



CHAPTER 5

Maintaining the Router

This chapter contains safety at the field replaceable unit (FRU) level, removal and replacement instructions for FRUs and procedures to troubleshoot the FRUs.

Your Cisco XR 12404 Router is equipped as ordered and is ready for installation and startup when it leaves the factory. After you install and configure the router, you may need to perform other procedures to ensure that the router continues to operate properly. Also, as your networking requirements change, you may need to upgrade your system by adding or changing components.

Before performing the procedures in this chapter, be sure to review the safety information in the [“Laser Safety” section on page 2-6](#), and the [“Lifting Guidelines” section on page 2-6](#).

You should also be familiar with the *Regulatory Compliance and Safety Information for the Cisco 12000 Series Router* document (78-4347-19) that came with the router.



Caution

All procedures in this chapter assume that you are wearing and ESD-preventative wrist strap. Refer to [“Preventing Electrostatic Discharge Damage” section on page 2-4](#) for additional information.

The following sections describe tools and procedures necessary to maintain the Cisco XR 12404 Router.

- [Tools and Equipment, page 5-2](#)
- [Powering Off the Router, page 5-3](#)
- [Removing and Installing the Front Cover, page 5-4](#)

- [Removing and Replacing the Air Filter, page 5-8](#)
- [Removing and Replacing the Fan Tray Assembly, page 5-11](#)
- [Removing and Replacing an AC Power Entry Module, page 5-14](#)
- [Removing and Replacing a DC Power Entry Module, page 5-17](#)
- [Removing and Replacing a DC PDU, page 5-21](#)
- [Removing and Replacing an RP or Line Card, page 5-29](#)
- [Removing and Replacing a Consolidated Switch Fabric Card, page 5-36](#)
- [Upgrading the RP and Line Card Memory, page 5-38](#)

Tools and Equipment

The following section lists tools and equipment for unpacking, performing maintenance, and setting up your Cisco XR 12404 Router.

- ESD-preventive strap
- 3/16-inch flat-blade screwdrivers
- 1/4-inch flat-blade screwdrivers
- 9/15-inch (14-mm) wrench
- 3/4-inch (19-mm) socket and ratchet wrench
- 2-mm allen wrench
- Vacuum cleaner
- Antistatic bag (or similar ESD-preventive container)
- Number 2 Phillips screwdriver

Powering Off the Router

Unless otherwise noted, the maintenance tasks described in this chapter can be performed while the router remains powered on. Most Cisco XR 12404 Router field replaceable units (FRUs) support online insertion and removal (OIR), which means they can be removed and installed (hot-swapped) while the router remains powered on.

- Line cards and the fan tray assembly are hot-swappable.
- PEMs and RPs also support OIR, but are hot-swappable only when the system is equipped with two PEMs or two RPs, respectively.
- The power distribution unit (PDU) and CSF card do not support OIR.

Use the following procedure to power off an AC- or a DC-powered router.

-
- Step 1** Turn off the power switches (AC) or circuit breaker switches (DC) on the PEMs.
- Step 2** Turn off the facility circuit breakers for power source lines connected to the PDU.
- Step 3** When the procedure requires that the router be disconnected from source power:
- AC-powered systems—Unplug the AC power cords from the power outlets.
 - DC-powered systems—Disconnect and remove the source DC wires from the power connector blocks on the PDU.
- Step 4** Verify the following conditions:
- LEDs on the PEMs are off.
 - LEDs on the RP, all line cards, and CSF are off.
 - The fans in the fan module tray are off.

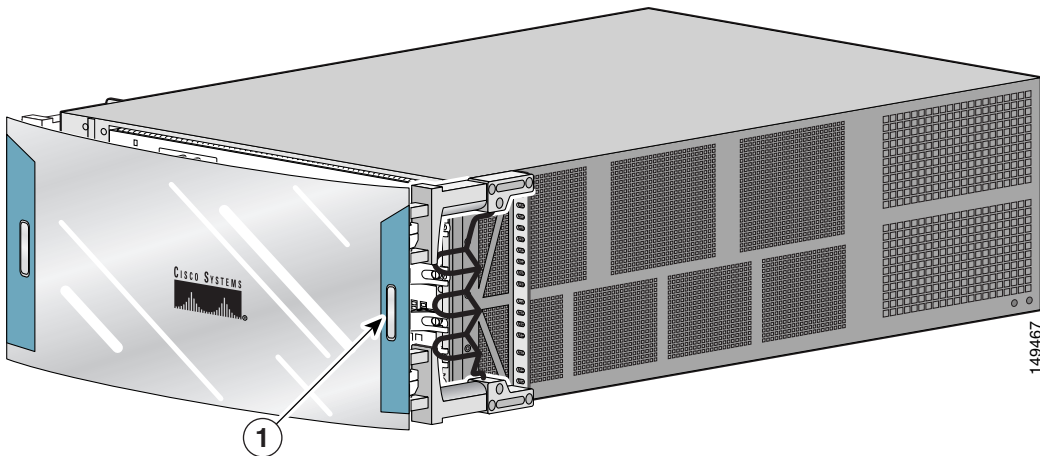
Removing and Installing the Front Cover

This section describes how to change the front cover to open from left-to-right by installing the hinge on the opposite side.

Use the following procedure to change the location of the hinge.

-
- Step 1** Open the front cover by pressing the right latch button (Figure 5-1).

Figure 5-1 Opening the Front Cover



-
- | | |
|---|-------------------|
| 1 | Front Cover Latch |
|---|-------------------|
-

- Step 2** Remove the front cover by lifting the (top and bottom) hinge pins to free the cover from the chassis (Figure 5-2).

**Caution**

Make sure you are holding the front cover securely so it does not drop when you release it from the chassis.

- Step 3** Reinstall the hinge pins into the chassis hinge brackets.

Figure 5-2 Removing or Installing Hinge Pins

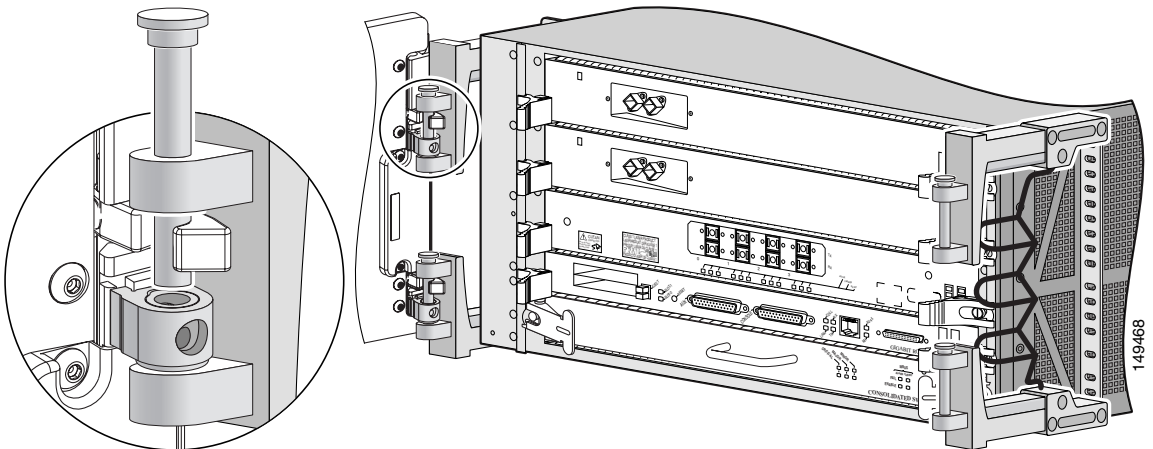
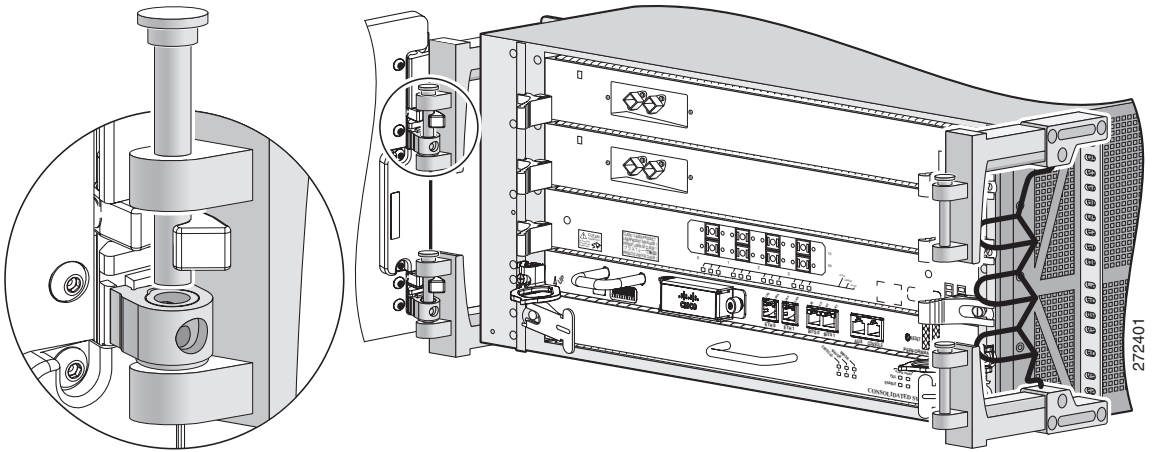
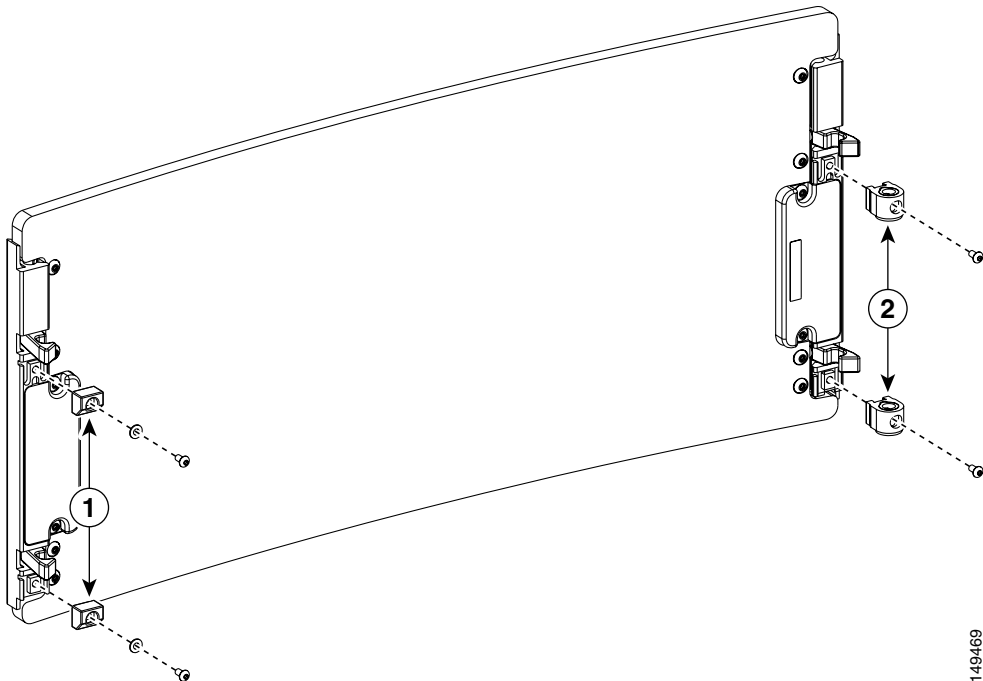


Figure 5-3 *Removing or Installing Hinge Pins (with PRP-3 installed)*

Step 4 Remove the bumpers and pivot blocks from the cover as shown in [Figure 5-4](#).

Figure 5-4 *Removing the Bumpers and Pivot Blocks*



1	Bumpers	2	Pivot Blocks
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Step 5 Reinstall the hardware to the opposite sides of the front cover:

- Mount pivot blocks to the left side and tighten the screws until snug.
- Mount the bumpers to the right side and tighten the screws until snug.

- Step 6** Attach the front cover to the chassis:
- Remove the hinge pins from the hinges on the right side of the chassis.
 - Align the pivot blocks on the front cover with the hinges on the right side of the chassis and install the hinge pins to hold the cover in place (see [Figure 5-2](#)).
 - Close the front cover by pressing the latch button allowing the cover latch to engage with the hinge pins on the chassis.
-

Removing and Replacing the Air Filter

The Cisco XR 12404 Router is equipped with a user-serviceable air filter that removes dust drawn into the router by the fan assembly tray. You should examine the air filter once a month (or more often in dusty environments). If the filter appears dirty, you can either vacuum or replace it. If the filter appears worn or torn, dispose of it in a responsible manner and install a replacement air filter.



Caution

A damaged air filter can restrict the airflow, cause an overtemperature condition in the router and degrade EMI performance.

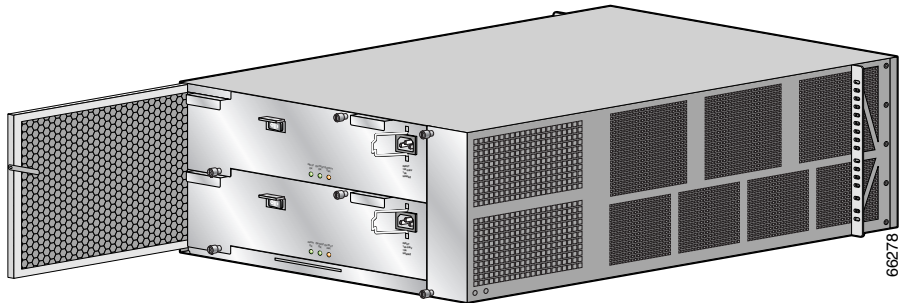
Use the following procedure to clean or replace the air filters.

- Step 1** Grasp the small tab on the edge of the air filter and pull the tab to remove the air filter from the chassis (Figure 5-5).

**Tip**

If you are unable to lift the tab on the edge of the air filter, use a flat-blade screwdriver to lift the tab, then grasp it.

Figure 5-5 Cisco XR 12404 Router Air Filter Location



- Step 2** Visually check the condition of the air filter.
- If the filter appears dirty, you can either vacuum or replace it.

**Caution**

Do not vacuum the air filter while it is installed in the housing.

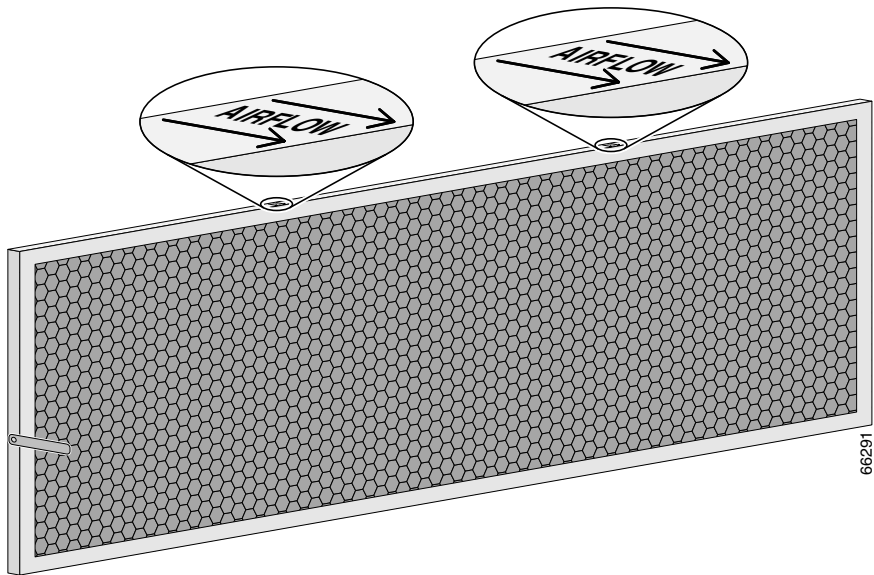
- If the filter appears worn or torn, dispose of it in a responsible manner and install a replacement air filter.

- Step 3** Reinstall the air filter into the chassis noting the direction of the airflow arrows on the top of the air filter frame (Figure 5-6).

**Caution**

The arrows located on the edge of each air filter frame that indicate the direction of *air flow*. Always install the air filter with the arrow pointing in toward the RP and line card cage.

Figure 5-6 Cisco XR 12404 Router Air Filter Direction of Air Flow



Removing and Replacing the Fan Tray Assembly

Use the following procedure to remove and replace the fan tray assembly.

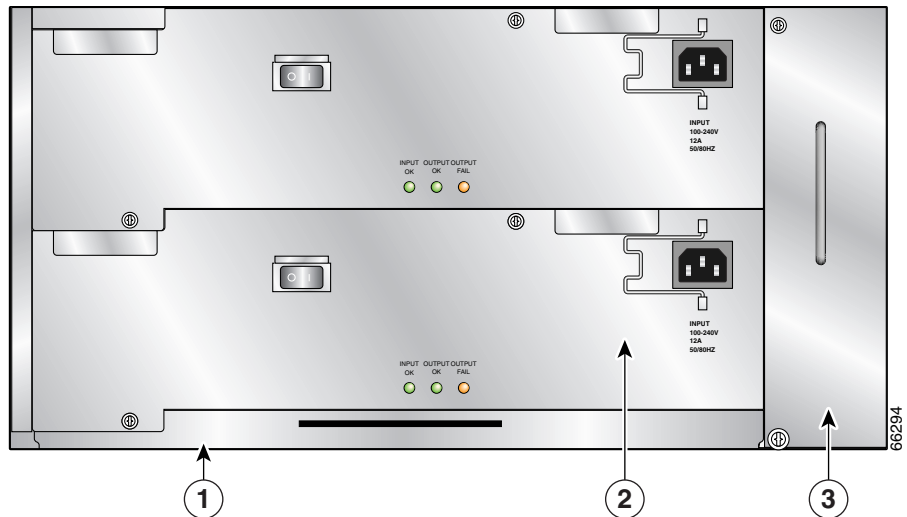
**Caution**

Although the fan tray assembly supports OIR and can be replaced without interruption to system operation, do not operate the system without the fan tray assembly for more than a few minutes to prevent overheating.

Step 1

Loosen the two captive screws on the fan tray assembly (item 3 in [Figure 5-7](#)).

Figure 5-7 Cisco XR 12404 Router Fan Tray Assembly Location

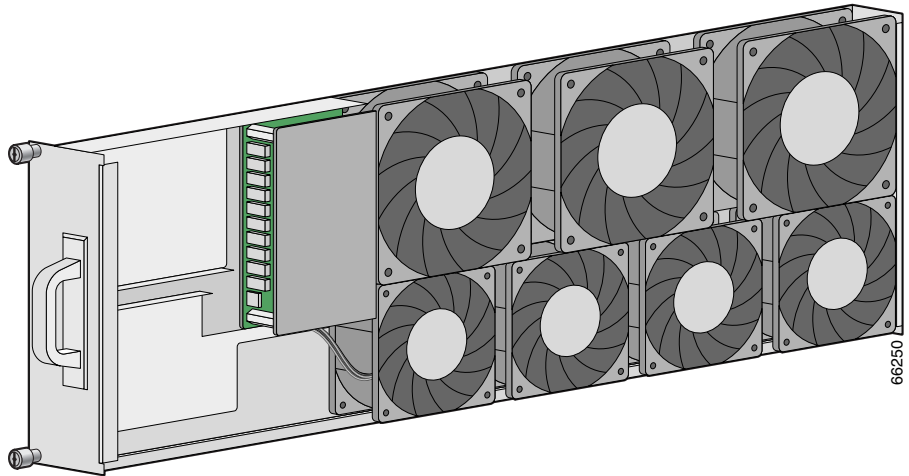


1	Chassis	3	Fan tray assembly
2	AC PEM		

Removing and Replacing the Fan Tray Assembly

- Step 2** Grasp the handle and pull the fan tray assembly out of the chassis ([Figure 5-8](#)).
- Support the bottom of the assembly with your other hand when removing the fan tray.
 - Electrical connection for the fans are automatically disconnected when the fan tray is removed from the housing.

Figure 5-8 Cisco XR 12404 Router Fan Tray Assembly



- Step 3** Hold the replacement fan tray assembly with both hands and insert the connector end of the fan tray into the chassis.



Caution

The fan tray is designed to install only one way. Do not use excessive force when installing the fan tray assembly.

- Step 4** Tighten the two captive screws on the fan tray assembly.
- See the [“Troubleshooting the Fan Tray Assembly Installation”](#) section on [page 5-13](#) if the fan tray assembly is not operating properly after installation.

Troubleshooting the Fan Tray Assembly Installation

Use the following procedure to troubleshoot the fan tray assembly if it is not operating properly after installation.

**Caution**

To prevent overheating, do not operate the system without the fan tray assembly operational for more than a few minutes.

-
- Step 1** Make sure the router is powered on and that all power cords are connected properly.
- Step 2** Loosen the captive screws and reseal the fan tray assembly.
- Tighten the captive screws to secure the fan tray assembly to the chassis.
- Step 3** If after several attempts to reseal the fan tray assembly, replace the existing fan tray assembly with a spare.
- If the spare fan tray assembly also fails, power off the router and contact a Cisco service representative for assistance.
-

Removing and Replacing an AC Power Entry Module

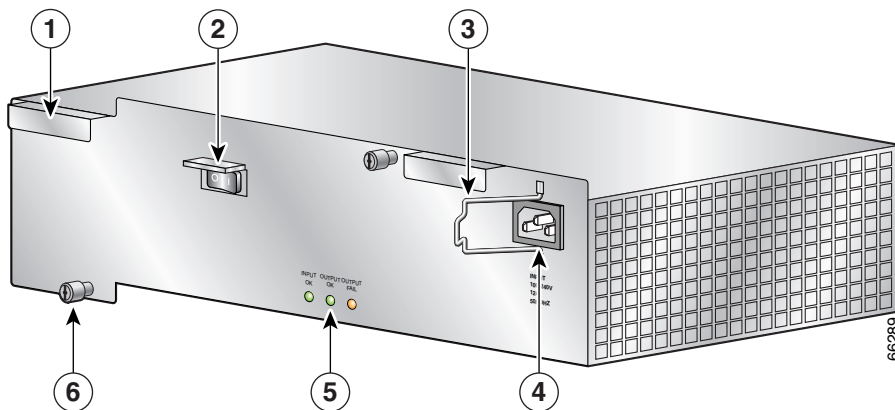
Although an AC PEM supports OIR, in order to maintain operational redundancy, proper cooling, and meet EMI compliance standards, you must have both working power supplies installed. When you remove a failed power supply with the router in operation, perform the replacement as quickly as possible. Make sure you have the tools and the replacement power supply ready before beginning the removal and installation procedure.

Refer to [Figure 5-9](#) and use the following procedure to remove and replace an AC PEM.

-
- Step 1** Power off the faulty PEM.
 - Step 2** Unplug the power supply cord from its AC outlet.
 - Step 3** Power off the circuit breaker assigned to that AC outlet.
 - Step 4** Release the bail latch and unplug the power cord from its receptacle.
 - Step 5** Loosen the two captive screws that secure the PEM to the chassis.
 - Step 6** Remove the PEM from the chassis using the finger grips to pull it out.

**Warning**

An AC PEM weighs approximately 11.0 lbs. (4.98 kg.). Use both hands to remove it from the chassis.

Figure 5-9 AC PEM Components

1	AC PEM finger grips	4	Power cord receptacle
2	On/Off switch	5	Status LEDs
3	Bail latch	6	Captive screws

**Tip**

If you plan to return the defective PEM to the factory, repackage it in the shipping container you received with the replacement PEM.

- Step 7** Slide the replacement PEM into the bay until it is seated to the backplane connector.

**Note**

Make sure the power switch is in the off (0) position.

- Step 8** Tighten the two captive screws to secure the PEM to the chassis.
Electrical connections between the PEM the backplane connector are made automatically when the PEM is fully seated and the captive screws are tightened.
- Step 9** Connect the power cord into the receptacle and place the bail latch over the power cord to secure it in place.
- Step 10** Plug the power cord into its AC outlet.

Step 11 Power on the circuit breaker assigned to that AC outlet.

Step 12 Power on the PEM.

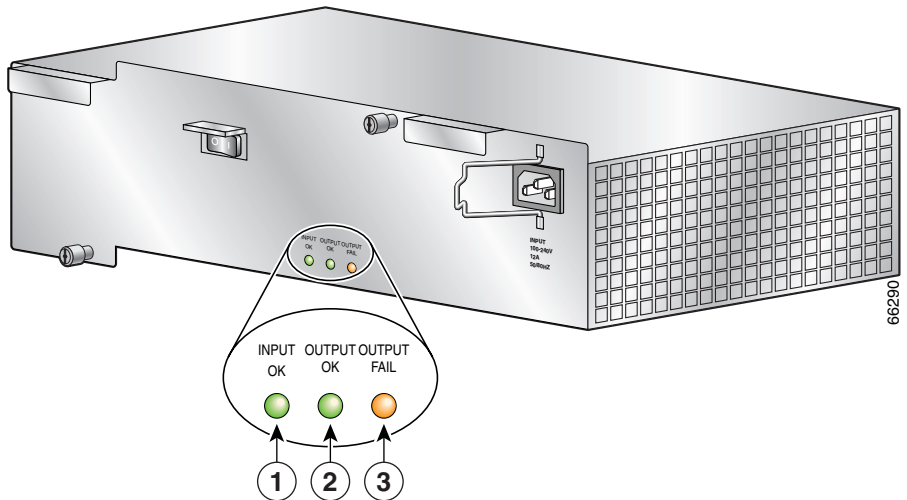
- The green Input OK and Output OK LEDs should be on.
- The amber Output Fail LED should be off.

See the [“Troubleshooting an AC PEM Installation”](#) section on page 5-16 if the PEM does not power on correctly.

Troubleshooting an AC PEM Installation

Refer to [Figure 5-10](#) and use the following procedure to troubleshoot the PEM installation.

Figure 5-10 AC PEM Status LEDs



1	Input OK	Green On	The PEM is powered on and operating correctly.
2	Output OK	Green On	The AC power source is present and operating within the specified limit.
3	Output Fail	Amber On	The PEM detects a fault condition causing it to shutdown.

- Step 1** If the Input OK and Output OK LEDs are off, or if the Output Fail LED is on, make sure that the:
- PEM is firmly seated in the bay and the captive screws are tightened securely.
 - AC power source circuit breaker is switched on.
 - Power cord is firmly plugged into the AC power source receptacle.
 - Power cord is firmly plugged into the PEM and the bail latch is secure over the plug.
 - Power switch is set to the on (1) position.
- Step 2** If the problem still exists after checking the items in Step 1, replace the PEM.
- If replacing the PEM does not correct the problem, contact a Cisco service representative for assistance.

Removing and Replacing a DC Power Entry Module

Although a DC PEM supports OIR, in order to maintain operational redundancy, proper cooling, and meet EMI compliance standards, you must have both working power supplies installed. When you remove a failed power supply with the router in operation, perform the replacement as quickly as possible. Make sure you have the tools and the replacement power supply ready before beginning the removal and installation procedure.

Refer to [Figure 5-11](#) and use the following procedure to remove and replace a DC PEM.

Removing and Replacing a DC Power Entry Module

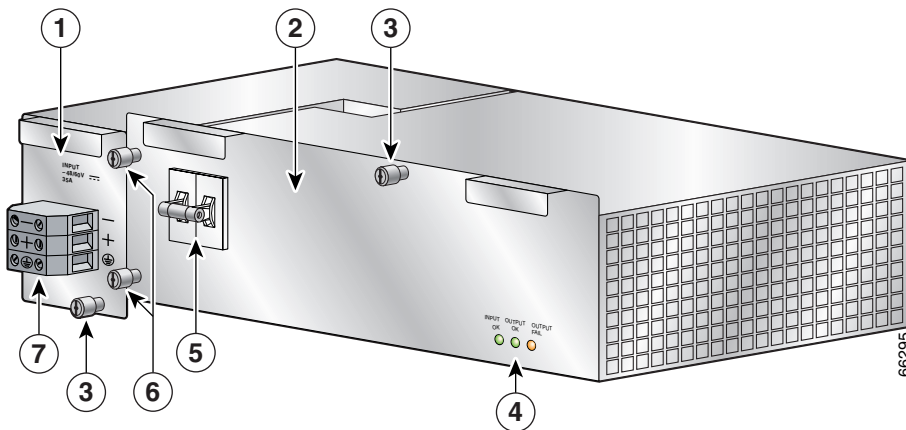
- Step 1** Power off the faulty PEM.
- Step 2** Power off the circuit breaker assigned to the DC power source.
- Step 3** Loosen the three captive screws that secure the PEM to the chassis.
- Step 4** Remove the PEM from the chassis using the finger grips to pull it out.



Warning

A DC PEM weighs approximately 11.0 lbs. (4.98 kg.). Use both hands to remove it from the chassis.

Figure 5-11 DC PEM and PDU Components



1	DC PDU	5	On/Off switch
2	DC PEM	6	PDU captive screws
3	PEM captive screws	7	PDU terminal block
4	Status LEDs		



Tip

If you plan to return the defective PEM to the factory, repackage it in the shipping container you received with the replacement PEM.

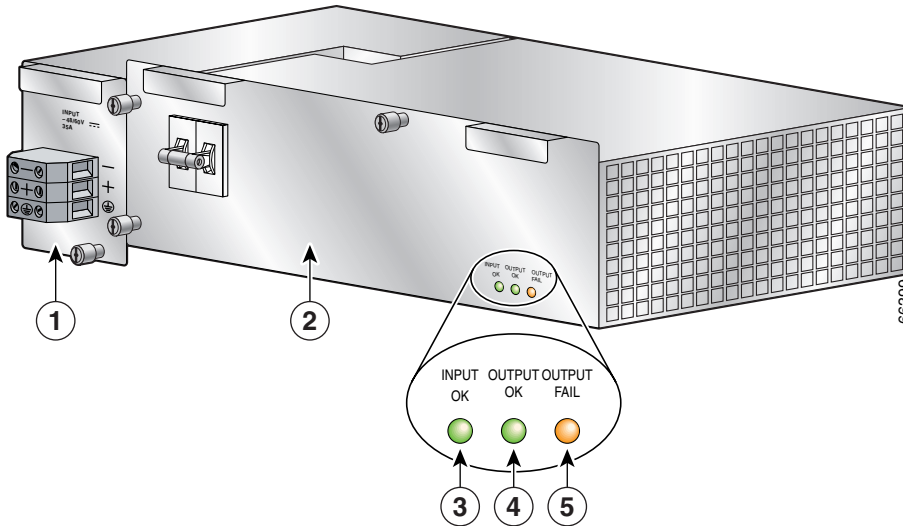
- Step 5** Slide the replacement PEM into the bay until it is seated to the backplane connector.
- Make sure the power switch is in the off (0) position.
- Step 6** Tighten the three captive screws to secure the PEM to the chassis.
- Electrical connections between the PEM the backplane connector are made automatically when the PEM is fully seated and the captive screws are tightened.
- Step 7** Power on the circuit breaker assigned to the DC source power.
- Step 8** Power on the PEM.
- The green Input OK and Output OK LEDs are on.
 - The amber Output Fail LED is off.

See the [“Troubleshooting the DC PEM Installation”](#) section on page 5-20 if the PEM does not power on correctly.

Troubleshooting the DC PEM Installation

Refer to [Figure 5-12](#) and use the following procedure to troubleshoot the PEM installation.

Figure 5-12 DC PEM Status LEDs



1	DC PDU		
2	DC PEM		
3	Input OK (Green)	On	DC PEM is operating normally in a power-on condition
4	Output OK (Green)	On	DC power source is present and within specified limit
5	Output Fail (Amber)	On	PEM is operating in a fault condition and shutdown has occurred

-
- Step 1** Make sure the power supply is seated properly:
- Eject and reseal the power supply. Make sure that the:
 - Captive screw on the ejector lever are tightened securely.
 - Power switch is set to the on (1) position.
- Step 2** If the Input OK and Output OK LEDs are off, or if the Output Fail LED is on, make sure that the:
- Power switch is set to the on (1) position.
 - Power leads are securely connected to the power connector block on the PDU.
 - Power cables are securely connected at the DC source connection.
 - The source DC circuit breaker is turned on.
- Step 3** If the problem still exists, replace the PEM.
- If replacing the PEM does not correct the problem, contact a Cisco service representative for assistance.
-

Removing and Replacing a DC PDU

The DC PDU does *not* support online insertion and removal (OIR) and cannot be replaced while the system is operating. You must power off the router before replacing the PDU.



Caution

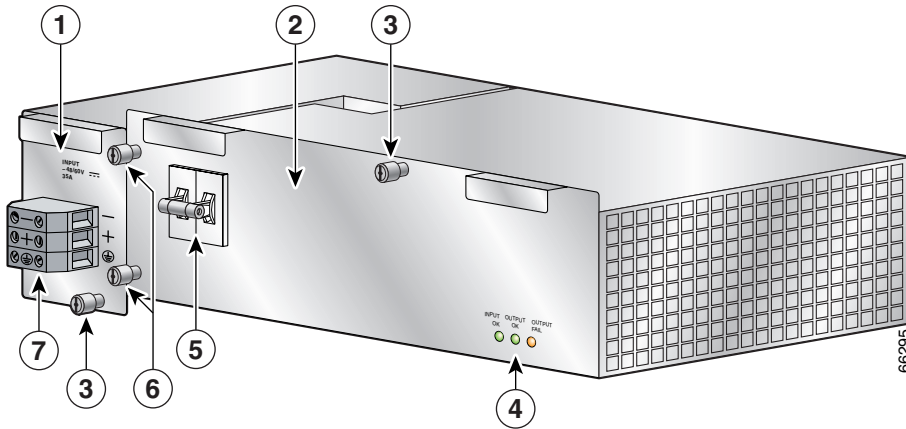
To remove and replace the DC PDU, the system must be powered off. Notify the network administrator and other appropriate personnel that all routing traffic stops while the PDU is replaced.

Use the following procedure to remove and replace a DC PDU.

Removing and Replacing a DC PDU

Step 1 Power off *both* PEMs (item 5 in [Figure 5-13](#)).

Figure 5-13 DC PEM and PDU Components



1	DC PDU	5	On/Off switch
2	DC PEM	6	PDU captive screws
3	PEM captive screws	7	PDU terminal block
4	Status LEDs		

Step 2 Power off the circuit breakers assigned to the DC power source.

- Step 3** Loosen the terminal block screws to disconnect the positive, negative, and ground wires from the DC PDU terminal block of the faulty PEM (Figure 5-14).

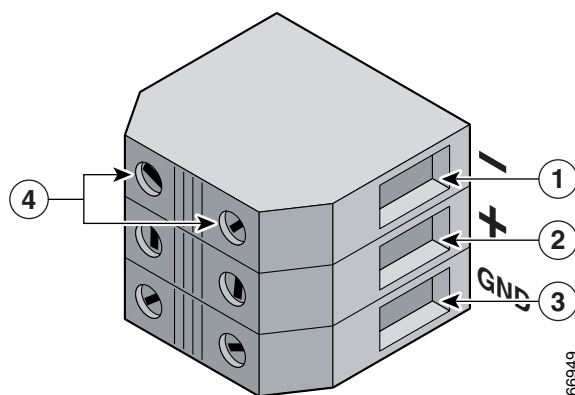
**Warning**

To prevent injury and damage to the equipment, always remove the source DC power leads and ground from the power shelf terminals in the following order: (a) negative (-), (b) positive (+), (c) ground.

**Caution**

Before removing wires, be sure to note the color for each type of wire (positive, negative, and ground). Because there is no color code standard for source DC wiring, you must be sure which power wires are connected to the proper positive (+) and negative (-) terminal ports. Typically, green (or green and yellow) indicate a ground wire, while power wire leads may be labeled positive (+) or negative (-). Because this is not always the case, the safest way to indicate the polarity of a wire is to note its color and identify it as described in this procedure.

Figure 5-14 DC PDU Terminal Block



1	Negative port	3	Ground port
2	Positive port	4	Terminal port connector screws

Removing and Replacing a DC PDU

Step 4 Loosen the captive screws securing the PDU and the PEM to the chassis (see item 6 in [Figure 5-13](#)).

Step 5 Remove the PDU/PEM from the chassis using the finger grips to pull it out.



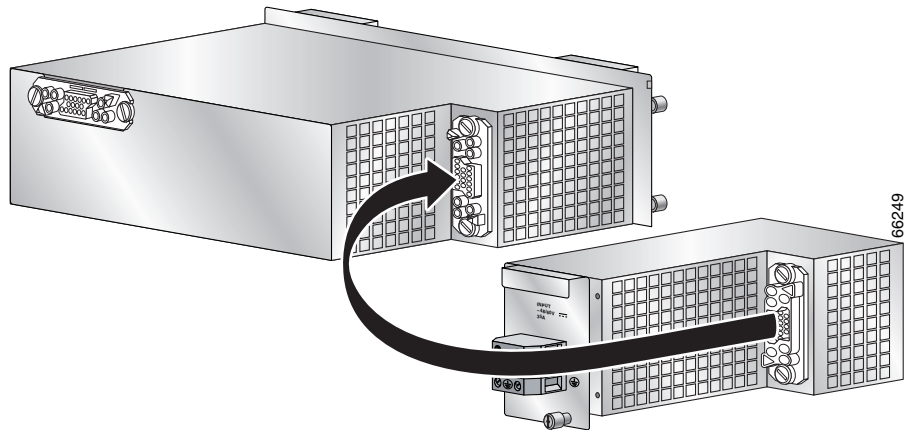
Warning

A DC PEM and PDU weigh more than 11.0 lbs. (4.98 kg.). Use both hands to remove it from the chassis.

Step 6 Disconnect the PDU from the PEM.

Step 7 Connect the new PDU to the PEM ([Figure 5-15](#)).

Figure 5-15 Connector for DC PEM and DC PDU—DC PEM Rear View



Step 8 Slide the PDU/PEM into the bay until the PEM is seated to the backplane connector. Make sure the power switch is in the off (0) position.

Step 9 Tighten the captive screws to secure the PDU and PEM to the chassis.

Electrical connections between the PEM the backplane connector are made automatically when the PEM is fully seated and the captive screws are tightened.

- Step 10** Connect the ground, positive, and negative wires to the PDU terminal block in the following order ([Figure 5-16](#)):
- Ground lead to the bottom port.
 - Positive lead to the middle port.
 - Negative lead to the top port.
 - Repeat these steps for the second power connector block.

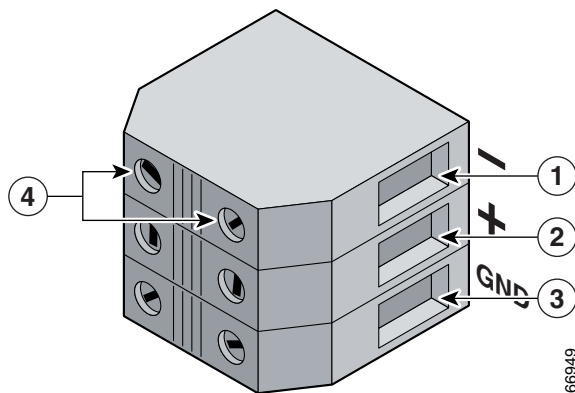
**Warning**

To prevent injury and damage to the equipment, always attach the ground and source DC power leads to the power block connector in the following order: (a) ground to ground, (b) positive (+) to positive (+), (c) negative (-) to negative (-).

**Caution**

Be sure to connect the wires according to the color coding notes and labels you made in [Step 3](#).

Figure 5-16 DC PDU Terminal Block



1	Negative port	3	Ground port
2	Positive port	4	Terminal port connector screws

Step 11 Power on the circuit breakers assigned to the DC power source.

Step 12 Power on *both* PEMs.

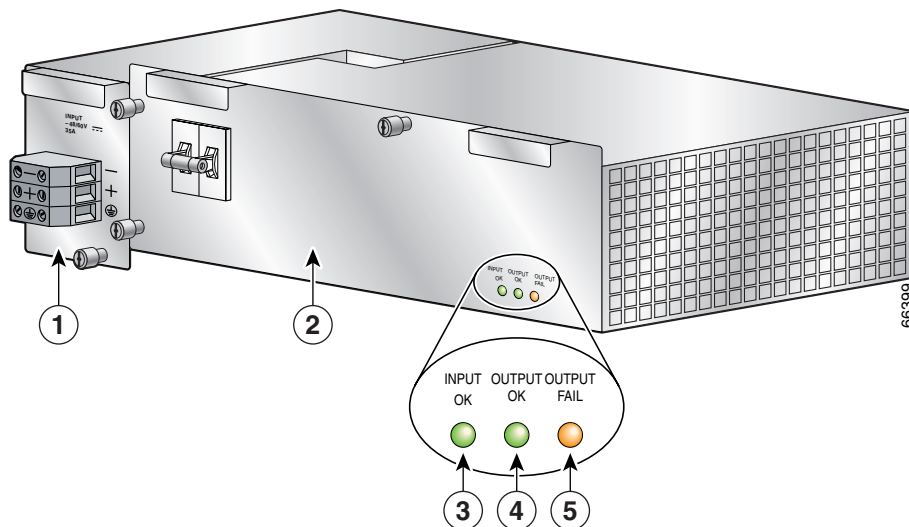
- The green Input OK and Output OK LEDs should be on.
- The amber Output Fail LED should be off.

See the [“Troubleshooting the DC PDU Installation” section on page 5-27](#) if the PEM does not power on correctly.

Troubleshooting the DC PDU Installation

Refer to [Figure 5-17](#) and use the following procedure to troubleshoot the PDU installation.

Figure 5-17 DC PDU, PEM, and Status LEDs



1	DC PDU		
2	DC PEM		
3	Input OK (Green)	On	DC PEM is operating normally in a power-on condition
4	Output OK (Green)	On	DC power source is present and within specified limit
5	Output Fail (Amber)	On	PEM is operating in a fault condition and shutdown has occurred

-
- Step 1** If the Input OK and Output OK LEDs are off, or if the Output Fail LED is on, check that the:
- PEM is firmly seated in the bay and the captive screws are tightened securely.
 - DC power source circuit breakers are switched on.
 - DC power cables are securely attached to the PDU terminal block.
 - Power switch is set to the on (1) position.
- Step 2** If the problem still exists after checking the items in Step 1, replace the PEM.
- Step 3** If replacing the PEM does not correct the problem, contact a Cisco service representative for assistance.
-

Removing and Replacing an RP or Line Card

Line cards can occupy any slot, zero (0) through 3 in the RP and line card cage. The Cisco XR 12404 Router is configured with the RP in slot 0 (Figure 5-18). Redundant RPs can be placed in any slot, but requires a line card spacer to comply with EMI emission standards.

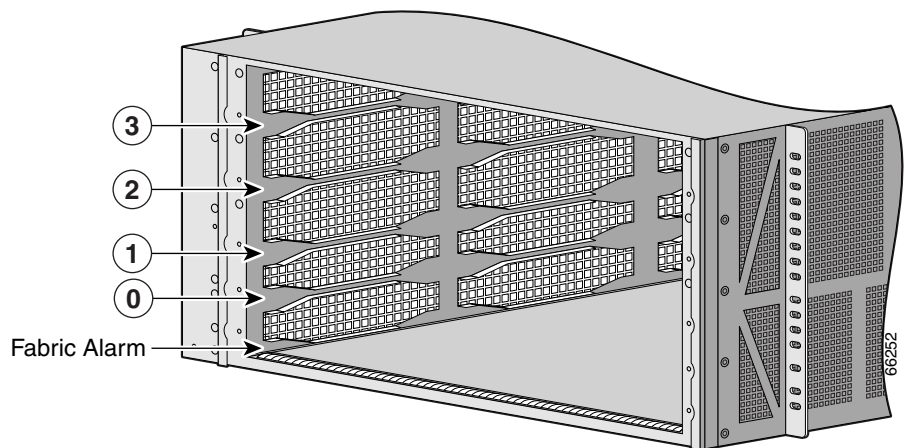
**Note**

Installing a card in slot 1 when all other slots are filled may require additional effort to properly seat the card. Because of the tight fit you have to either apply extra pressure to properly seat the card, or you can remove the card in slot 2 before installing the card in slot 1. After you install the card in slot 1 you can reinstall the card in slot 2.

Cisco XR 12404 Router line cards support OIR, so they can be removed and installed while the router remains powered on. RPs also support OIR, but are hot-swappable only when the system is equipped with two RPs.

Additional line card information can be found in the respective installation and configuration documentation for each type of line card.

Figure 5-18 CSF Location and RP and Line Card Slot Numbers



- Step 1** Identify the RP or line card to be replaced and write down the following information:
- The RP cable connections on the RP.
 - The number and type of RP or line card, so that you will know the location of the card when you re-install it or the replacement, in the card cage.
 - The network interface cable connection ports, on the RP or line card.
- Step 2** On RPs and line cards with multiple ports, start with the left port on the card and disconnect the interface cable connectors from each of the ports.
- Step 3** After all of the interface cables are disconnected, loosen the two captive screws on the cable-management bracket and pull the bracket away from the card.
- Step 4** Loosen the two ejector lever captive screws at each end of the card faceplate.
- Step 5** Simultaneously pivot the ejector levers away from each other to unseat the card from the backplane connector ([Figure 5-19](#)).

Figure 5-19 *Removing an RP or Line Card from the Card Cage*

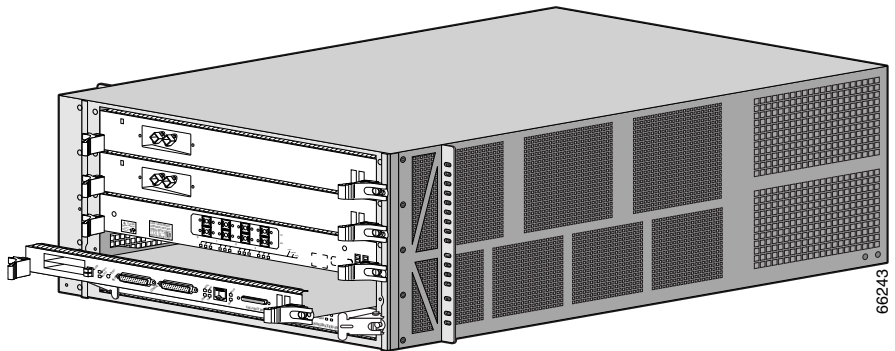
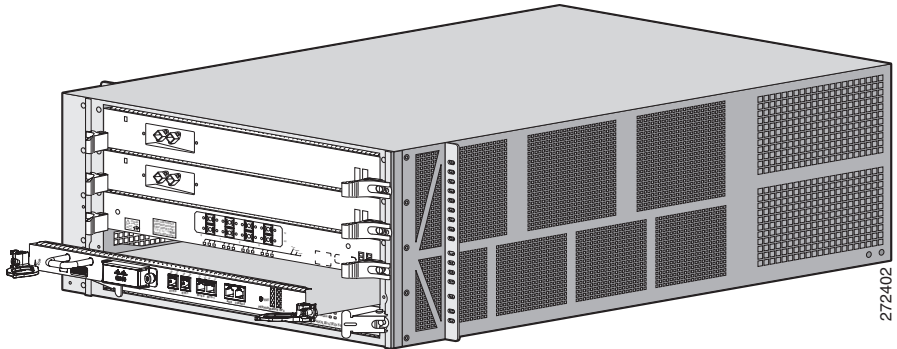


Figure 5-20 Removing a PRP-3 or Line card from the Card Cage



- Step 6** Grasp the edges of the card carrier with both hand to support it and remove the card.



Caution

Remove each RP or line card completely from the slots. A card left partially inserted into the slot can damage the EMI shielding on card in the slot directly below.

- Immediately place the RP or line card in an antistatic bag to protect it against ESD and to prevent dust from getting to the fiber-optic connectors on fiber-optic line cards.
- If you plan to return the defective unit to the factory, repackage it in the shipping container you received with the replacement RP or line card.

- Step 7** Remove the RP or line card from its shipping package and antistatic bag.



Caution

Handle the RPs and line cards by the metal card carrier edges only; avoid touching the board itself or any connector pins.

- Step 8** Seat the RP or line card:

- a. Set both edges of the RP or line card into the card slot and partially slide the card into the chassis.
- b. Pivot the ejector levers away from each other by rotating each ejector lever outward away from the faceplate.

- c. Continue sliding the card into the slot until the ejector levers make contact with the front of the card cage, then *stop*.
- d. Seat the card by grasping each ejector levers and simultaneously pivot them toward the card faceplate.



Note The line card does not boot properly if not fully seated.

Step 9 Tighten the captive screws on the card.



Note The card captive screws must be tightened to meet EMI specification standards.

Repeat Step 1 through Step 9 for any additional replacement RPs or line cards, and then proceed to the next section.

Attaching the Cable-Management Bracket and Connecting Cables

The Cisco XR 12404 Router line cards use cable-management brackets to:

- Organizing the network interface cables
- Keeping the network interface cables out of the way
- Positioning connectors at their respective ports on the line card faceplate
- Keeping the cables free of sharp bends (excessive bending in a network interface cable can cause performance degradation)

When you install a new RP or line card, you need to attach the line card cable-management bracket to the faceplate of the card before connecting the cables. The type of cable-management bracket used by a line card is determined by the card type and the number of network interface ports it has.

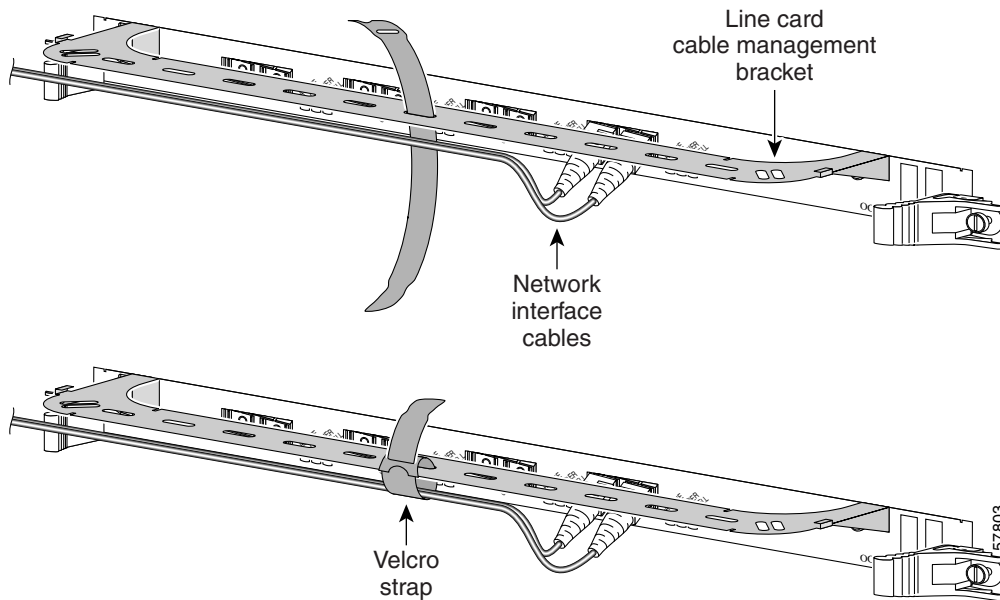
Use the following procedure to attach the cable-management bracket and cables to a line card.

-
- Step 1** Orient the top of the cable-management bracket with the top of the line card faceplate (the end opposite the two four-character alphanumeric displays.)
- Step 2** Align the two captive screws on the bracket with the threaded insert holes near the ejector levers on each end of the line card faceplate and finger-tighten the screws.
- Step 3** Use a flat-blade screwdriver to secure the two captive screws.

**Caution**

Do not overtighten the captive screws; overtightening the screws can strip the threads on the screw or the insert in the faceplate.

- Step 4** Repeat steps 1 through 3 for any remaining line cards.
- Step 5** Attach an appropriate number of velcro straps through the slots in the cable-management bracket to support the network interface cables ([Figure 5-21](#)).
- Pull the small end of the velcro strap through the slot in the cable-management bracket.
 - Insert the small end of the velcro strap into the slot in the wide end of the velcro strap.
 - Pull the small end through the velcro strap slot to secure it to the cable-management bracket.

Figure 5-21 Line Card Cable-Management Brackets with Velcro Straps

Step 6 Proceeding from the left port on the line card to the right port (on line cards with multiple ports), identify the network interface cable for the line card port and insert the cable connector into the line card port (see [Figure 5-21](#)).

- a. Align the interface cable with the cable-management bracket.
- b. Repeat for the remainder of the interface cables for this line card.

**Note**

Carefully adjust the interface cables in the cable-management bracket to prevent any kinks or sharp bends in the interface cables. Kinks and sharp bends can destroy or degrade the ability of the optical fiber to propagate the signal-encoded beam of light accurately from one end of the cable to the other. Also, allow adequate strain relief in the interface cables.

Step 7 Secure the interface cables to the cable-management bracket by wrapping the velcro straps around them (see [Figure 5-21](#)).

**Note**

Do not wrap the velcro straps too tightly.

Removing and Replacing a Consolidated Switch Fabric Card

Use the following procedure to remove and replace a CSF card.

**Caution**

The CSF card is not hot-swappable component. You must shut down the router before removing the CSF.

- Step 1** Power off the router (see [“Powering Off the Router” section on page 5-3](#)).
- Step 2** Loosen the two captive screws on each side of the CSF card.
- Step 3** Grasp the card ejector levers and pivot them away from the CSF card faceplate ([Figure 5-22](#)).

Figure 5-22 *Installing a CSF Card*

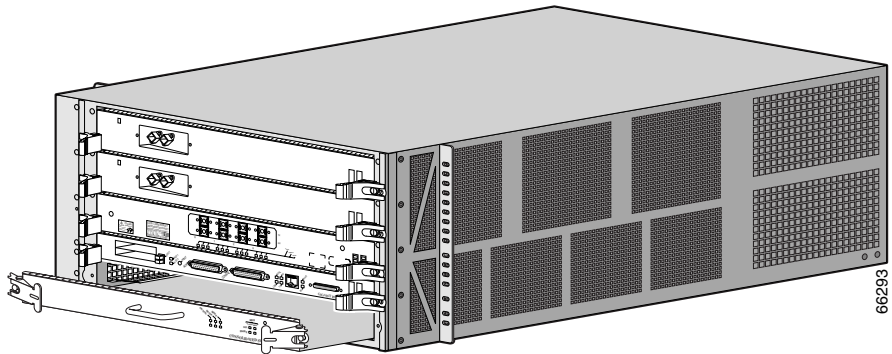
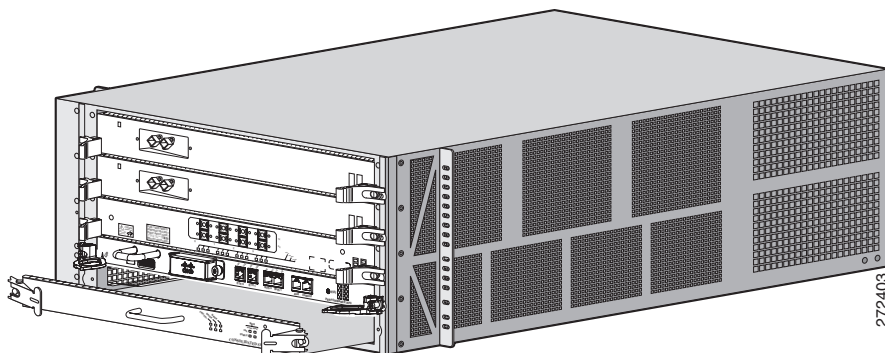


Figure 5-23 Installing a CSF Card (with PRP-3 installed)



- Step 4** Slide the CSF half-way out of the slot, then *stop*.
- Step 5** Touching only the metal card carrier, use your free hand to support the bottom of the CSF and slide the card completely out of the chassis.
- Always place the CSF directly into an antistatic bag or other ESD-preventive container.
 - If you plan to return the defective CSF to the factory, repackage it in the shipping container you received with the replacement card.
- Step 6** Set both edges of the CSF carrier into the card slot carrier alignment grooves on either side of the CSF slot and slide the card halfway into the chassis.
- Step 7** Pivot the ejector levers outward away from the faceplate.
- Step 8** Slide the card into the CSF slot until the ejector levers make contact with the front of the card cage, then *stop*.
- Step 9** Pivot the ejector levers toward the faceplate until the connector properly seats in the backplane.
- Step 10** Tighten the two captive screws.



Caution

Do not overtighten the captive screws; over tightening can strip the threads on the screw or in the insert in the CSF faceplate.

- Step 11** Power on the router.

If the router does not power on correctly, see the [“Troubleshooting the Line Cards” section on page 4-24](#).

Upgrading the RP and Line Card Memory

Upgrading the RP and line card memory is presented in the *Cisco XR 12000 Series Router Memory Replacement Instructions*. This document contains the latest information about memory requirements and replacing memory on the Cisco XR 12404 Router RP and line cards. Consult this publication before replacing memory on your RP or line card, or adding memory to your RP or line card.

You can find Cisco XR 12000 Series Router memory replacement instructions at Cisco.com.