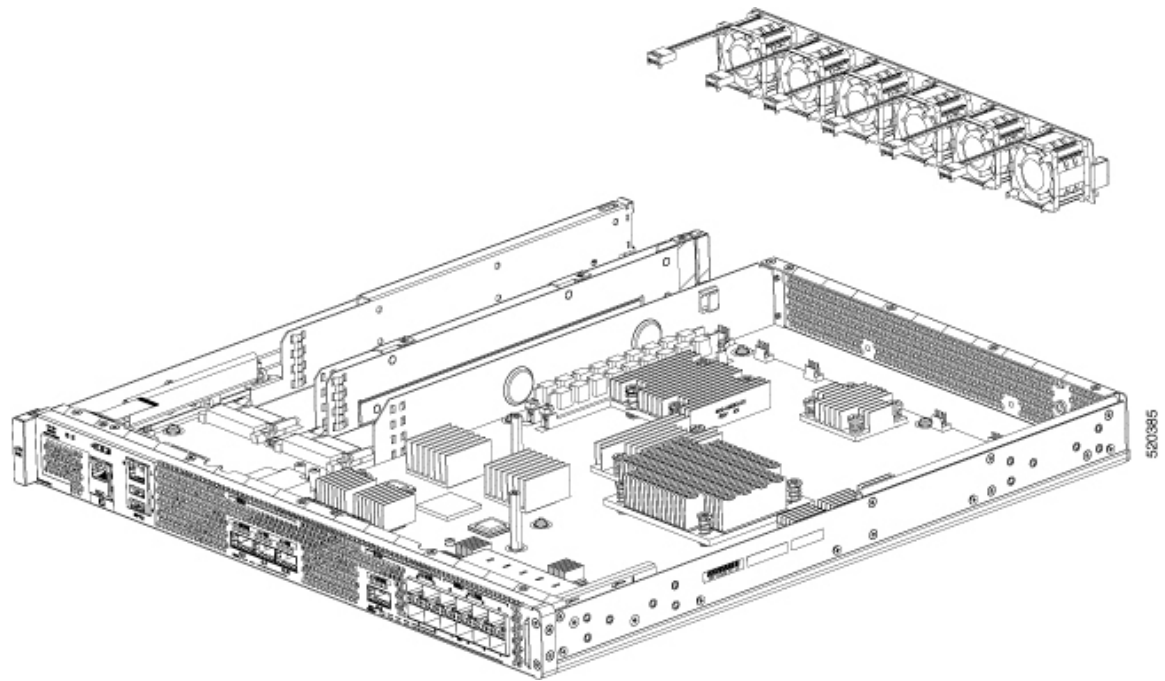
Installing and removing small-form pluggable modules

Install and remove SFP and SFP+ modules

Before you begin

See the Cisco Optics-to-Device Compatibility Matrix for a list of supported SFP and SFP+ modules. Use only supported SFP/SFP+ modules on the platform.

⚠️

Warning   Class 1 laser product. Statement 1008

✏️

Note   We recommend that you wait 30 seconds between removal and insertion of an SFP on an interface module. This time is recommended to allow the transceiver software to initialize and synchronise with the standby RSP. Changing an SFP more quickly could result in transceiver initialization issues that disable the SFP

• Do not remove the dust plugs from the SFP and SFP+ modules or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the module ports and cables from contamination and ambient light.

• Removing and installing an SFP and SFP+ module can shorten its useful life. Do not remove and insert any SFP/SFP+ module more often than is necessary.

- To prevent ESD damage, follow your normal board and component handling procedures when connecting cables to the switch and other devices.

- When you insert several SFP and SFP+ modules in multiple ports, wait for 5 seconds between inserting each SFP/SFP+. This will prevent the ports from going into error disabled mode. Similarly, when you remove an SFP and SFP+ from a port, wait for 5 seconds before reinserting it.

Procedure

Step 1	Attach an ESD-preventive wrist strap to your wrist and to an earth ground surface.
Step 2	Find the send (TX) and receive (RX) markings that identify the top of the SFP/SFP+ module.
	On some SFP/SFP+ modules, the send and receive (TX and RX) markings might be shown by arrows that show the direction of the connection.
Step 3	If the SFP/SFP+ module has a bale-clasp latch, move it to the open, unlocked position.
Step 4	Align the module in front of the slot opening, and push until you feel the connector snap into place.
Step 5	If the module has a bale-clasp latch, close it to lock the SFP/SFP+ module in place.
Step 6	Remove the SFP and SFP+ dust plugs and save.
Step 7	Connect the SFP and SFP+ cables.

Laser safety guidelines

Optical Small-Form Pluggable (SFPs) use a small laser to generate the fiber-optic signal. Keep the optical transmit and receive ports covered whenever a cable is not connected to the port.

Warning   Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051

Warning   Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040

Warning   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. Statement 1255.

To install an SFP module in your device, perform these steps:

Procedure

Step 1   Read the Safety Warnings section and attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector or a bare metal surface on your chassis.

Step 2   Slide the SFP into the device connector until it locks into position

Tip
If the SFP uses a bale-clasp latch (see Laser Safety Guidelines section, the handle should be on top of the SFP module.

Figure 5: Install a Small-Form Pluggable Module
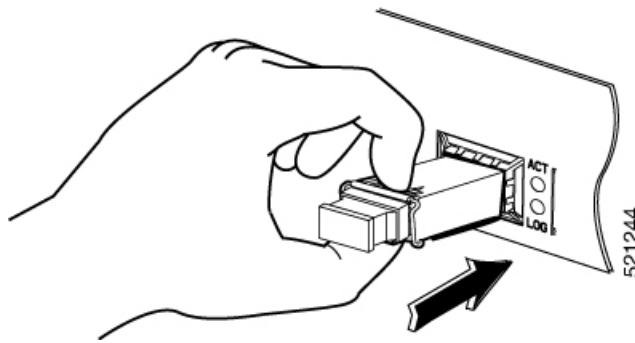
Caution
Do not remove the optical port plugs from the SFP until you are ready to connect cabling.

Step 3   Connect the network cable to the SFP module.

Remove small form pluggable modules

Follow these steps to remove a Small Form Pluggable (SFP) from the device:

Procedure

Step 1   Read the Safety Warnings section and disconnect the power supply before you perform any module replacement.

Step 2   Disconnect all cables from the SFP.

Warning
Statement 1051—Laser Radiation

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

Caution
The latching mechanism used on many SFPs locks the SFP into place when cables are connected. Do not pull on the cabling in an attempt to remove the SFP.

Step 3   Disconnect the SFP latch.

Note

SFP modules use various latch designs to secure the module in the SFP port. Latch designs are not linked to SFP model or technology type. For information on the SFP technology type and model, see the label on the side of the SFP.

Figure 6: Disconnecting SFP Latch Mechanisms
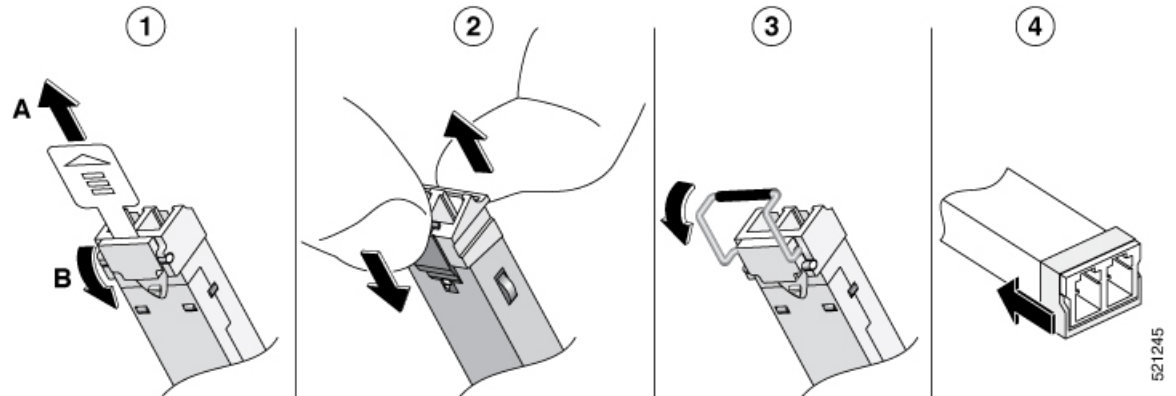
1	Sliding latch	3	Bale-clasp latch
2	Swing and slide latch	4	Plastic collar latch

Tip

Use a pen, screwdriver, or other small straight tool to gently release a bale-clasp handle if you cannot reach it with your fingers.

Step 4   Grasp the SFP on both sides and remove it from the device.

Repacking the router

If your system is damaged, you must repack it for return shipment.

Before you return the router or move the router to a different location, repack the system using the original packaging material.