



# Installing and Removing Air Circulation Components

This chapter provides instructions on how to replace the Cisco CRS Carrier Routing System Fabric Card Chassis (FCC) air circulation components.



## Note

The chassis is shipped with the fan trays and air filter pre-installed.

- [Information About the Air Circulation Components, page 1](#)
- [How to Install and Remove Air Circulation Components, page 3](#)

## Information About the Air Circulation Components

This section contains some general information about the air circulation components in the following topics:

- [About the Fan Trays, on page 1](#)
- [About the Air Filter, on page 3](#)

## About the Fan Trays

The FCC has two fan trays (see figure below), one just below the lower card cage and the other just above the upper card cage. The chassis can run with only one fan tray operating. If a failure occurs in one fan tray, the other fan tray acts as the redundant fan tray to assure fault-tolerant system performance; the chassis continues to operate while the failed fan tray is replaced.

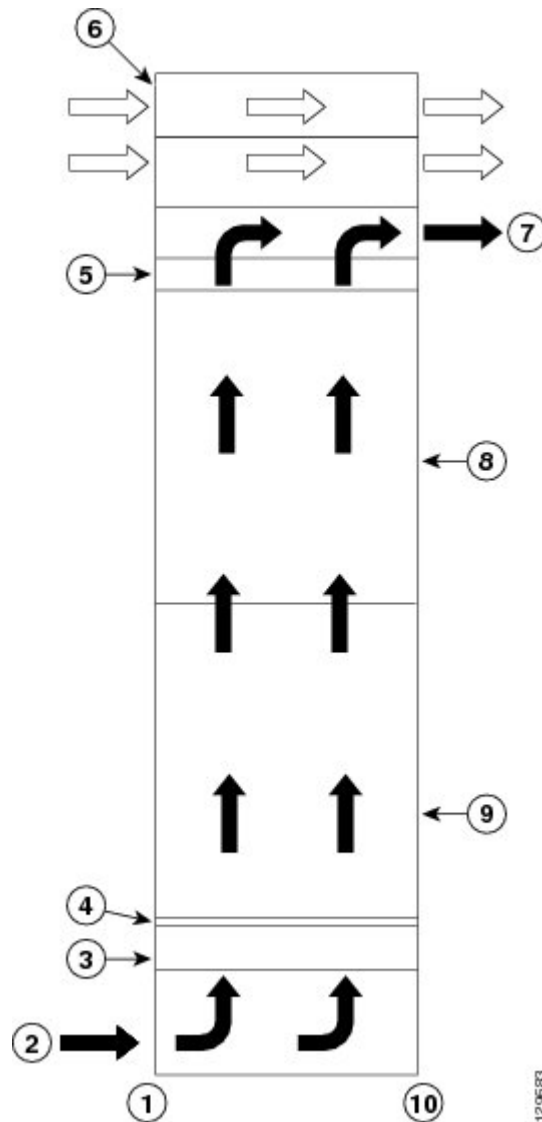
The FCC fan tray operates in either the upper or lower fan tray slots. Each fan tray installs into the front (SFC) side of the chassis and contains:

- Nine fans
- Fan tray board
- Front-panel status LED

**Note**

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

**Figure 1: Chassis Air Circulation, Side View**



1	Front (SFC) side of chassis	6	Power shelves (two)
2	Air intake	7	Air exhaust
3	Lower fan tray	8	Upper card cage
4	Air filter	9	Lower card cage

5	Upper fan tray	10	Rear (OIM) side of chassis
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## 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 lower card cage (see [Figure 1: Chassis Air Circulation, Side View, on page 2](#)). The air filter removes dust from the room air drawn into the router by the two fan trays. Once a month (or more often in dusty environments) you should examine the air filter and replace it if it appears damaged or excessively dirty.



### 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.



### Caution

Periodic maintenance of the air filter is required to maintain proper air flow in the system as well as to avoid optical contamination. It is highly recommended to clean air filters once in three months and also replace the air filter once in a year.

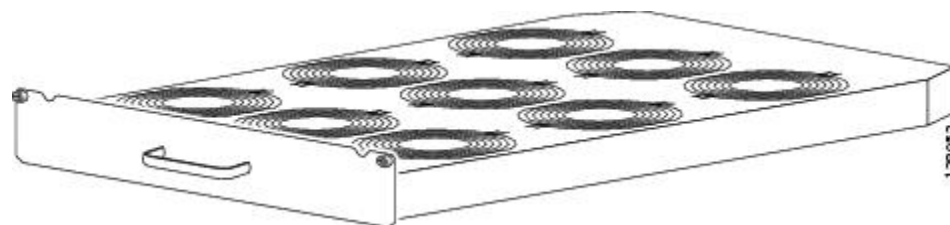
## How to Install and Remove Air Circulation Components

This section contains the following procedures:

### Replacing a Fan Tray

This section describes how to replace a fan tray (see figure below) in the FCC. For information on the fan tray, see the [Information About the Air Circulation Components, on page 1](#).

**Figure 2: Fan Tray**



### Prerequisites

Before performing this task, you must first open the doors on the front (SFC) side of the chassis. If you are replacing the upper fan tray, you must remove the logo bezel from the front (SFC) side of the chassis. If you are replacing the lower fan tray, you must remove the lower grille from the front (SFC) side of the chassis.

## Required Tools and Equipment

You need the following tools and part to perform this task:

- ESD-preventive wrist strap
- 6-in.long number 1 Phillips screwdriver
- Fan tray (Cisco product number CRS-FCC-FAN-TR=)

## Steps

To replace a fan tray, perform the following steps:

### SUMMARY STEPS

1. Attach the ESD-preventive wrist strap to your wrist and connect its leash to an ESD connection socket on the front of the chassis or to a bare metal surface on the chassis.
2. Using the screwdriver, loosen the two captive screws on the fan tray cover faceplate.
3. Grasp the fan tray handle and pull it straight out to disconnect the fan tray from the chassis backplane connector at the back of the fan tray slot. Slide the fan tray halfway from the fan tray slot.
4. Use your free hand to support the bottom of the fan tray, then slide the fan tray completely from the fan tray slot.
5. Set the fan tray carefully aside.
6. To install the replacement fan tray, using two hands to support the fan tray, position it in front of the fan tray slot so that the fan tray connector that is recessed into the back of the fan tray is aligned with the connector mounted in the back corner of the fan tray slot.
7. Slide the fan tray into the fan tray slot. Stop when the fan tray makes contact with the chassis connector in the back of the fan tray slot.
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 front of the chassis.)
9. Tighten the two captive screws on the fan tray faceplate.

### DETAILED STEPS

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| <b>Step 1</b>  | Attach the ESD-preventive wrist strap to your wrist and connect its leash to an ESD connection socket on the front of the chassis or to a bare metal surface on the chassis.  |
| <b>Step 2</b>  | Using the screwdriver, loosen the two captive screws on the fan tray cover faceplate.   |
| <b>Caution</b> | Because of the weight of the fan tray, approximately 44 lb (20 kg), 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 3** Grasp the fan tray handle and pull it straight out to disconnect the fan tray from the chassis backplane connector at the back of the fan tray slot. Slide the fan tray halfway from the fan tray slot.
- Step 4** Use your free hand to support the bottom of the fan tray, then slide the fan tray completely from the fan tray slot.
- Step 5** Set the fan tray carefully aside.
- Step 6** To install the replacement fan tray, using two hands to support the fan tray, position it in front of the fan tray slot so that the fan tray connector that is recessed into the back of the fan tray is aligned with the connector mounted in the back corner of the fan tray slot.
- Caution** Because of the weight of the fan tray, approximately 44 lb (20 kg), you should be especially careful while installing the fan tray in 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 install or remove the fan tray rather than a single person. After two people have placed the power shelf in position, one person can slide it into place.
- Step 7** Slide the fan tray into the fan tray slot. Stop when the fan tray makes contact with the chassis connector in the back of the fan tray slot.
- Caution** To prevent damage to the chassis connector, do not use excessive force when inserting a fan tray into its slot.
- 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 front of the chassis.)
- Note** All electrical and control line connections are made automatically when the connectors mate.
- Step 9** Tighten the two captive screws on the fan tray faceplate.
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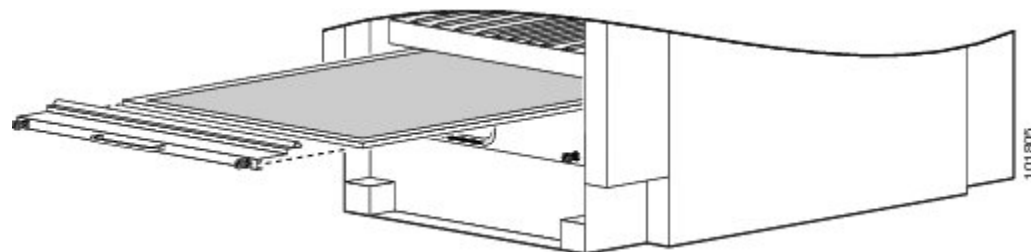
## What to Do Next

After performing this task, close the doors and replace the upper or lower grille on the front (SFC) side of the chassis. For more information, see the [How to Install and Remove Air Circulation Components](#), on page 3.

## Replacing the Air Filter

This section describes how to replace the air filter (see figure below) in the FCC. For further information, see the [Information About the Air Circulation Components](#), on page 1.

**Figure 3: Air Filter**



## Prerequisites

Before performing this task, you must first open the doors and remove the lower grille on the front (SFC) side of the chassis.

## Required Tools and Equipment

You need the following tools and part to perform this task:

- ESD-preventive wrist strap
- 6-in. long number 1 Phillips screwdriver
- Air filter (Cisco product number CRS-FCC-FILTER=)

## Steps

To replace the air filter, perform the following steps:

### SUMMARY STEPS

1. Attach the ESD-preventive wrist strap to your wrist and connect its leash to an ESD connection socket on the front of the chassis or to a bare metal surface on the chassis.
2. Use the screwdriver to loosen the captive screws (one on each side of the air filter door) that fasten the air filter door to the chassis.
3. Remove the air filter door and set it carefully aside.
4. Grasp the retractable plastic handle at the front of the air filter and carefully slide out the air filter.
5. Set the air filter carefully aside.
6. To install the replacement air filter, using two hands to support the air filter, orient it so that the retractable plastic handle on the front of the air filter faces outward from the front of the chassis.
7. Align the replacement air filter with the air filter slot.
8. Slide the air filter into the air filter slot until it is fully within the bay.
9. Place the air filter door over the air filter slot and, using the screwdriver, tighten the two captive screws that attach the door to the chassis.

## DETAILED STEPS

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- Step 1** Attach the ESD-preventive wrist strap to your wrist and connect its leash to an ESD connection socket on the front of the chassis or to a bare metal surface on the chassis.
- Step 2** Use the screwdriver to loosen the captive screws (one on each side of the air filter door) that fasten the air filter door to the chassis.
- Step 3** Remove the air filter door and set it carefully aside.
- Step 4** Grasp the retractable plastic handle at the front of the air filter and carefully slide out the air filter.
- Step 5** Set the air filter carefully aside.
- Step 6** To install the replacement air filter, using two hands to support the air filter, orient it so that the retractable plastic handle on the front of the air filter faces outward from the front of the chassis.
- Step 7** Align the replacement air filter with the air filter slot.
- Step 8** Slide the air filter into the air filter slot until it is fully within the bay.
- Step 9** Place the air filter door over the air filter slot and, using the screwdriver, tighten the two captive screws that attach the door to the chassis.
- Caution** All four edges of the air filter door are lined with EMI-preventive gaskets consisting of many raised, conductive contacts. Align and seat the door carefully to avoid damage to the EMI-preventive gaskets. A damaged gasket can result in reduced EMI performance.
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## What to Do Next

After performing this task, replace the lower grille and close the doors on the front (SFC) side of the chassis. For more information, see the [How to Install and Remove Air Circulation Components](#), on page 3.

