



CHAPTER 6

Removing and Replacing Chassis Components

This chapter provides instructions on how to remove and replace components from the Cisco NCS 6008 chassis.

- [Removing the Exterior Cosmetics, page 6-35](#)
- [Removing the Power Components, page 6-37](#)
- [Replacing the Fan Trays and Air Filter, page 6-43](#)

Removing the Exterior Cosmetics

This section describes how to remove the front-side and rear side exterior cosmetics on the Cisco NCS 6008 chassis. We recommend that you remove the cosmetics in the order outlined in this section.

Prerequisites

Ensure that you have all the original packaging material for the cosmetic components available.

Required Tools and Equipment

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

Removing the Front Exterior Cosmetics

Steps

To remove the front exterior cosmetics, perform the following steps:

-
- Step 1** Remove the top and bottom front grilles by unsnapping them from the snap joiners on the chassis ([Figure 3-8 on page 3-10](#)).
 - Step 2** Remove the front doors.
 - a.** Open the doors and remove the grounding cables by loosening and removing the pan-head screws ([Figure 3-7 on page 3-9](#)).

- b. Lift the doors up and off the hinge attachment pins and pull away from the chassis.
- Step 3** Remove the door hinge attachments, three left and three right, by removing two pan-head screws each (Figure 3-5 on page 3-7).
- Step 4** Remove the front door alignment bracket above the craft display panel by loosening the captive screw and removing the two pan-head screws (Figure 3-3 on page 3-5).
- Step 5** Remove the front cable management brackets (Figure 3-3 on page 3-5).
- a. Remove the upper horizontal bracket (above the LC cage) by loosening and removing the four pan-head screws.
 - b. Remove the lower horizontal bracket (below the LC cage) by loosening and removing the five pan-head screws.
- Step 6** Remove the left and right vertical cable troughs from the front of the chassis (Figure 3-3 on page 3-5) by using the screwdriver to loosen the 16 pan-head screws counterclockwise and remove them from the cable troughs.



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.

- Step 7** If necessary, remove the craft panel located on the front of the chassis. Usually it is not necessary to remove this panel. The craft panel (Cisco PID NCS-CRFT=) is a field replaceable unit.
- a. Loosen the four captive screws on the craft display panel.
 - b. Pull the craft display panel away from the chassis to remove.
 - c. Loosen the four captive screws on the sheet metal craft panel.
 - d. Pull the craft panel away from the chassis to remove.
-

Removing the Rear Exterior Cosmetics



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

Steps

To remove the rear cosmetics, perform the following steps:

-
- Step 1** Remove the exhaust air deflector by carefully pulling its mounting tabs away from the brackets on the vertical cable troughs (Figure 3-12 on page 3-16).
- Step 2** Remove the Rear Doors
- a. Open the doors and remove the grounding cables by loosening and removing the pan-head screws (Figure 3-7 on page 3-9).
 - b. Lift the doors up and off the hinge attachment pins and pull away from the chassis (Figure 3-11 on page 3-15).

- Step 3** Remove the door hinge attachments, three left and three right, by removing the two pan-head screws each (Figure 3-10 on page 3-14).
- Step 4** Remove the power cable brackets by loosening and removing the two pan-head screws on each end of the bracket (Figure 3-9 on page 3-12).
- Step 5** Remove the exhaust plenum bracket by removing the eight pan-head screws (4 on each side) (Figure 3-9 on page 3-12).
- Step 6** Remove the top cap from the top of the chassis by removing the four screws from the tops of the vertical cable troughs (Figure 3-9 on page 3-12).
- Step 7** Remove the rear door alignment bracket by loosening the captive screw and removing the two pan-head screws (Figure 3-9 on page 3-12).
- Step 8** Remove the rear cable management brackets (Figure 3-9 on page 3-12).
- Remove the lower horizontal bracket (below the FC and RP card cage) by loosening and removing the four pan-head screws.
 - Remove the upper horizontal bracket (above the FC and RP card cage) by loosening and removing the six pan-head screws.
- Step 9** Remove the left and right vertical cable troughs (Figure 3-9 on page 3-12) by using the screwdriver to loosen the 16 pan-head screws counterclockwise and remove them from the cable troughs.



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.

Removing the Power Components

This section describes how to remove power components from the Cisco NCS 6008 chassis.



Note Although there are differences between AC and DC power trays and PMs, they are removed using the same procedures.

While it is possible to remove power components from the Cisco NCS 6008 chassis separately, some parts (such as the power tray) 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, page 6-38](#)
- [Removing DC Input Power Cables, page 6-38](#)
- [Removing a Power Module Slot Cover, page 6-39](#)
- [Removing an AC or DC Power Module, page 6-40](#)
- [Removing an AC or DC Power Tray, page 6-41](#)
- [Removing the Chassis Ground Cable, page 6-43](#)

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 chassis. Power off the AC PMs in the tray 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 chassis and perform the following steps:

-
- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to one of the two ESD connection sockets ([Figure 2-6 on page 2-9](#)) on the rear of the chassis. You can also connect the ESD-preventive wrist strap leash to any bare metal surface on the chassis.
- 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 ([Figure 4-24 on page 4-26](#)).
- Step 4** Remove the cords from the cord clamps.
-

Removing DC Input Power Cables

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

Prerequisites

Remove the exhaust air deflector from the rear of the chassis. Power off the DC PMs in the tray you want to disconnect.

**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 DC input power cables, go to the rear of the chassis and perform the following steps:

-
- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to one of the two ESD connection sockets ([Figure 2-6 on page 2-9](#)) on the rear of the chassis. You can also connect the ESD-preventive wrist strap leash to any bare metal surface on the chassis.
- Step 2** 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 screw that secures the terminal block cover into the mounting standoff.
- 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 it should be wrapped with standard black electrical tape.

- Step 7** Replace the terminal block cover.
-

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 chassis, if installed (see the [“Removing the Front Exterior Cosmetics”](#) section on page 6-35).

Steps

To remove a PM slot cover from the front of a power tray, perform the following steps:

-
- 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 4-23 on page 4-24](#)).
-

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 chassis, if installed (see the [“Installing the Front Exterior Cosmetics” section on page 3-4](#)).

**Note**

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.

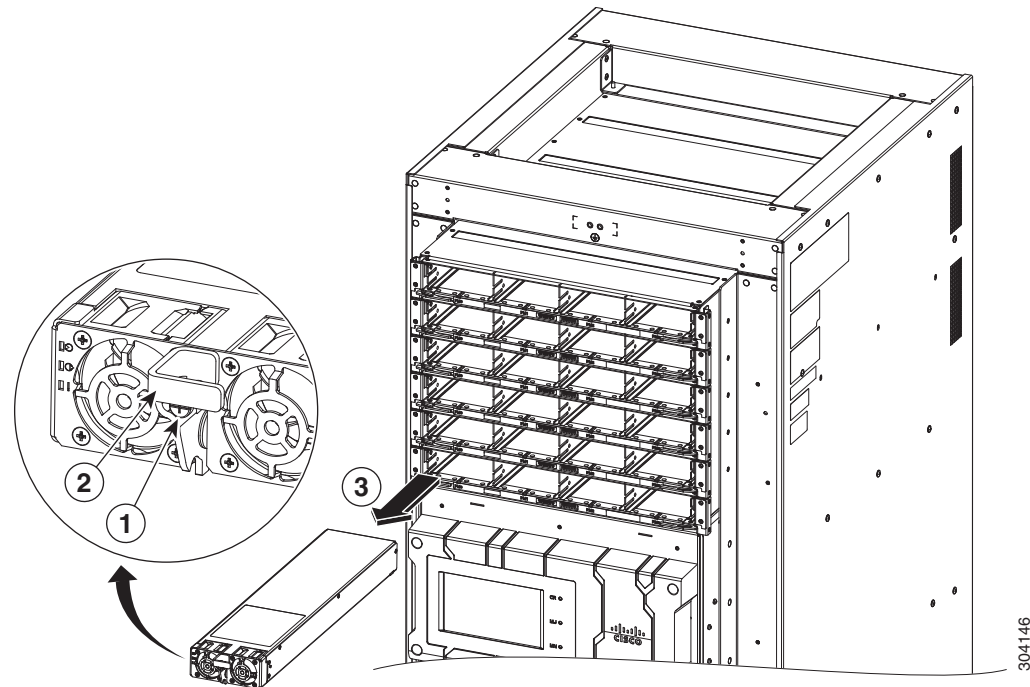
Required Tools and Equipment

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

Steps

To remove a power module from the front of a power tray, perform the following steps:

-
- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to the ESD connection socket on the front side of the chassis ([Figure 2-5 on page 2-8](#)). You can also connect the ESD-preventive wrist strap leash to any bare metal surface on the chassis.
- Step 2** Using the screwdriver, unscrew the ejector lever screw ([Figure 6-1](#)).

Figure 6-1 Removing a PM from a Power Tray

1	Ejector lever screw
2	Ejector lever
3	Slide the PM out

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 an AC or DC Power Tray

This section describes how to remove a power tray from the Cisco NCS 6008 chassis.



Note

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

Prerequisites

- 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.
- Completely power off the entire system at the supply circuit breakers before installing a power tray.
- Remove the top grilles from both the front and rear sides of the chassis, if installed.

- Ensure the power tray you are about to install is empty. 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.



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

Required Tools and Equipment

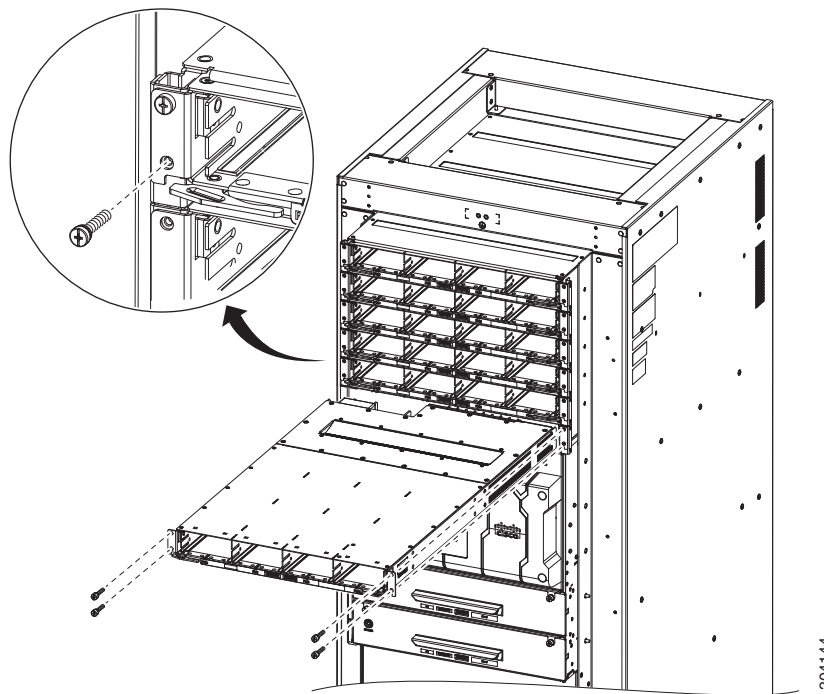
- 6-inch, number-2 Phillips screwdriver

Steps

To remove an AC or DC power tray, perform the following steps:

- Step 1** Use the screwdriver to loosen the four M4 x 10 mm screws that attach the power tray to the chassis (Figure 6-2).

Figure 6-2 Removing a Power Tray from the Chassis



- Step 2** Pull both the left and right ejector handles out at the same time to eject the power tray from the chassis. Slide the power tray all the way out of the chassis.



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

**Caution**

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

Removing the Chassis Ground Cable

This section describes how to remove the chassis ground cable on the Cisco NCS 6008 chassis.

Prerequisites

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

**Caution**

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

Required Tools and Equipment

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

Steps

To remove the ground cable from the chassis, remove the two M6 bolts that attach the ground cable to the NEBS grounding point ([Figure 2-5 on page 2-8](#)).

Replacing the Fan Trays and Air Filter

**Note**

The chassis is shipped with the two fan trays and an air filter preinstalled.

- [Removing the Power Components, page 6-37](#)
- [Replacing Air Circulation Components, page 6-46](#)

Information About the Air Circulation Components

- [About the Fan Trays, page 6-44](#)
- [About the Air Filter, page 6-46](#)

About the Fan Trays

The Cisco NCS 6008 chassis has two fan trays ([Figure 6-3](#)) above the card cage.

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 chassis, the other fan tray will immediately spin up to maximum speed in order 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 CLI message warning you to install a fan tray or the entire chassis will shut down in 45 seconds.



Note

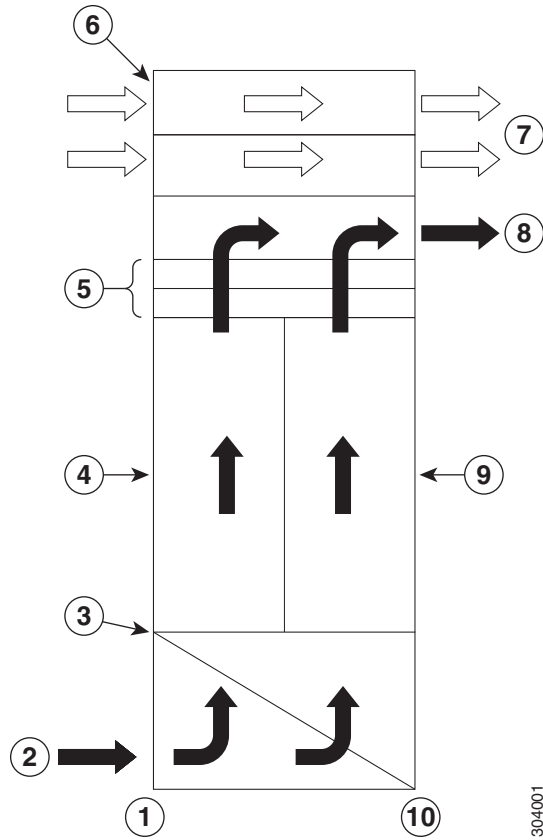
The upper and lower fan trays are interchangeable and installed in the same manner.

The green/yellow LED will light when the fan tray is inserted. [Table 6-1](#) describes the fan tray LED.

Table 6-1 Fan Tray LED

State	Description
Green	The fan tray is operating normally.
Yellow	The fan tray has one or more errors detected.
Off	No power is applied to the fan tray.

Figure 6-3 Airflow Through the Cisco NCS 6008 Chassis



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1	Front side of chassis	6	Air flow through PMs
2	Air inlet plenum	7	Exhaust air from PMs
3	Air filter	8	Air exhaust plenum
4	Front cage for LCs	9	Rear cage for FCs and RP cards
5	Fan trays	10	Rear side of chassis

About the Air Filter

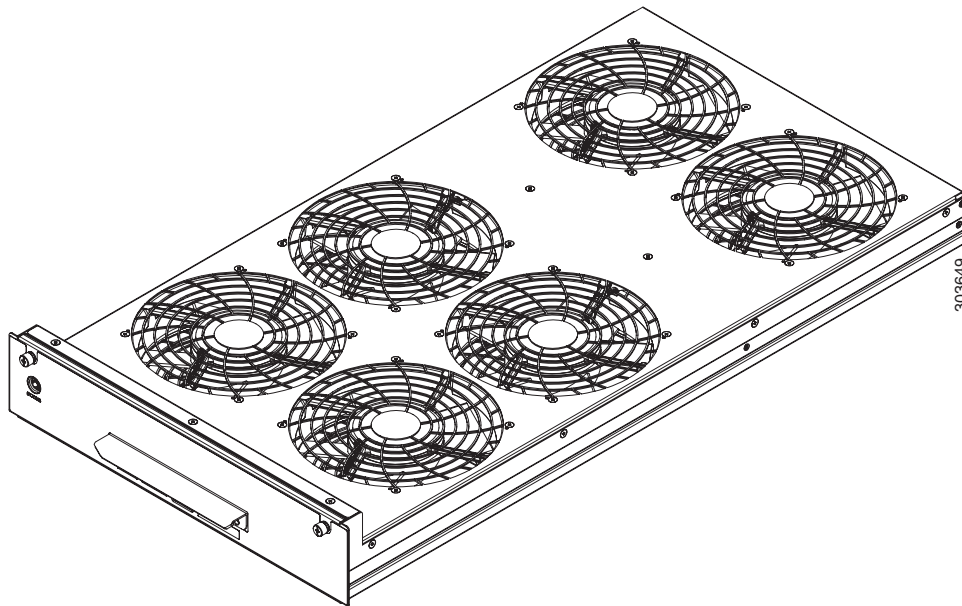
The chassis has a serviceable air filter mounted in a slide-out tray accessible from the front of the chassis just below the card cage (Figure 6-3). The air filter removes dust from the room air drawn into the chassis by the two fan trays. Once a month (or more often in dusty environments), you should examine the air filter. Clean the air filter with forced air, a clean towel, or water. Replace it if it appears excessively dirty or damaged. Failure to clean or replace a compromised air filter can result in insufficient air circulation through the chassis and temperature-related environmental alarms.

Replacing Air Circulation Components

- [Replacing the Fan Tray, page 6-46](#)
- [Replacing the Air Filter, page 6-48](#)

Replacing the Fan Tray

Figure 6-4 Fan Tray



Prerequisites

Before performing this task, open the 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, perform the following steps:

-
- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to the ESD connection socket on the front side of the chassis (Figure 2-5 on page 2-8). You can also connect the ESD-preventive wrist strap leash to any bare metal surface on the chassis.
- 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. You should be especially careful while removing the fan tray from the chassis. 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 chassis. 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 (label is on top).
- Step 7** Slide the fan tray into the fan tray bay. Stop when the fan tray makes contact with the chassis connector in the back of the fan tray bay.



Caution To prevent damage to the chassis 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 chassis connector. When completely seated, the fan tray faceplate flanges meet the rear side of the chassis.



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.

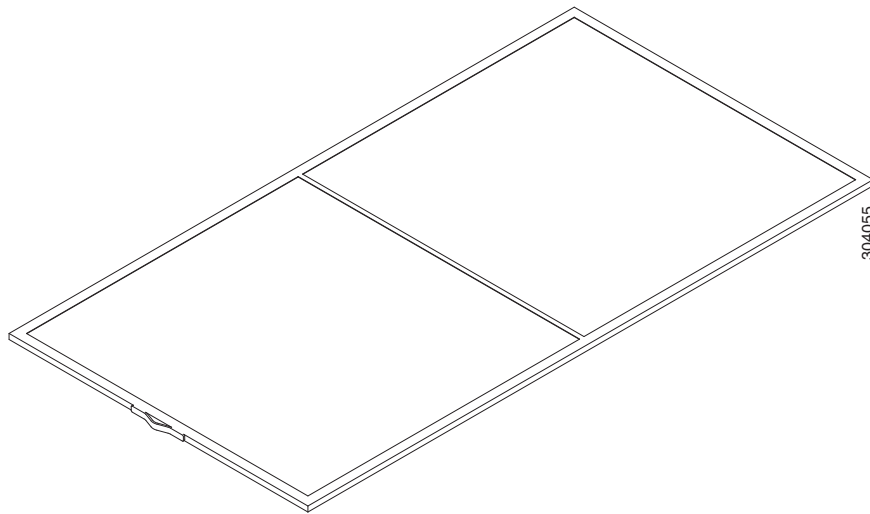
- Step 9** Tighten the two captive screws on the fan tray faceplate.
-

Replacing the Air Filter


Note

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

Figure 6-5 **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

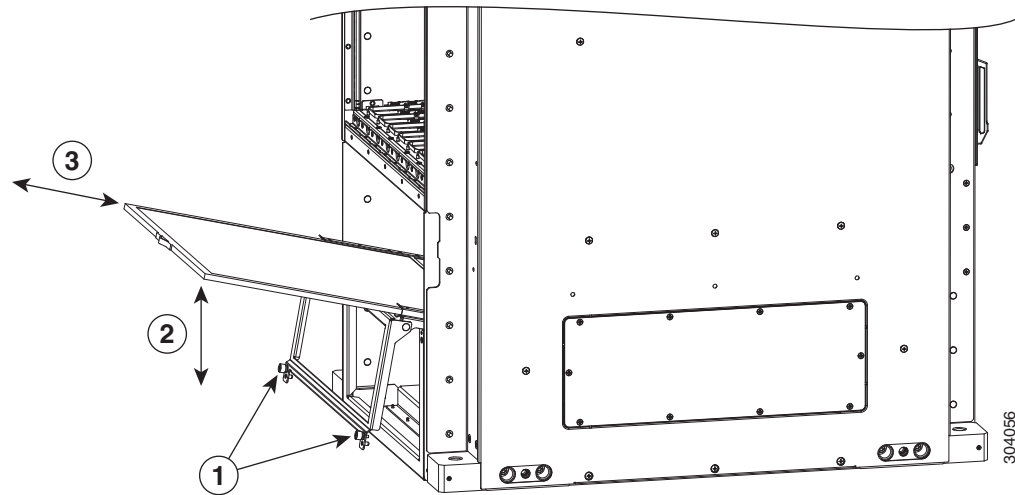
Never operate the Cisco NCS 6008 chassis without an air filter. Operating a Cisco NCS 6008 chassis without a filter for an extended time can result in damage to the chassis hardware. Required Equipment

Steps

To replace the air filter, perform the following steps:

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- Step 1** Remove the lower grille, if installed.
 - Step 2** Loosen the two captive screws on the filter cover (Figure 6-6). Pull outward on the center of the filter door to pull it free. The filter will automatically drop down.

Figure 6-6 Replacing the Air Filter—Front Side of Chassis



1	Captive screws	3	Slide old air filter out, slide new air filter in.
2	Pull outward and swing down to access filter, swing up and push in after replacement.		

Step 3 Grasp the pull tab at the front of the old air filter, and slide it out from the slot.

Step 4 Slide the new air filter into the slot.



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.

Step 5 Swing up and push in the filter cover.

Step 6 Tighten the two captive screws on the front.

