



# Removing and Replacing Chassis Components

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This chapter provides instructions on how to remove and replace components in the Cisco NCS 6000 Fabric Card Chassis (FCC).

- [Removing the Exterior Cosmetics](#) , page 1
- [Removing the Power Components](#), page 10
- [Replacing the Fan Trays and Air Filter](#), page 24
- [Removing the Shelf Controller Cards and Fabric Cards](#), page 29

## Removing the Exterior Cosmetics

This section describes how to remove the front side and rear side exterior cosmetics on the FCC. We recommend that you remove the cosmetics in the order outlined in this section.



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**Note**

While it is possible to remove most of the cosmetic parts on the FCC separately, some parts (such as the vertical cable trough) require that other parts be removed first.

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## Prerequisites

Ensure that you have all the original packaging material that shipped with the FCC, or any other packaging suitable for packing the cosmetics.

## Required Tools and Equipment

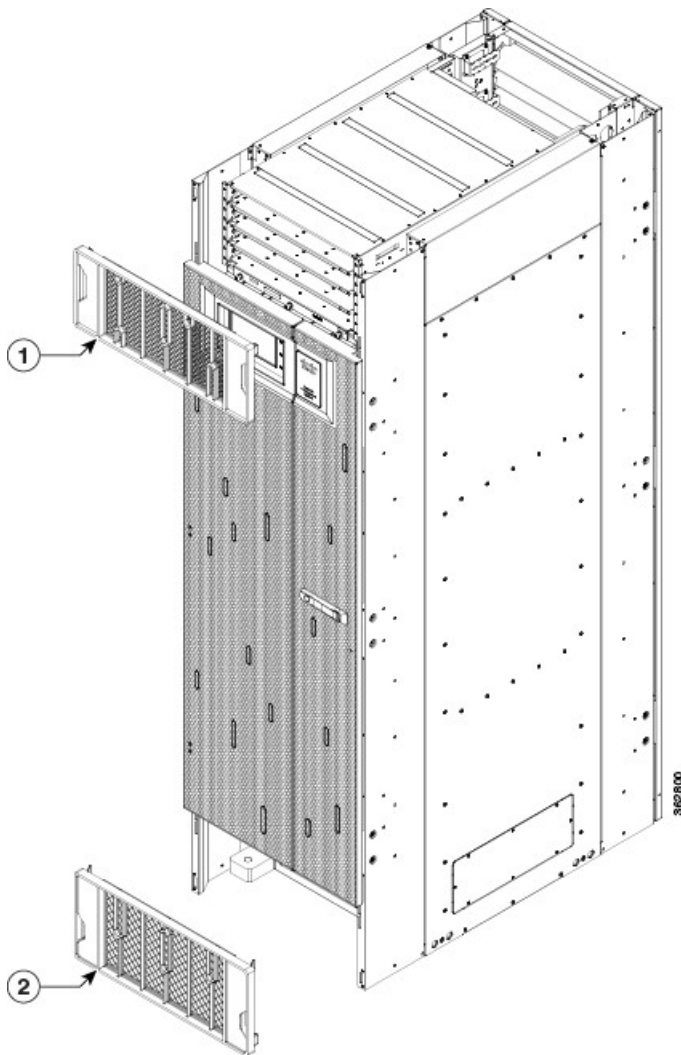
- 8-inch, Number-1 Phillips screwdriver (magnetic head preferable)

## Removing the Front Exterior Cosmetics

To remove the front exterior cosmetics, follow these steps:

**Step 1** Remove the top and bottom front grilles by unsnapping them from the snap joiners located behind each grille.

**Figure 1: Removing the Front Grilles**

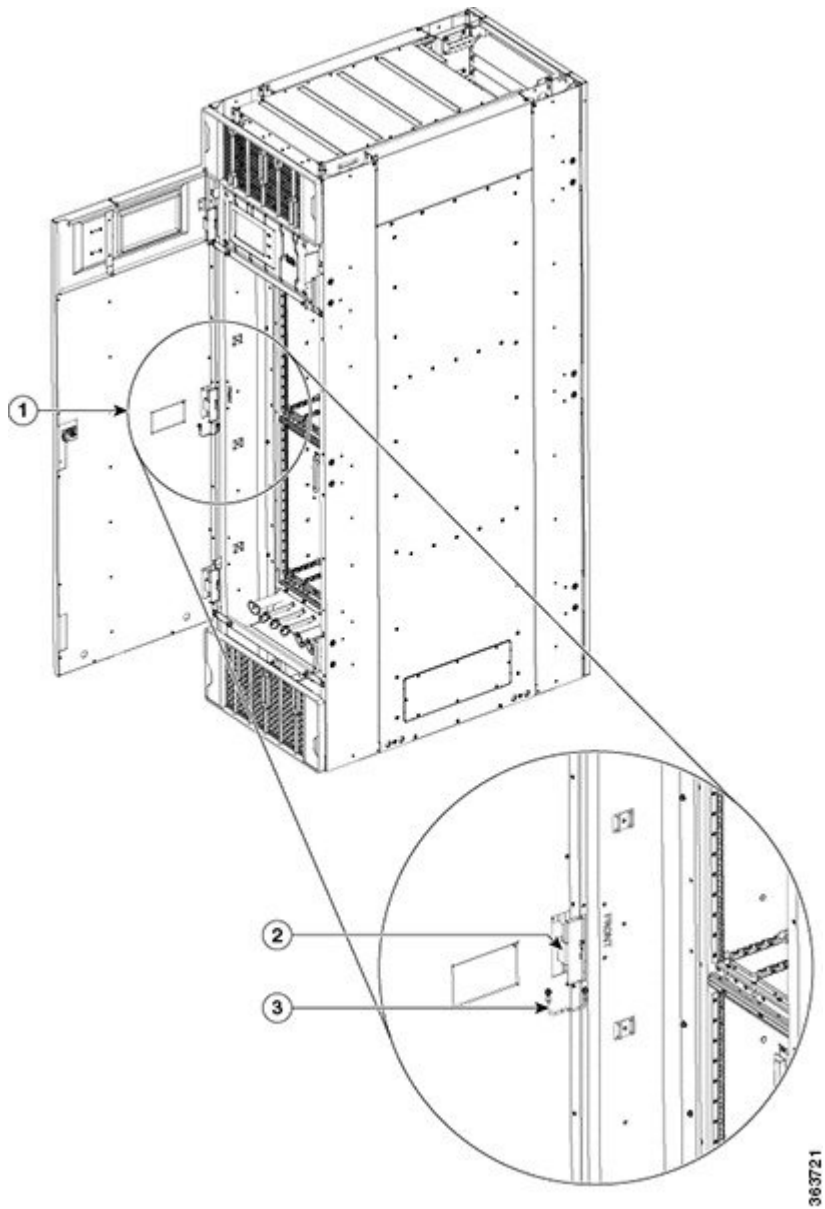


1	Front top grille	2	Front bottom grille
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**Step 2** Remove the front door.

- a) Remove the grounding cable by loosening and removing the two pan-head screws.
- b) Lift the door up and off the hinge attachment pins and pull it away from the FCC.

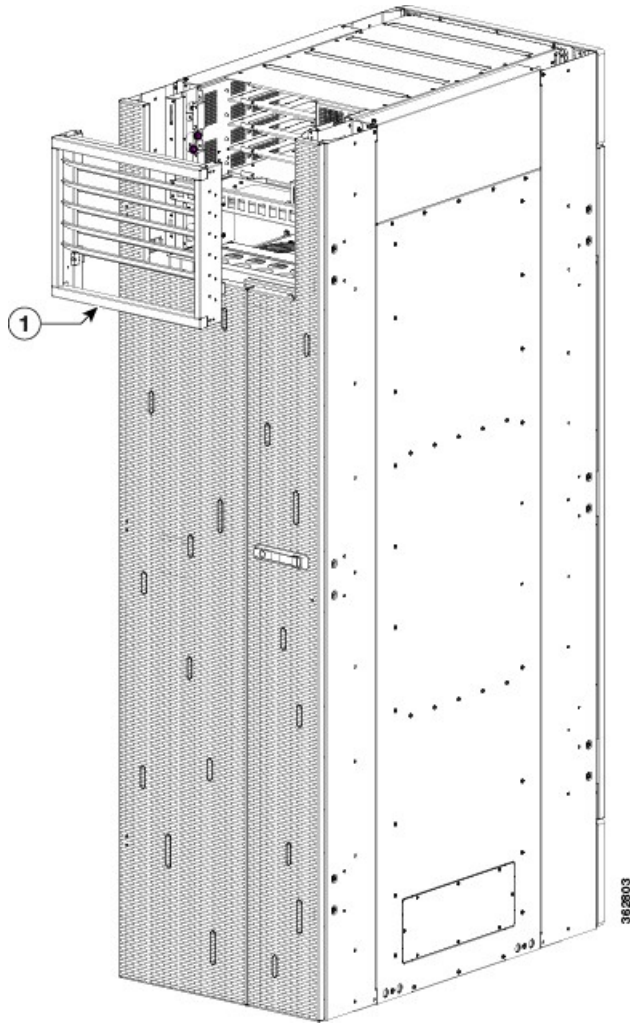
**Figure 2: Removing the Door Grounding Cable—Front Door Shown**



1	Front door	3	Grounding cable
2	Door hinges		

- Step 3** Remove the side filler panels.
- a) Open the door.
  - b) Remove the exhaust air deflector.

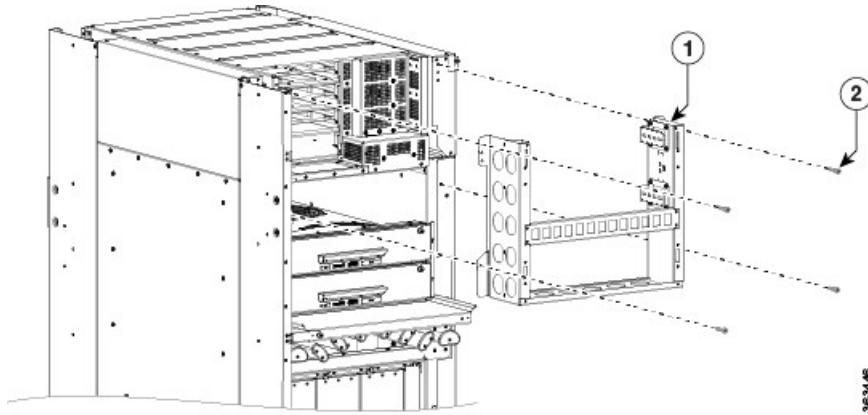
**Figure 3: Removing the Exhaust Air Deflector—Rear of the FCC**



1	Exhaust air deflector
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- c) Remove the exhaust plenum bracket by loosening and removing the six pan-head screws (three per side) on each side of the plenum bracket. For DC installations, make sure that you disconnect the DC cables from the bracket first.

**Figure 4: Removing the Exhaust Plenum Bracket—Rear of the FCC**

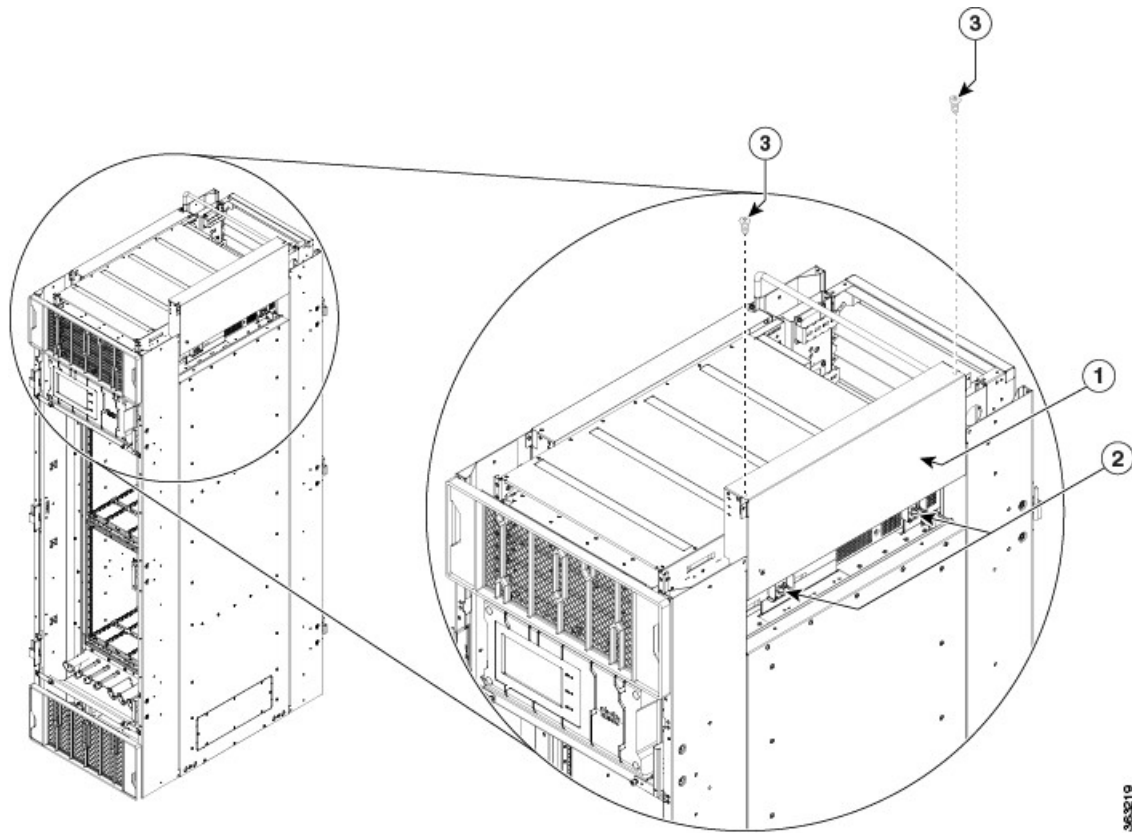


1	Exhaust plenum bracket	2	Six pan-head screws (three per side)
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- d) Loosen and remove the two 8-32 screws on each filler panel.

- e) Remove the filler panels from the FCC.

**Figure 5: Removing the Filler Panels**



1	Filler panel (one each side)	3	Two 8-32 screws
2	Guide pins		

**Step 4** Remove the two upper and lower horizontal cable management brackets by loosening and removing the eight pan-head screws (four per bracket).

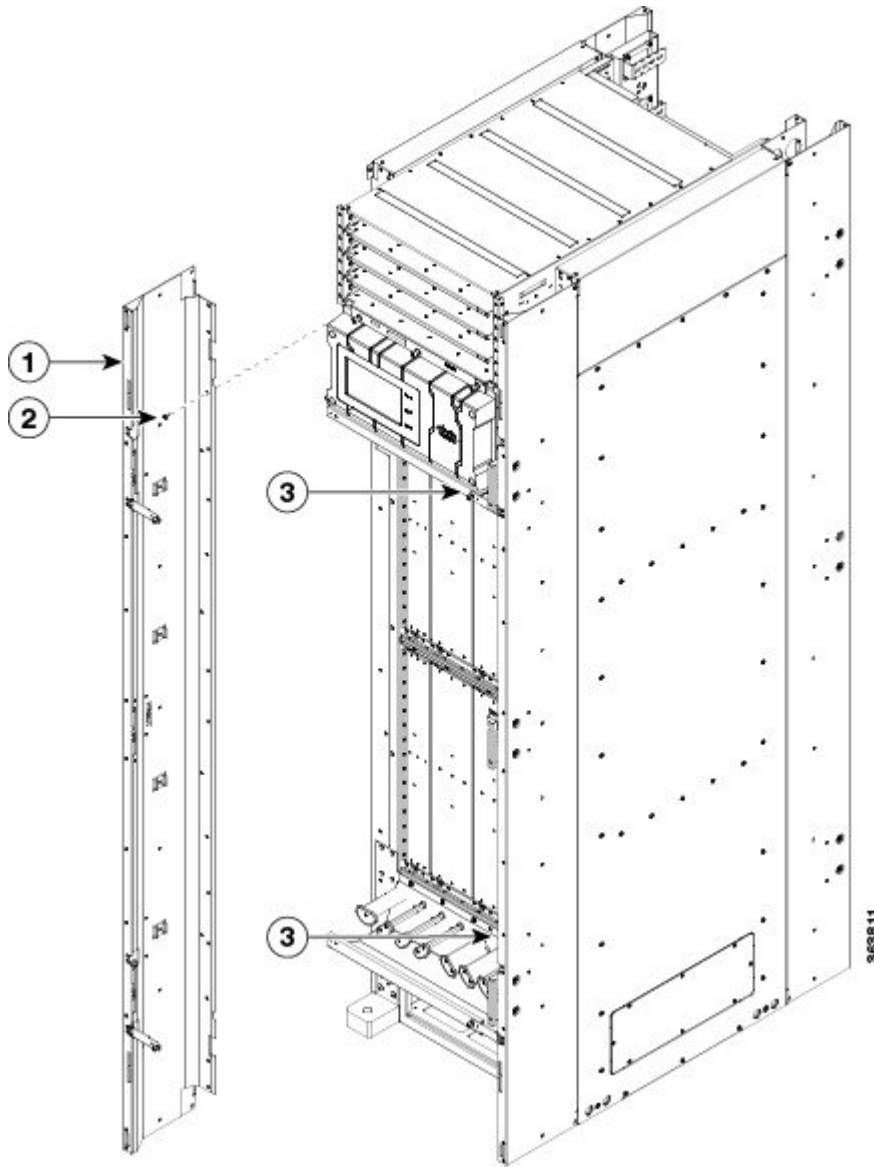
**Step 5** Remove the left and right vertical cable troughs from the front of the FCC.  
**Note** We recommend that you use two people to remove the vertical cable troughs, one person to hold the vertical cable troughs while the other person removes the pan-head screws.  
 For each vertical trough:

- a) Loosen the captive screw on the two trough retention brackets and swing the brackets away.

b) Loosen and remove the eight pan-head screws from the trough.

**Step 6** Pull the trough away and carefully remove it from the FCC.

**Figure 6: Removing the Front Vertical Cable Troughs**



1	Vertical cable troughs (one per side)	3	Two cable management baskets
2	Pan-head screws (eight per trough)		

- Step 7** If needed, remove the craft panel located on the front of the FCC (see the above figure). In most cases, it is not necessary to remove the craft panel although the assembly is a field-replaceable unit (PID NCS-CRFT=).
- Loosen the four captive screws on the craft display panel.
  - Pull the craft display panel away from the FCC to remove it.
  - Loosen the four captive screws on the sheet metal craft panel.
  - Pull the craft panel away from the FCC to remove it.
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## Removing the Rear Exterior Cosmetics

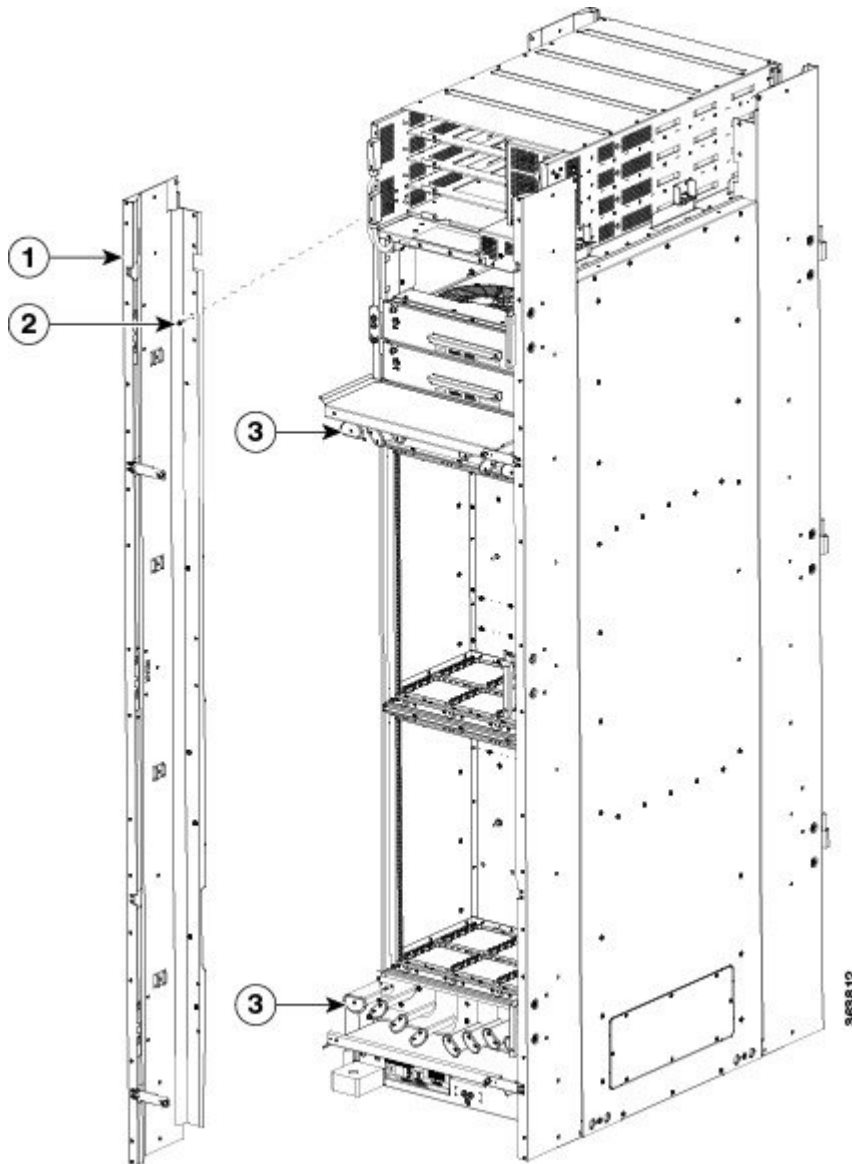
To remove the rear exterior cosmetics, follow these steps:

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- Step 1** Remove the rear door.
- Open the door and remove the grounding cable by loosening and removing the pan-head screws ([Figure 2: Removing the Door Grounding Cable—Front Door Shown](#)).



- b) Lift the door up and off the hinge attachment pins and pull it away from the FCC.

**Figure 7: Removing the Rear Vertical Cable Troughs**



1	Vertical cable troughs (one per side)	3	Two cable management brackets
2	Pan-head screws (eight per trough)		

- Step 2** If applicable, remove the exhaust plenum bracket by removing the eight pan-head screws, four on each side ([Figure 4: Removing the Exhaust Plenum Bracket—Rear of the FCC](#)).
- Step 3** Remove the two upper and lower horizontal cable management brackets by loosening and removing the eight pan-head screws (four per bracket).
- Step 4** Remove the left and right vertical cable troughs from the rear of the FCC.  
**Note** We recommend that you use two people to remove the vertical cable troughs, one person to hold the vertical cable troughs while the other person removes the pan-head screws.  
 For each vertical trough:
- Loosen the captive screw on the trough retention brackets (two each side) and swing the brackets away from the FCC.
  - Loosen and remove the eight pan-head screws from the trough.
- Step 5** Pull the trough away and carefully remove it from the FCC.
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## Removing the Power Components

This section describes how to remove and replace the power components and power enclosure from the Cisco NCS 6000 Fabric Card Chassis (FCC).



### Note

While it is possible to remove power components from the FCC separately, some parts (such as the power trays) require that other parts be removed first.

We recommend that you remove the power components in the order outlined in this section.

## Removing AC Input Power Cords

This section describes how to remove AC input power cords from a power tray.

### Prerequisites

Remove the exhaust air deflector from the rear of the Cisco NCS 6000 FCC. Power off the AC PMs in the tray that you want to disconnect.



### Note

Before removal, make sure that the input power cables are not energized.

### Required Tools and Equipment

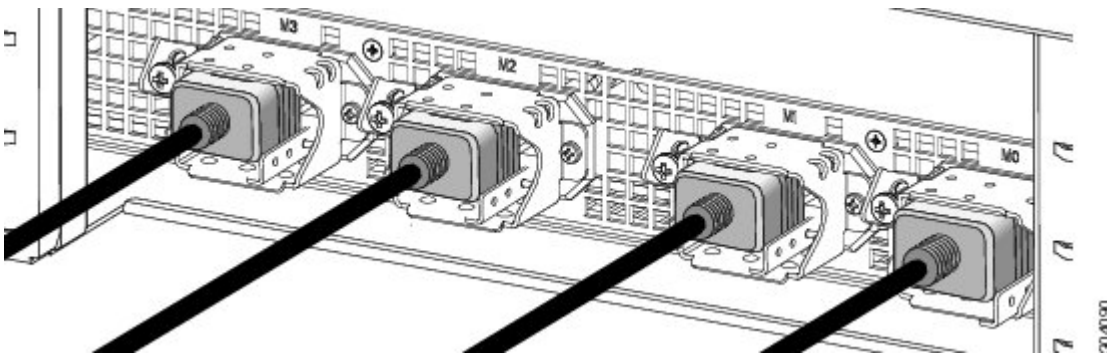
- ESD-preventive wrist strap
- 6-inch, Number-1 Phillips screwdriver

## Steps

To remove the AC input power cords, go to the rear of the FCC and follow these steps:

- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to one of the two ESD jacks (see [Preventing Electrostatic Discharge](#)) on the rear of the FCC. You can also connect the ESD-preventive wrist strap leash to any bare metal surface on the FCC.
- Step 2** Verify that the AC input source breaker is in the OFF position.
- Step 3** Use the screwdriver to loosen the screws that clamp the cords in place.
- Step 4** Remove the cords from the cord clamps.

**Figure 8: AC Input Power Cords Connected to the Power Tray**



## Removing DC Input Power Cables

This section describes how to remove the DC input power cables from a power tray terminal block.

### Prerequisites

Power off the PCM output switch for the DC PMs in the tray that you want to disconnect ([Figure 19](#)). Ensure that you have redundant power to avoid the router from being shut down in error.



#### Note

Before removal, make sure that the input power cables are not energized.

You need the following tools to perform this task:

- ESD-preventive wrist strap
- 6-inch, Number-1 Phillips screwdriver
- 3/8-inch ratchet wrench with 7/16-pt. socket

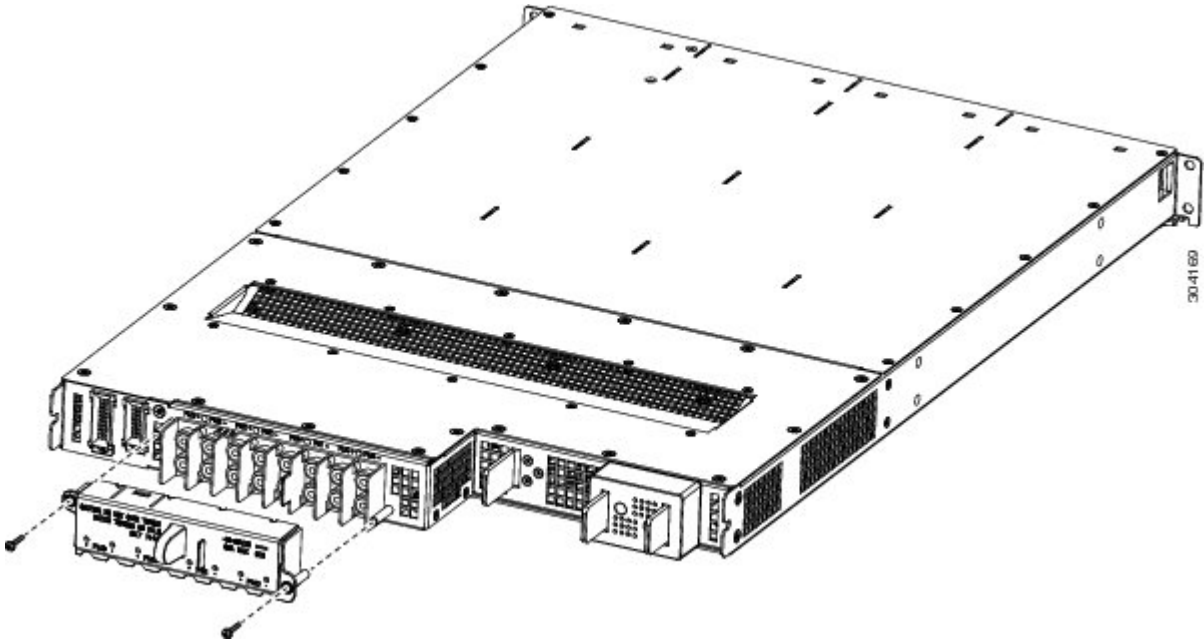
- Voltmeter

## Steps

To disconnect the DC input power cables, follow these steps:

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- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to one of the two ESD jacks (see [Preventing Electrostatic Discharge](#)) on the rear of the FCC. You can also connect the ESD-preventive wrist strap leash to any bare metal surface on the FCC.
- Step 2** Open the input circuit breakers/fuses for the DC cables to be removed and using the voltmeter, verify that there is no voltage on the cables that are about to be removed.
- Step 3** Use the screwdriver to remove the bolts that secure the terminal block cover into the mounting standoff.

**Figure 9: DC Terminal Block Cover Installed on Rear of the Power Tray**



- Step 4** Slide the terminal block cover downwards.
- Step 5** Remove the terminal block cover.
- Step 6** Using the ratchet wrench, remove the positive and negative cable pairs from each terminal block.  
**Note** When a cable is removed from the rear of the DC power tray, we recommend that you wrap the cable lug with standard black electrical tape.
- Step 7** Replace the terminal block cover.
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## Replacing an AC or DC Power Tray

This section describes how to replace an AC or DC power tray in the FCC power enclosure. Although there are differences between AC and DC power trays, they are reinstalled by using the same procedures described below. Once they are installed into an FCC that is properly grounded, external grounding to the power tray is not needed.

**Note**

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As a requirement to receive Cisco support, all four power trays must be installed in the FCC.

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**Caution**

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Because of the weight of the power tray, 20 lb (9 kg), and the height at which the power tray is installed in the FCC, you should be especially careful while removing and carrying the power tray. To prevent injury, avoid sudden twists or lateral moves.

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### Prerequisites

Before you reinstall an AC or DC power tray, do the following:

- Remove the exhaust air deflector from the rear of the Cisco NCS 6000 FCC.
- Power off the power shelf that houses the power tray you are about to install by using the I/O power switch on the respective PCM.
- Power off the AC PMs in the tray that you want to disconnect.
- Remove the AC or DC input cables from the rear of the power enclosure.
- Remove the top grilles from both the front and rear sides of the FCC, if installed.
- Ensure the power tray you are about to remove is empty. Do not install a power tray into the FCC with PMs already installed in the power tray.

**Caution**

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The I/O switch on each power shelf only disables the output of the PMs in that shelf. Make sure that the other power trays provide redundant power. The inputs to the PMs remain hot, as well as the system's internal busbar (due to the other power shelf).

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### Required Tools and Equipment

- 6-inch, Number-2 Phillips screwdriver
- Torque screwdriver with Number-2 Phillips-head and torque rated up to 55 in-lb (6.2 N-m)
- AC or DC power tray
  - AC power tray (Cisco PID NCS-AC-PWRTRAY=)
  - DC power tray (Cisco PID NCS-DC-PWRTRAY=)

## Steps

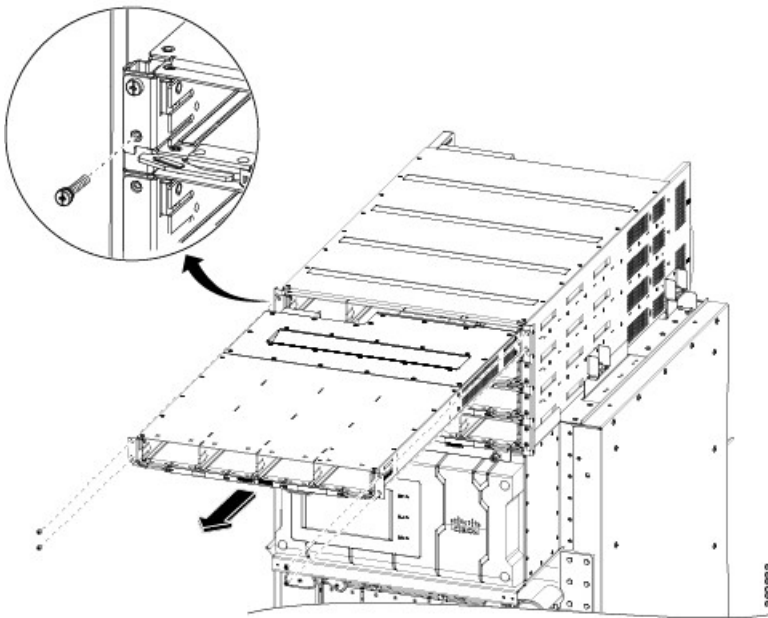
To replace an AC or DC power tray, follow these steps:

### Step 1

Remove the power tray that you are replacing.

- Remove the power modules from the power tray (Figure 12: Removing a PM from a Power Tray).
- Loosen and remove the four M4 x 10 mm screws that attach the power tray to the power enclosure (Figure 10: Removing a Power Tray from the Power Enclosure).

**Figure 10: Removing a Power Tray from the Power Enclosure**



- Pull both the left and right ejector handles out at the same time to eject the power tray from the FCC. Slide the power tray all the way out of the power enclosure.

**Caution** Do not use the ejector handles for lifting or supporting the power tray, because this could severely damage the handles.

### Step 2

Install the replacement power tray.

- Using two people, one to support the power tray underneath and the other to keep it steady, lift the power tray up and slide it partially into a power tray slot on the front side of the FCC.
- Grasping both handles simultaneously, push both the left and right handles in at the same time to push the tray into the FCC. Slide the tray all the way into the FCC, until both power tray handles hook around the pins.

**Caution** Use care not to bend the handles.

- Use the screwdriver to tighten the four M4 x 10 mm screws that attach the power tray to the FCC.
- Use the torque screwdriver to tighten the four screws to a torque value of 15 in-lb (1.69 N-m) to 20 in-lb (2.26 N-m).

**Note** The screws that attach a power tray to the power enclosure are relied upon for power tray bonding and grounding.

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## Removing a Power Module Slot Cover

This section describes how to remove a PM slot cover from a PM slot in an AC or DC power tray.

### Prerequisites

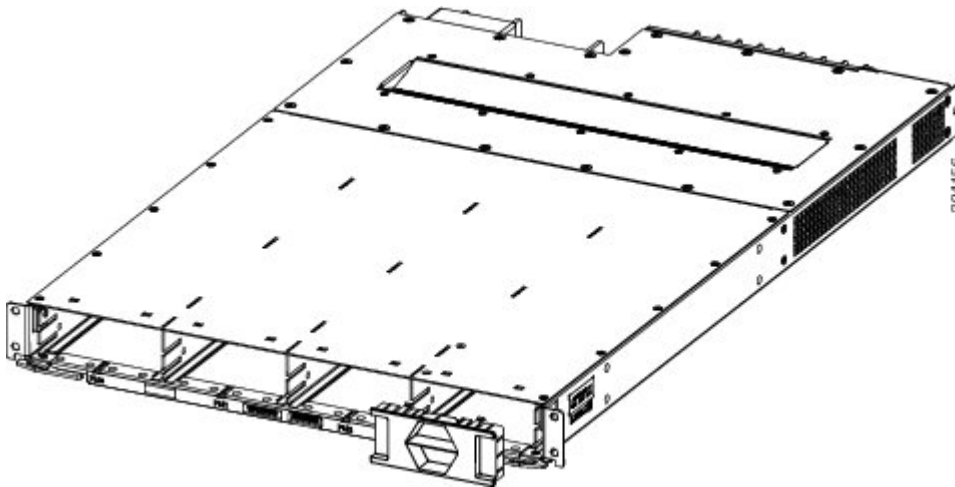
Before performing this task, you must first remove the top grille on the front side of the FCC, if installed. See the [Removing the Front Exterior Cosmetics](#), on page 2.

### Steps

To remove a PM slot cover from the front of a power tray, follow these steps:

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- Step 1** Gently pinch the tabs on the top of the PM slot cover to partially detach the slot cover from the slot.
- Step 2** Slide the PM slot cover out by removing the tabs on the bottom of the PM slot cover from the two holes on the bottom of the slot.

**Figure 11: PM Slot Cover on the Front of a Power Tray—DC Power Tray Shown**



## Removing an AC or DC Power Module

This section describes how to remove a power module from a power tray.

### Prerequisites

Before performing this task, you must first remove the top grille on the front side of the FCC, if installed. See the [Installing the Front Exterior Cosmetics](#).

**Note**

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It is not necessary to turn off the switch on the power tray to remove individual power modules. Power modules support OIR, so they can be removed and replaced with the power on and the system operating.

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### Required Tools and Equipment

- ESD-preventive wrist strap
- 6-inch, Number-1 Phillips screwdriver

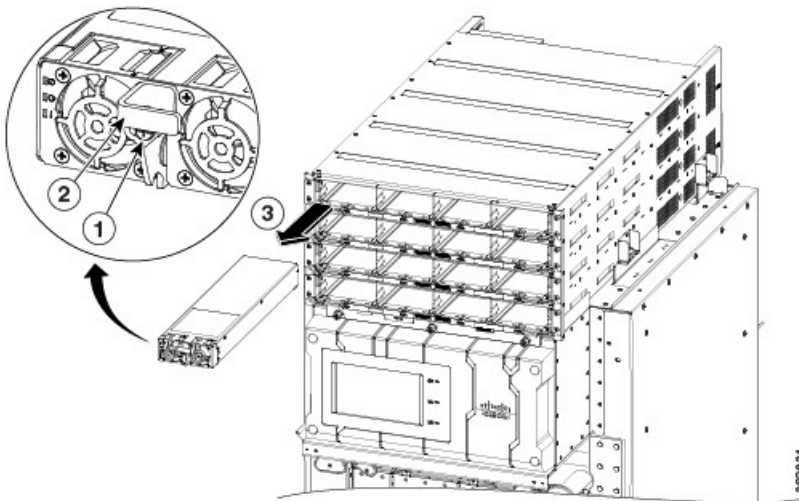


## Steps

To remove a power module from the front of a power tray, follow these steps:

- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to the ESD jack on the front side of the FCC (see [Preventing Electrostatic Discharge](#)). You can also connect the ESD-preventive wrist strap leash to any bare metal surface on the FCC.
- Step 2** Using the screwdriver, unscrew the ejector lever screw.

**Figure 12: Removing a PM from a Power Tray**



1	Ejector lever screw	3	Power module (PM)
2	Ejector lever		

- Step 3** Rotate the ejector lever down to unseat the PM.
- Step 4** Slide the PM out of its bay in the power tray while supporting it with your other hand.

## Removing the FCC Ground Cable

This section describes how to remove the FCC ground cable on the Cisco NCS 6000 FCC.

## Prerequisites

Before performing this task, completely power off the entire system. Remove all AC or DC input power connections.

**Caution**

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Do not remove the FCC ground cable unless the FCC is powered off and to be replaced.

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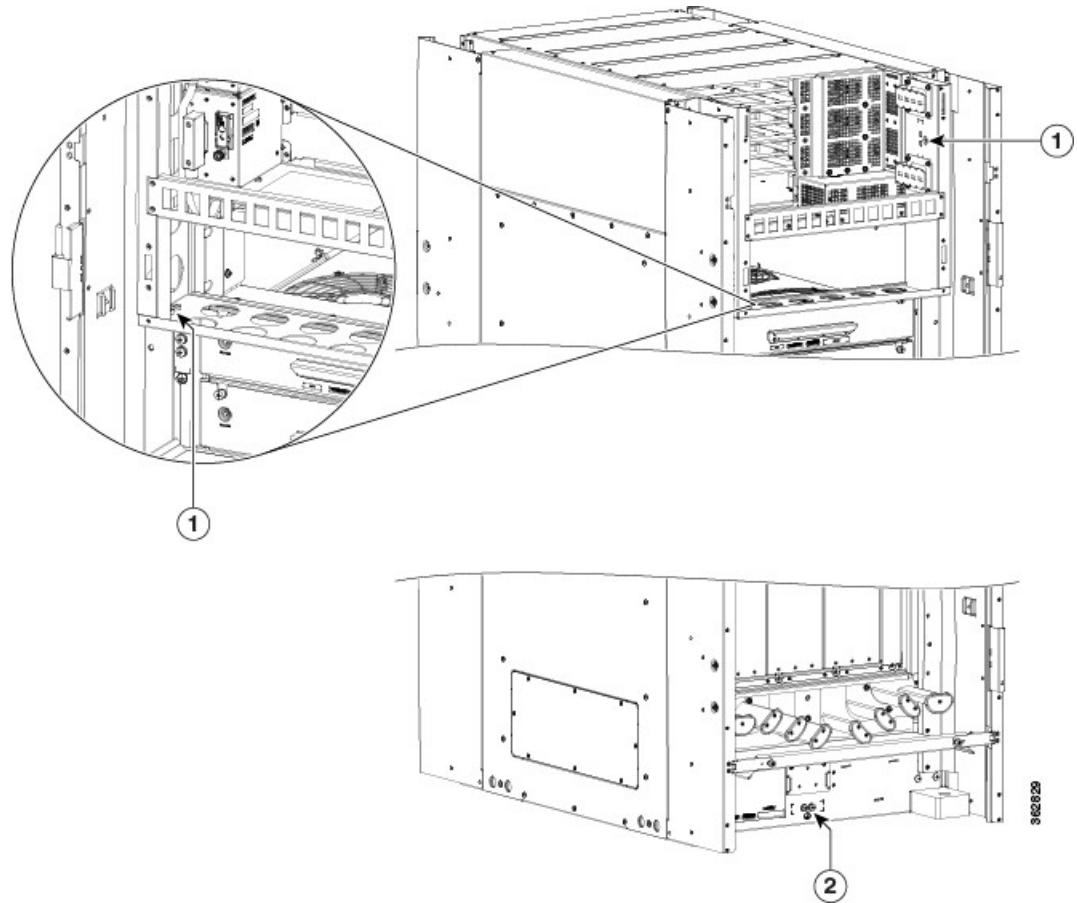
## Required Tools and Equipment

- 3/8-inch drive socket wrench
- 10-mm 6-pt. socket

### Steps

To remove the ground cable from the FCC, remove the two M6 bolts that attach the ground cable to the NEBS grounding point.

**Figure 13: NEBS Bonding and Grounding Points—Rear Side of the FCC**



1	NEBS bonding and grounding points (upper)	2	NEBS bonding and grounding point (lower)
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## Replacing a Power Control Module

This section describes how to remove and reinstall a PCM from the Cisco NCS 6000 FCC. The FCC ships with two power control modules (PCMs) attached to the power enclosure. The PCMs are located behind the two set of power trays (FT0 and FT1) on the rear of the FCC (Figure 14: Removing a PCM).

**Note**

The PCM is a field-replaceable unit. If needed, you can order a replacement module from Cisco at the following URL (Cisco login required): <https://cisco-apps.cisco.com/cisco/psn/commerce>

## Required Tools and Equipment

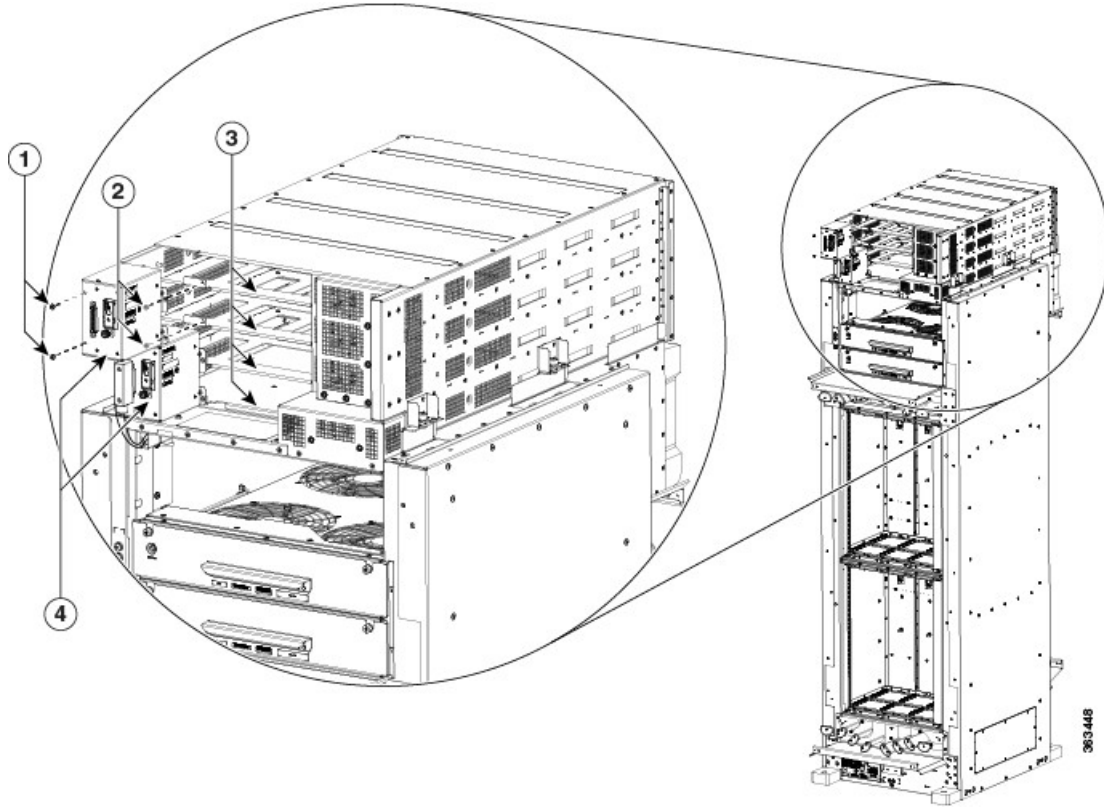
- ESD-preventive wrist strap
- Number-1 Phillips magnetic screwdriver
- Replacement PCM (Cisco PID NC6-PCM=)

## Steps

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- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to the ESD jack on the front side of the FCC (see [Preventing Electrostatic Discharge](#)). You can also connect the wrist strap to any bare metal surface on the FCC.
- Step 2** Power off each set of power trays by using turning the I/O power switch to OFF on the respective PCM.
- Step 3** Completely power off the entire system at the supply circuit breakers.
- Step 4** Remove the four M4 Phillips pan-head screws from each power tray. Using the ejector handles, slide the power tray forward just enough to disengage the connector to the PCM without removing the power cables (approximately 1-inch).  
**Note** The power trays must be pushed out so that the PCM freely disengages from the connector.
- Step 5** Using the magnetic screwdriver, remove the screws from the PCM ([Figure 14: Removing a PCM](#)).
- a) Loosen and remove the two 6-32 pan-head screws on the left front face of the PCM.

b) Loosen and remove the three 6-32 flat-head screws on the right side flanges of the PCM.

**Figure 14: Removing a PCM**



1	Two 6-32 pan-head screws	3	Four power trays (2 trays for each PCM)
2	Two 6-32 flat-head screws	4	Two PCMs

**Step 6** Using the magnetic screwdriver, attach the replacement PCM.

- a) Re-insert and tighten the two 6-32 pan-head screws on the left front face of the PCM.
- b) Re-insert and tighten the three 6-32 flat-head screws on the right side flanges of the PCM.

**Step 7** Push each power tray in until it engages with the power enclosure connectors.

**Step 8** Re-insert and tighten the four pan-head screws for each power tray.

## Removing the Power Enclosure

This section describes how to remove a power enclosure from the Cisco NCS 6000 FCC. In most cases, it is not necessary to remove the power enclosure although it is field-replaceable (Cisco PID NCS-F-PWR-SHELF=).



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**Note** When removing the power enclosure, you must first remove the power modules and the power trays. See the [Replacing an AC or DC Power Tray, on page 13](#) section and the [Removing an AC or DC Power Module, on page 16](#) section.

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## Required Tools and Equipment

- 6-inch, Number-2 Phillips screwdriver



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**Note** The power enclosure weighs approximately 30 lb (13.7 kg) and sits on top of the FCC. To prevent injury, we recommend that you use a ladder and two people when removing the power enclosure.

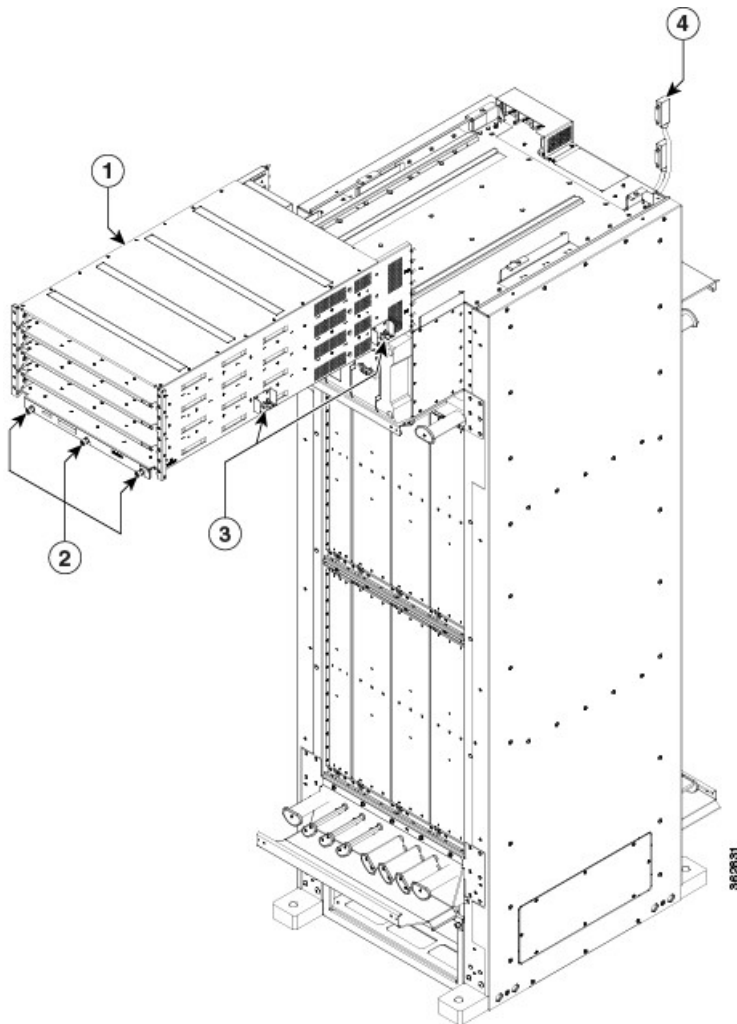
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## Steps

Follow these steps to remove the power enclosure from the FCC.

- Step 1** Disconnect the two D-Sub connector cables from the PCMs on the rear of the power enclosure.
- Step 2** Untighten the two captive screws on each side of the power enclosure and the three captive screws on the front flanges.
- Step 3** Standing in front of the FCC, slide the power enclosure towards you, grasping it with one hand on the side of the power shelf and the other hand underneath it for support.
- Step 4** Carefully lift the power enclosure and remove it completely from the FCC.

**Figure 15: Removing the Power Enclosure**



1	Power enclosure	3	Side captive screws (two per side)
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2	Three front captive screws	4	D-Sub connector cables (one per PCM)
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## Replacing the Fan Trays and Air Filter

This section describes how to replace a fan tray and air filter from the Cisco NCS 6000 FCC and includes the following topics:



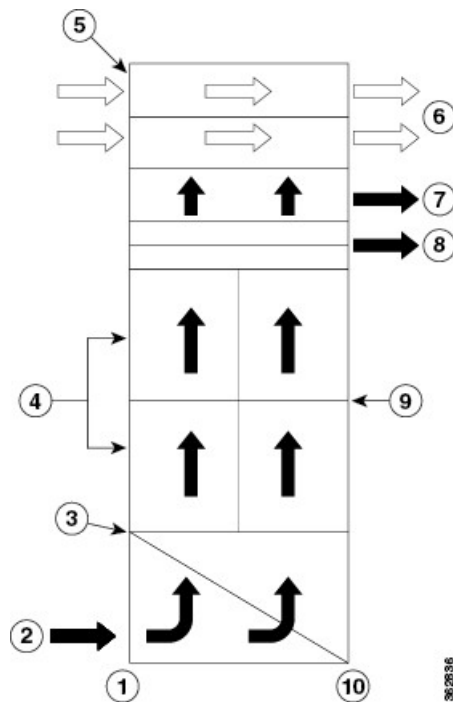
**Note**

The NCS 6000 FC is shipped with the air filter preinstalled.

### About the Fan Trays and Air Filter

This section provides an overview of the fan trays and air filter for the Cisco NCS 6000 FCC. These components help circulate and filter the airflow throughout the FCC.

**Figure 16: FCC Airflow**



1	Front side of the FCC	6	Exhaust air from PMs
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2	Air inlet plenum	7	Air exhaust plenum
3	Air filter	8	Fan trays (rear)
4	Front upper and lower card cages	9	Rear upper and lower card cages
5	Air flow through PMs	10	Rear side of the FCC

The airflow volumes for a fully loaded Cisco NCS 6000 FCC are as follows:

- Chassis airflow: Up to 1980 cubic feet (56,6000 liters) per minute
- DC power system airflow: Up to 120 cubic feet (3400 liters) per minute
- AC power system airflow: Up to 88 cubic feet (2500 liters) per minute

## About the Fan Trays

The Cisco NCS 6000 FCC has two fan trays located directly above the upper cable management bracket on the rear of the FCC (Figure 2).

When there is one or more fan failures, the system monitors the temperature sensors mounted on the critical components within the various boards and increases fan throughput to hold temperatures below their critical threshold. The system does this monitoring even when all the fans are operating correctly (so that it protects the components if the air intake is blocked for example). If temperatures exceed the critical threshold, the associated cards are shut down to avoid permanent damage.

If either fan tray is removed from the FCC, the other fan tray will immediately spin up to maximum speed to provide sufficient cooling performance. Although the system can operate indefinitely at full capacity with just one operational fan tray up to an ambient room temperature of 40°C (104°F) without overheating, there is no longer any redundancy offered, so immediate replacement of the missing fan tray is advised.

When both fan trays are removed, a critical alarm is generated, along with a syslog message warning you to install a fan tray or the entire FCC will shut down in 45 seconds.



**Note**

The upper and lower fan trays are interchangeable so the fan tray installation is the same.

## Fan Tray LEDs

The green/yellow LED lights when the fan tray is inserted into the fan tray slot. The following table describes the fan tray LEDs and their meanings.

**Table 1: NCS 6000 FCC Fan Tray LEDs**

LED Color	Description
Green	The fan tray is operating normally.
Yellow	The fan tray has one or more errors detected.

LED Color	Description
Off	No power is applied to the fan tray.

## About the Air Filter

The Cisco NCS 6000 FCC has a serviceable air filter mounted in a slide-out tray accessible from the front of the FCC just below the lower cable management bracket (Figure 1). The air filter removes dust from the room air drawn into the FCC by the two fan trays. Once a month (or more often in dusty environments), you should examine the air filter. Replace it if it appears excessively dirty or damaged.

Failure to replace a compromised air filter can result in insufficient air circulation through the FCC and temperature-related environmental alarms. For information about replacing the air filter, see the [Replacing the Air Filter](#), on page 28 section.



### Note

To comply with Telecordia GR-63-Core standard air filter requirements for NEBS deployments, the air filter must be replaced, not cleaned.

## Replacing the Fan Tray

### Prerequisites

Before performing this task, open the rear cosmetic doors, if installed.

### Required Tools and Equipment

- ESD-preventive wrist strap
- 6-inch, Number-1 Phillips screwdriver
- Fan tray (Cisco PID NC6-FANTRAY=)

### Steps

To replace a fan tray, follow these steps:

- 
- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to the ESD jack on the front side of the FCC (see [Preventing Electrostatic Discharge](#)). You can also connect the ESD-preventive wrist strap leash to any bare metal surface on the FCC.
- Step 2** Using the screwdriver, loosen the two captive screws on the fan tray faceplate. If necessary, use a step platform to reach the upper fan tray comfortably.
- Step 3** Pull firmly on the fan tray handle to pull it free; two people are required to remove the fan tray.

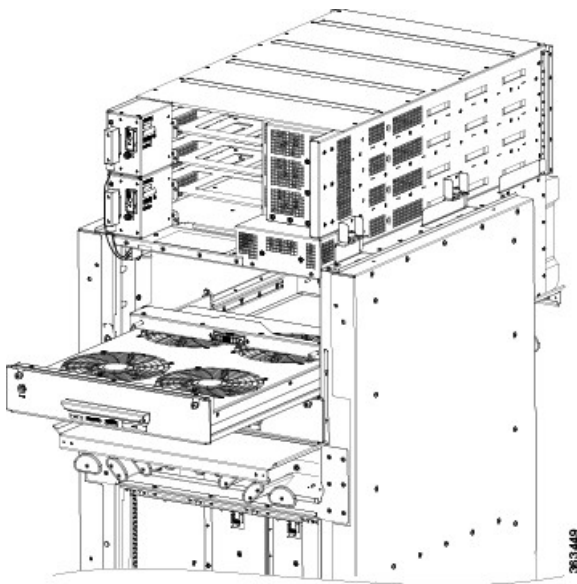
**Caution** Because of the weight of the fan tray, approximately 30 lb (14 kg), two people are required to remove the fan tray. Be especially careful while removing the fan tray from the FCC. To prevent injury, keep your back straight and lift with your legs, not your back. Avoid sudden twists or lateral moves. It is safer to use two people to remove the fan tray rather than a single person.

**Step 4** Grasp the fan tray handle and pull it straight out to disconnect the fan tray from the connector mounted on the front of the fan tray bay on the rear side of the FCC. Slide the fan tray halfway from the fan tray bay.

**Step 5** Use your free hands to support the fan tray, and then slide the fan tray completely from the fan tray bay.

**Step 6** To install the replacement fan tray, use both hands to support and position the fan tray in front of the fan tray bay (the labels are located on the bottom of the fan tray).

**Figure 17: Replacing a Fan Tray**



**Step 7** Slide the fan tray into the fan tray bay. Stop when the fan tray makes contact with the FCC connector in the back of the fan tray bay.

**Caution** To prevent damage to the FCC connector, do not use excessive force when inserting a fan tray into its bay.

**Step 8** Firmly push on the fan tray handle to seat the fan tray connector in the FCC connector. When the fan tray is completely seated, the fan tray faceplate flanges meet the rear side of the FCC.

**Note** All electrical and control line connections are made automatically when the connectors mate. The LED will light when the fan tray is inserted. The LED is yellow initially, until the system has confirmed it is functioning correctly.

**Step 9** Tighten the captive screws on each side of the fan tray faceplate.

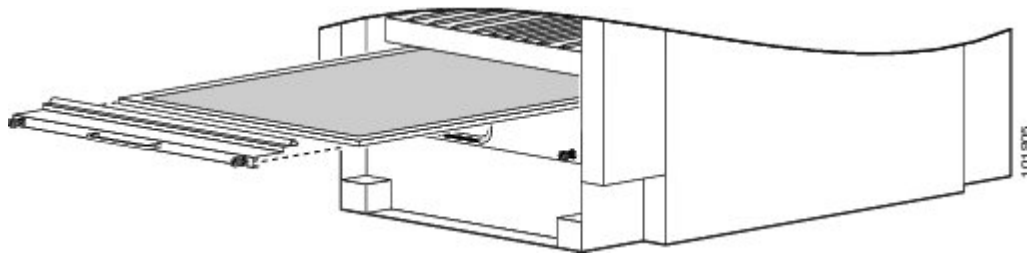
## Replacing the Air Filter

This section describes how to install an air filter in the Cisco NCS 6000 FC. The following figure shows the FCC air filter. The air filter is located on the front of the FCC as shown in [Figure 1](#).


**Note**

We recommend that you change the air filter every three months. The filter is sold in packs of five through Cisco (PID NC6-5XFILTER=).

*Figure 18: FCC Air Filter*


**Note**

A lattice of wire exists on both sides of the filter material with an arrow denoting airflow direction and a pair of sheet metal straps on the downstream side of the filter assembly.


**Caution**

Never operate the FCC without an air filter. Operating the FCC without a filter for an extended time can result in damage to the FCC hardware.

## Steps

To replace the air filter, follow these steps:

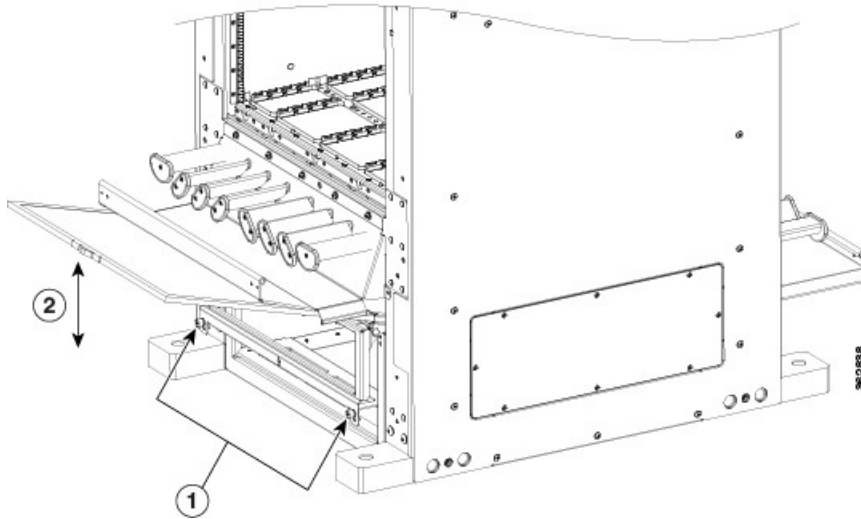
**Step 1**

Remove the filter you are replacing.

- a) Remove the lower grille, if installed.
- b) Loosen the two captive screws on the filter cover. The filter will automatically drop down.
- c) Pull outward on the center of the filter door to pull it free.

- d) Grasp the pull tab in the center of the air filter, and slide it out from the slot.

**Figure 19: Replacing the Air Filter—Front Side of the FCC**



1	Two captive screws	2	Air filter
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**Step 2**

Install the replacement air filter.

**Note** Verify air flow direction when installing the new air filter. An air flow direction arrow is stamped on the air filter frame and should be installed pointing up.

- a) Slide the new air filter into the slot.
- b) Swing up and push in the filter cover.
- c) Tighten the two captive screws on the front of the filter cover.

## Removing the Shelf Controller Cards and Fabric Cards

This section describes how to remove the shelf controller cards and fabric cards from the FCC.

### Guidelines for Removing a Card

- Online (in-service) insertion and removal (OIR) is supported, enabling you to remove the cards while the FCC is operating. OIR is seamless to users on the network, maintains all routing information, and ensures session preservation. It is not necessary to notify the software or reset the power. OIR removes power to a specific slot before the card is replaced. The power remains on for all other card slots.




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**Note** For a graceful shutdown, we recommend that you use the Cisco IOS XR **shutdown** command to shut down a fabric card prior to removing it from the FCC.

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- The different cards in the FCC are attached to the FCC itself using a pair of ejector levers and captive screws. The two ejector levers release the card from its backplane connector. The exact locations of the ejector levers and captive screws can vary slightly from card to card, but are generally in the same locations: on the upper and bottom ends of the faceplate.
- When you remove a card, you must press the OIR button before using the ejector levers to ensure that the connector pins disconnect from the backplane in the sequence expected by the FCC (only applies to FCs).
- Any unused card slots that are uncovered allows air used for FCC cooling to escape. To ensure proper air flow and maintain system EMC and safety compliance, any unused FC slots must contain impedance carriers, and all SC and SC-SW cards must remain installed in their card slots (see the [Installing and Removing an Impedance Carrier](#) and the [Figure 1](#) sections).

## Removing an SC or SC-SW Card

This section describes how to remove an SC or SC-SW card from the Cisco NCS 6000 FCC.

### Prerequisites

Before performing this task, open the cosmetic doors, if installed.




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**Note** The SC and SC-SW cards are hot-swappable. Perform these tasks when you are certain that the secondary SC or SC-SW card in the FCC is operational. The secondary card will automatically assume control. Failure to follow these guidelines can result in interruptions in data communications and network connectivity.

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**Warning** **Class 1 Laser Product.** Statement 113

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**Warning** **Because invisible radiation may be emitted from the aperture of the port when no fiber cable is connected, avoid exposure to radiation and do not stare into open apertures.** Statement 125

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### Required Tools and Equipment

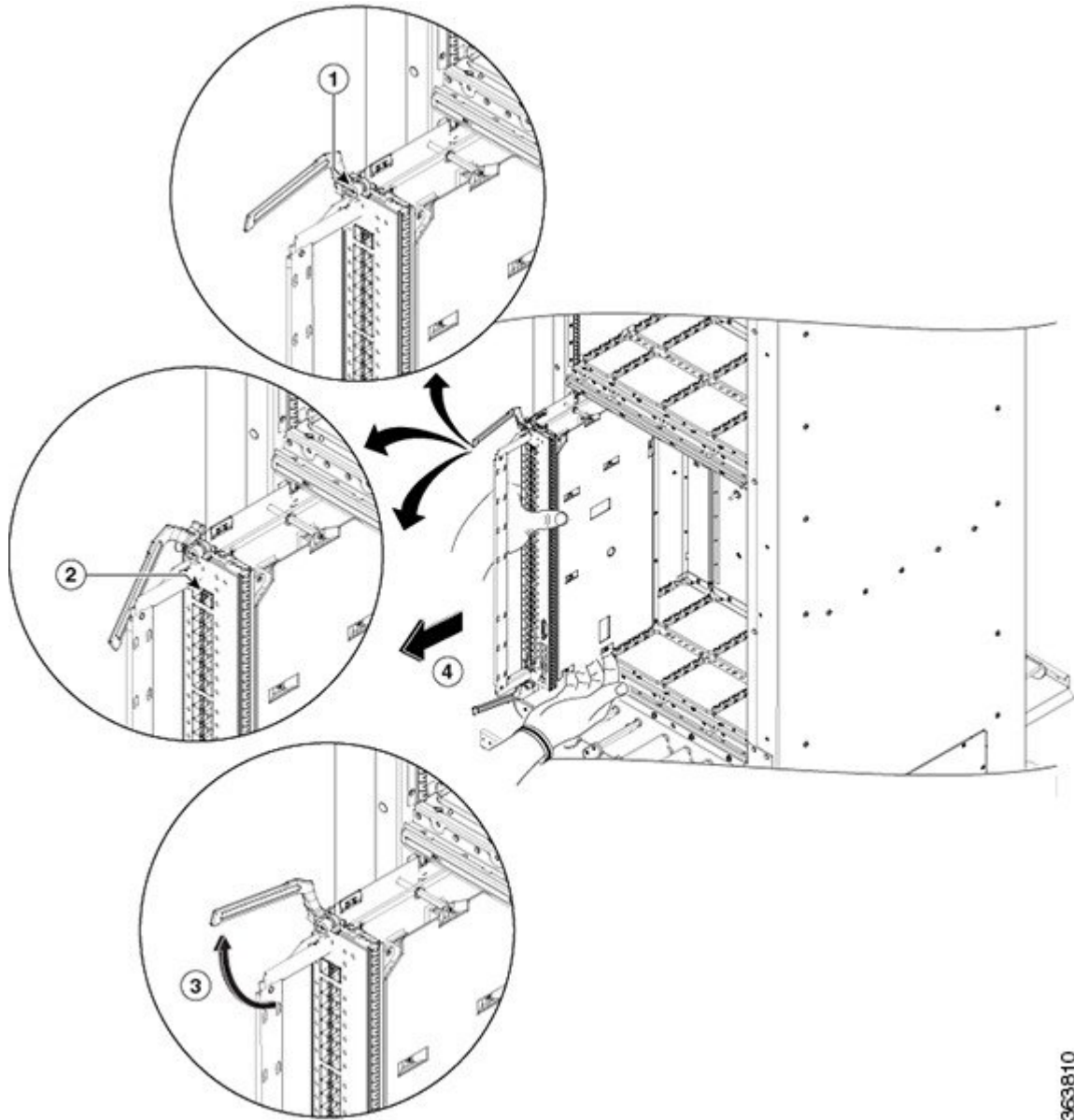
- ESD-preventive wrist strap
- Number-2 Phillips screwdriver or Number-2 common (flat-head) screwdriver

## Steps

To remove an SC or SC-SW card, follow these steps:

- 
- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to one of the two ESD jacks on the rear side of the FCC (see [Preventing Electrostatic Discharge](#)). You can also connect the ESD-preventive wrist strap leash to any bare metal surface on the FCC.
  - Step 2** Identify the card to be removed from the card cage. Remove any cables connected to the front panel of the card.
  - Step 3** Use the number-2 Phillips screwdriver or number-2 common (flat-head) screwdriver to turn the two captive screws on the front panel of the card counterclockwise to loosen the card from the slot.

*Figure 20: Removing a Shelf Controller Card—SC-SW Card Shown*



363810

1	Captive screw	3	Ejector lever
2	OIR button	4	Direction of removal

**Caution** To prevent ESD damage, handle the card by its ejector levers or the LC carrier edges only. Do not touch any of the electrical components, pins, or circuitry.



- Step 4** Press the OIR buttons on the top and bottom of the card faceplate to release the ejectors (SC-SW card only).
- Step 5** Simultaneously pivot the ejector levers away from the faceplate to release the card from the midplane connectors.
- Step 6** Grasp the two card ejector levers and simultaneously pivot both ejector levers 90 degrees away from the front edge of the card carrier to unseat the card from the backplane connector.
- Step 7** Grasp the ejector levers with both hands and gently pull the card halfway from the slot.
- Step 8** Move one hand under the card to guide it. Avoid touching the card’s printed circuit board, components, or any connector pins.
- Step 9** Touching only the metal card carrier, slide the card from the slot and place it directly into an antistatic sack or other ESD-preventive container. If you plan to return a defective card to the factory, repackage it in the shipping container that you received with the replacement card.

## Removing an S2 Fabric Card



**Note** Unless otherwise noted, the information in this section applies to the NCS-F-FC and NCS-F-FC2 fabric cards.

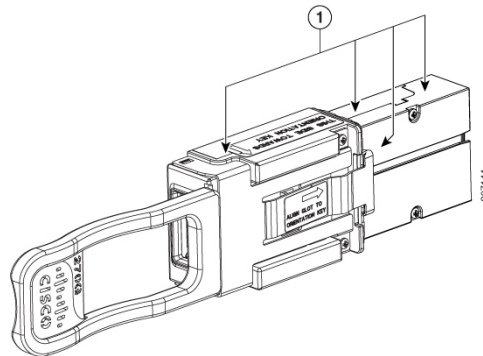
This section describes how to remove an S2 fabric card from the Cisco NCS 6000 FCC.

### Guidelines for Handling CXP2 Optical Modules



**Warning** **Hot surface.** Statement 1079

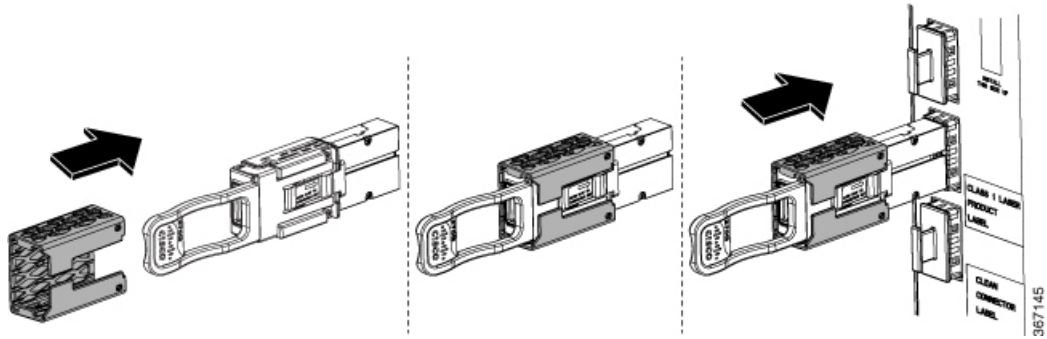
The metal surfaces on the CXP2 can run hot. Use caution when removing CXP2 optical modules from the second generation S2 Fabric Card (S2 FC2).



1	Metal surfaces
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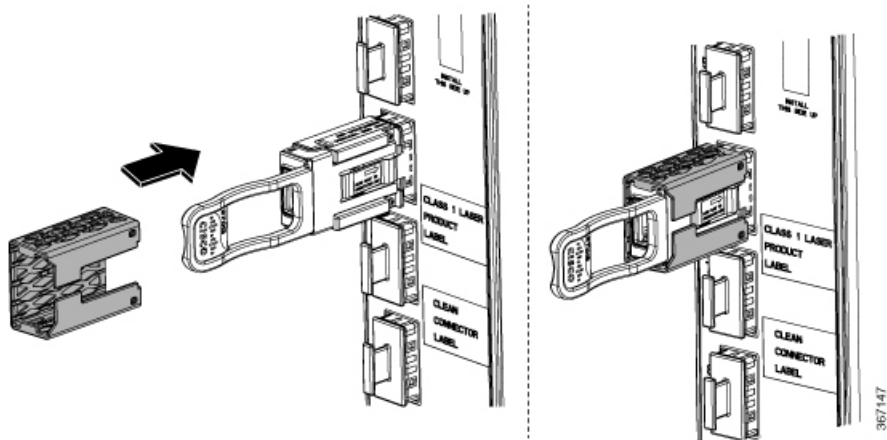
A thermoplastic sleeve is provided for each CXP2 port.

You can install the thermoplastic sleeve around the base of the CXP2 before you install the CXP2, as shown in the following figure.

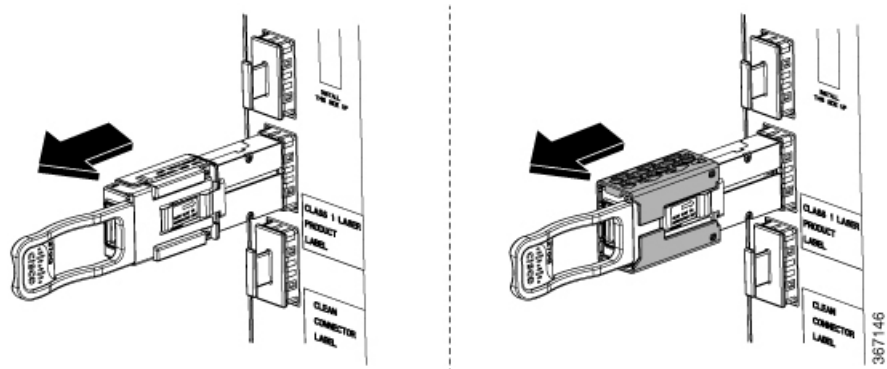


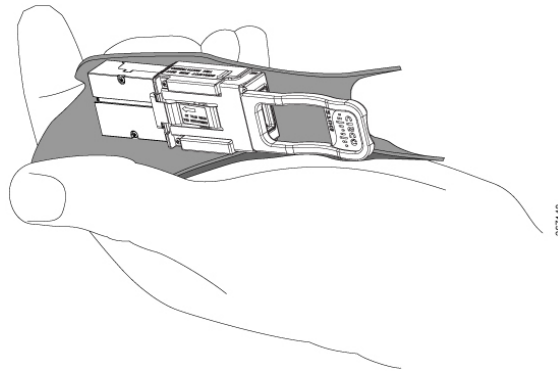
**Note** You can leave the sleeve on the CXP2 optical module while it is installed in the fabric card.

If a CXP2 is already installed, you can install the thermoplastic sleeve around the base of the CXP2 before you remove it from a transceiver socket, as shown in the following figure.



Alternatively, you can remove a CXP2 optical module (with or without the thermoplastic sleeve) and hold it in the provided silicon foam pad, as shown in the following figures.





## Prerequisites

The required prerequisites for removing an FC are:

- Identify the FC to be removed and check the fabric plane it is configured on.
- Shut down the fabric plane, if configured, to avoid traffic loss. The following example shows how to shut down plane X (where X is in the range of 0 to 3).

```
config
controller fabric plane X
shutdown
commit
```

- Open the chassis door.

## Required Tools and Equipment

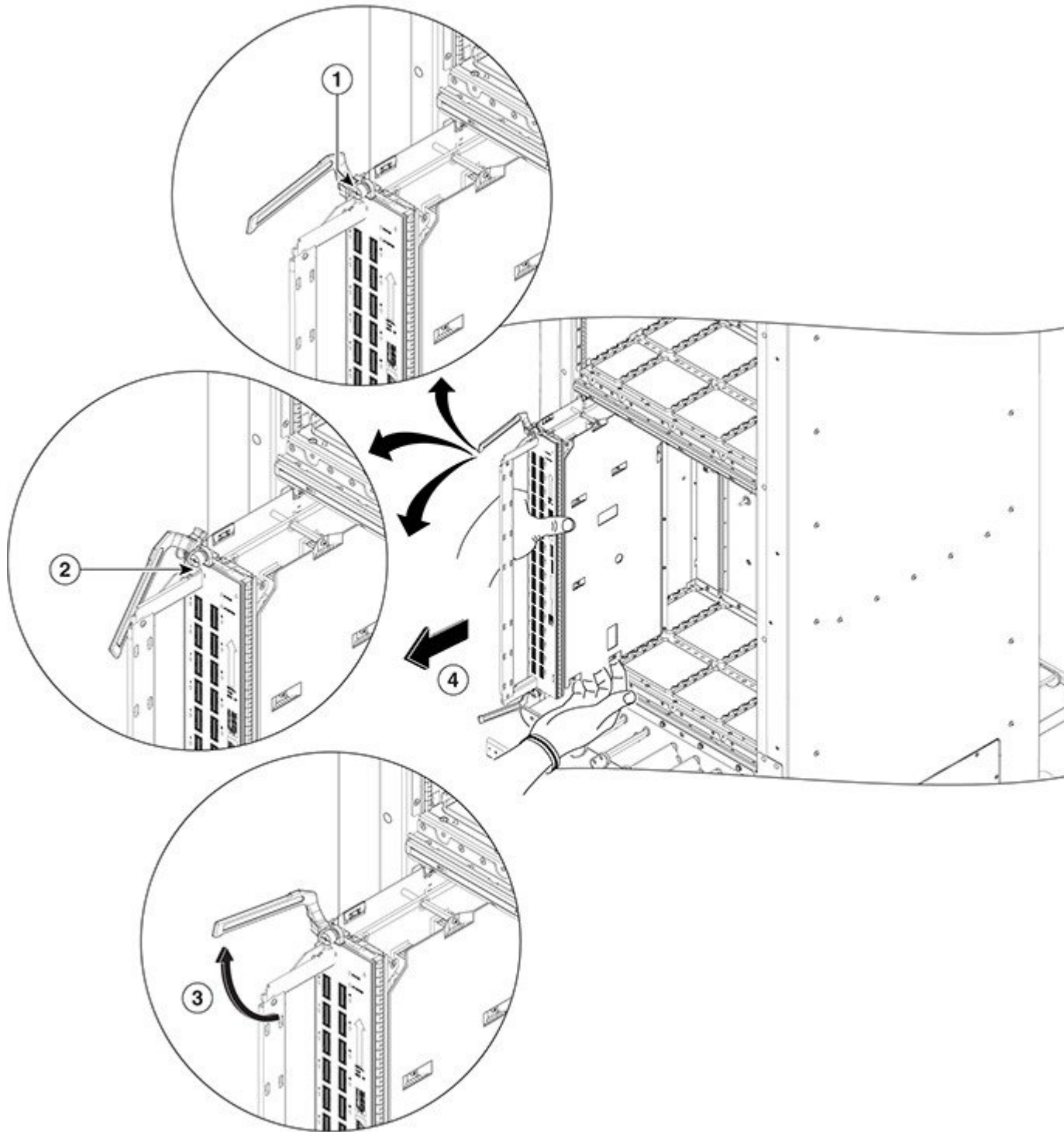
- ESD-preventive wrist strap
- Number-2 Phillips screwdriver or Number-2 common (flat-head) screwdriver

## Steps

To remove an S2 FC, follow these steps:

- 
- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to one of the two ESD jacks on the rear side of the FCC (see [Preventing Electrostatic Discharge](#)). You can also connect the ESD-preventive wrist strap leash to any bare-metal surface on the FCC.
- Step 2** Identify the card to be removed from the card cage. Use the number-2 Phillips screwdriver or number-2 common (flat-head) screwdriver to turn the two captive screws on the front panel of the card counterclockwise to loosen it from the slot.

*Figure 21: Removing an S2 FC*



1	Captive screw	3	Ejector lever
2	OIR button	4	Direction of removal

**Step 3** Press the OIR buttons on the top and bottom of the card faceplate to release the ejectors.

**Note** Wait for the S2 STATUS LED to turn to yellow. This indicates that the card is ready for removal.

**Step 4** Grasp the two card ejector levers and simultaneously pivot both ejector levers 70 degrees away from the front edge of the card carrier to unseat the card from the midplane connector.

Touching only the metal card carrier, slide the card from the slot and place it directly into an antistatic bag or other ESD-preventive container. If you plan to return the defective card to the factory, repackage it in its original shipping container.

## Removing an S13 Multi-Chassis Fabric Card

For information about removing a fabric card from the Cisco NCS 6008 LCC, see the [Cisco Network Convergence System 6000 Series Routers Hardware Installation Guide](#).

The procedures for removing the S13 fabric card are the same as those for removing the fabric cards defined in this guide.