Doc. No. 78-4956-02

# Cisco 12008 Gigabit Switch Router Switch Card Replacement Instructions

**Product Numbers: GSR8-CSC= and GSR8-SFC=**
**Document Order Number: DOC-784956=**

This document provides replacement procedures for the clock and scheduler card (CSC) and the switch fabric card (SFC), which are the two types of switch cards used in the Cisco 12008 Gigabit Switch Router (GSR). The document contains the following sections:



Use this document in conjunction with the *Cisco 12008 Gigabit Switch Router Installation and Configuration Guide* (document number 78-4953-xx), which shipped with your Cisco 12008 Gigabit switch router.

## Installation Safety, ESD Precautions, and Required Tools

Before replacing any switch cards in the upper or lower card cage of the Cisco 12008, review the following safety guidelines to prevent injury to yourself or damage to the equipment. This section also lists the tools that you will need to perform the switch card replacement procedures.

**Corporate Headquarters**
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA

# Safety Guidelines

Observe the following guidelines to ensure your safety and protect the equipment. This list does not identify all of the potentially hazardous situations that you may encounter in the workplace, so *be alert and exercise care* when working with any of the switch router's electrical or electronic components.

- Always disconnect all power cords and line card interface cables before moving the Cisco 12008.
- Keep tools and switch router components away from walkway areas.
- Do not work alone if potentially hazardous conditions exist in the work area.
- Do not take any action that poses a potential hazard to yourself, other personnel, or the equipment.
- Carefully examine your work area for potential hazards, such as damp floors, ungrounded power extension cables, and missing safety grounds.

## Safety with Electricity

Observe the following basic safety guidelines when working with the switch router's electrical and electronic equipment:

- Before beginning any procedure requiring access to the card cages or other interior switch router components, locate the emergency power-off switch for the room in which you will be working.
- Do not work alone if potentially hazardous conditions exist in your work area.
- Never assume that power has been disconnected from a circuit; always verify that power has been removed before working on the switch router.
- Do not perform any action that poses a potential hazard to yourself, other personnel, or the equipment.
- Carefully examine your work area for possible hazards, such as damp floors, ungrounded power extension cables, and missing safety grounds.

In addition, observe the following guidelines when you are working with equipment connected to telephone wiring or other network cabling.

**Warning** Do not work on the system or connect or disconnect cables during lightning storms.

- Never install telephone jacks in wet or damp locations unless the jack is specifically designed for use in such areas.
- Never touch uninsulated telephone wires or terminals unless telephone lines are disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

## Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage to circuit boards can occur if they are handled improperly. Such mishandling can result in intermittent or complete failures of the board.

When handling circuit boards, observe the following guidelines to prevent ESD damage:

- Always use an ESD-preventive wrist strap and ensure that the strap makes adequate contact with your skin. Connect the equipment end of the strap (the banana jack) into the ESD socket on the lower left edge of the chassis.
- If you intend to return a faulty circuit board to the factory for repair or replacement, immediately place the board in an antistatic bag to prevent ESD damage to the board.
- The wrist strap protects equipment from ESD voltages on the body only; ESD voltages on clothing can still cause damage to electronic components.

**Caution** For safety, periodically check the resistance value of the antistatic wrist strap. The resistance measurement should be between 1 and 10 megohms.

## Required Tools and Parts

You need the following tools and parts if you want to install or replace a switch card:

- 1/4-inch flat-blade screwdriver
- ESD-preventive wrist strap
- GSR8-CSC(=)—Clock and schedular card (CSC)
- GSR8-SFC(=)—Switch fabric card (SFC)

# Replacing Switch Cards

This section describes the procedures for removing, installing, and verifying the installation of the Clock and schedular card (CSC) and the Switch fabric card (SFC) for the Cisco 12008.

**Note** The Cisco 12008 switch cards cannot be used in any other member of the GSR family of Internet Routers.

The Cisco 12008 supports online insertion and removal of electronic components; thus, you can remove and replace a CSC or an SFC without powering down the system.

**Note** If you do not have a fully-redundant Cisco 12008 (one CRC only), you must power down the system, by shutting off the power supply, before removing the CSC card.

When you install a new CSC or SFC, the switch router's online insertion and removal (OIR) capability enables the new card to be recognized, initialized, and made fully operational in a transparent manner.

**Note** Four switch planes must be operable in the switch router at all times in order for the switch router to maintain an OC-48 data rate. Cisco Systems recommends that you have a fifth (redundant) switch plane, which can take over in the event of failure of any one of the other switch planes in the switch router.

In the following procedures, it is assumed that you intend to remove and replace a switch card from a fully redundant and operational Cisco 12008.

While you are replacing the failed card, only four switch planes remain available to the switch router. For the duration of the replacement procedure, no redundant switch plane exists to take over if any other switch plane should fail.

In a fully configured system, there is no conventional operating scenario under which you would leave either a CSC or an SFC slot vacant for any substantial length of time, beyond the time it takes to replace a failed card.

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**Note** If you remove a CSC (or any other card) from the upper card cage and do not replace it, you must install a blank filler panel in its place to maintain the integrity of the switch router enclosure. See the section "Installing/Removing a Blank Filler Panel" on page 11 .

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Two dedicated slots (CSC 0 and CSC 1) in the middle of the upper card cage are reserved for the exclusive use of the clock and scheduler card (CSC). The standard router configuration calls for one CSC to be installed in either one of two dedicated slots in the upper card cage; for redundancy, you can install a second (optional) CSC in the adjacent slot to provide redundancy of function in the event of failure of either card. There are three dedicated slots (SFC 0, SFC 1, and SFC 2) in the lower card cage for the three SFCs.

## Removing an SFC

To remove an SFC from the Cisco 12008, perform the following steps.

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**Note** Before accessing any of the switch router's internal components, put on an antistatic wrist strap and make sure that it makes adequate contact with your skin. Insert the equipment end of the wrist strap (the banana jack) into the ESD socket on the lower left edge of the upper card cage (see Figure 1).

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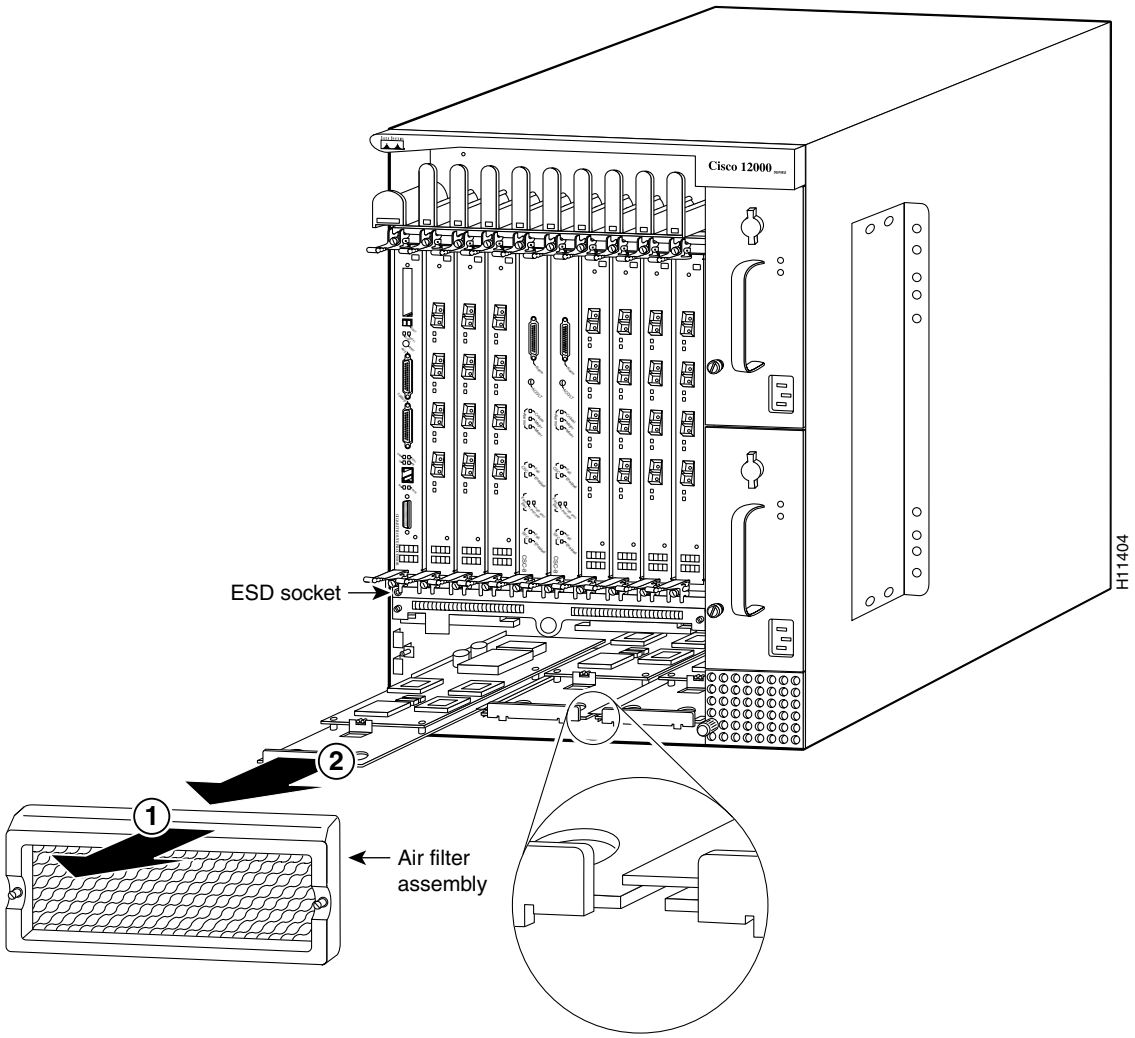
**Step 1** Loosen the two panel fastener screws on each side of the air filter assembly (see Figure 1); remove the assembly and set it aside.

**Figure 1 Removing an SFC**




**Step 2** Grasp the front of the card carrier's metal faceplate, unseat the card from the backplane, and slide the SFC out of the slot; supporting the weight of the card by placing your other hand underneath the card carrier. Store the SFC in an antistatic bag or in an antistatic card rack.

**Step 3** If you intend to return the card for repair or replacement, leave the card in its antistatic bag and prepare a return package for shipment.

**Caution** Do not place any tools in the lower card cage. Also, be careful not to damage the honeycomb screen in the air filter assembly. Damaging this screen can restrict the flow of cooling air through the switch router, causing an overtemperature condition.

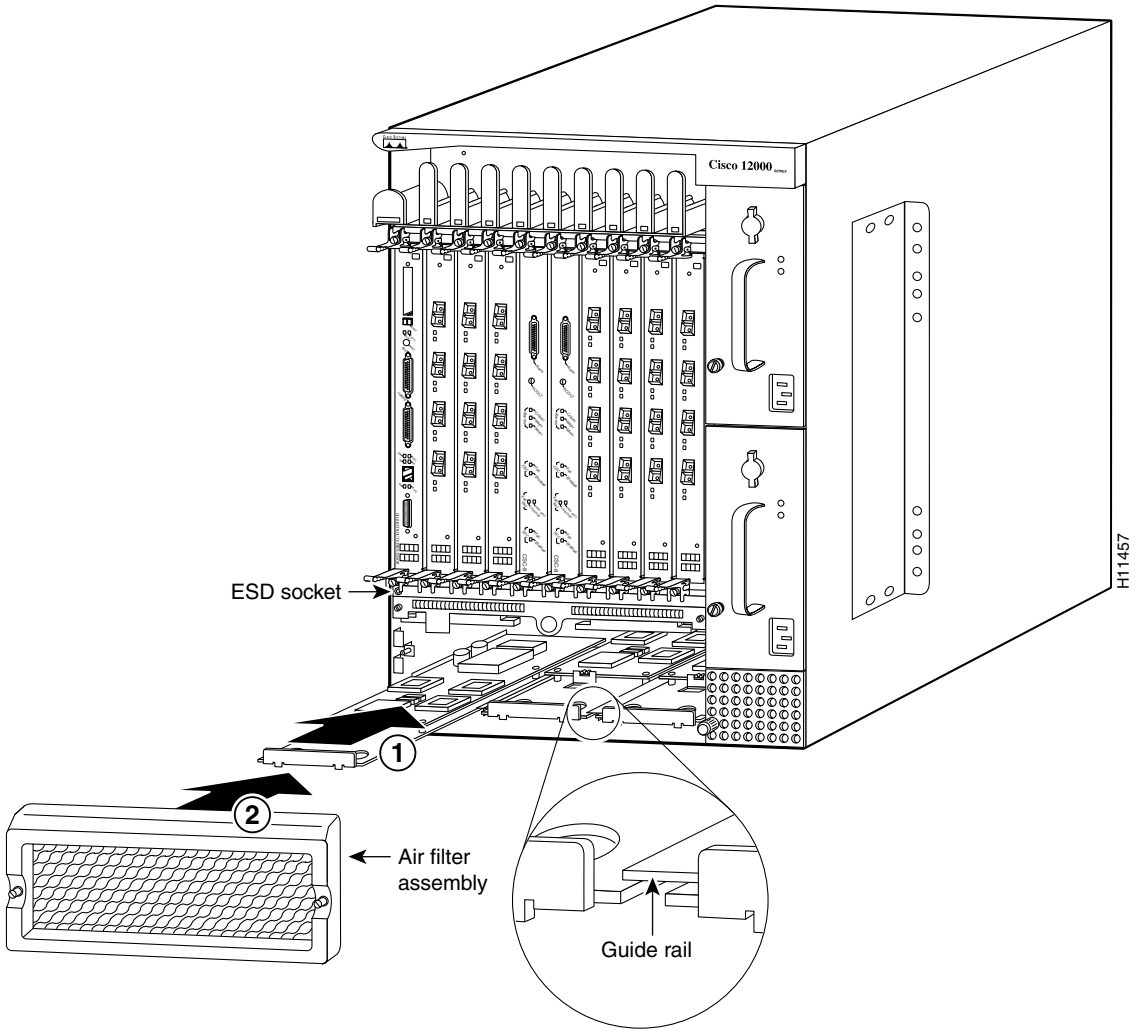
# Installing an SFC

To install an SFC in the Cisco 12008, perform the following steps:

**Step 1** With one hand, grasp the new SFC by its card carrier's faceplate; support the weight of the card by placing your other hand underneath the card carrier.

**Step 2** Position the card carrier horizontally and insert it into the vacant slot, sliding it under the guide rails (see Figure 2), until the tabs on the bottom of the card carrier clear the line on the chassis and the SFC is firmly seated in the backplane (see Figure 2).

**Figure 2 Installing an SFC**




**Step 3** Restore the air filter assembly to the switch router to fully enclose the lower card cage. Secure the assembly in place by tightening its two panel fastener screws.

This completes the procedure for removing and installing an SFC. Upon completion of this procedure, you can verify the operability of the new SFC by performing the procedure in the section "Checking the Installation of Switch Cards" on page 8 .

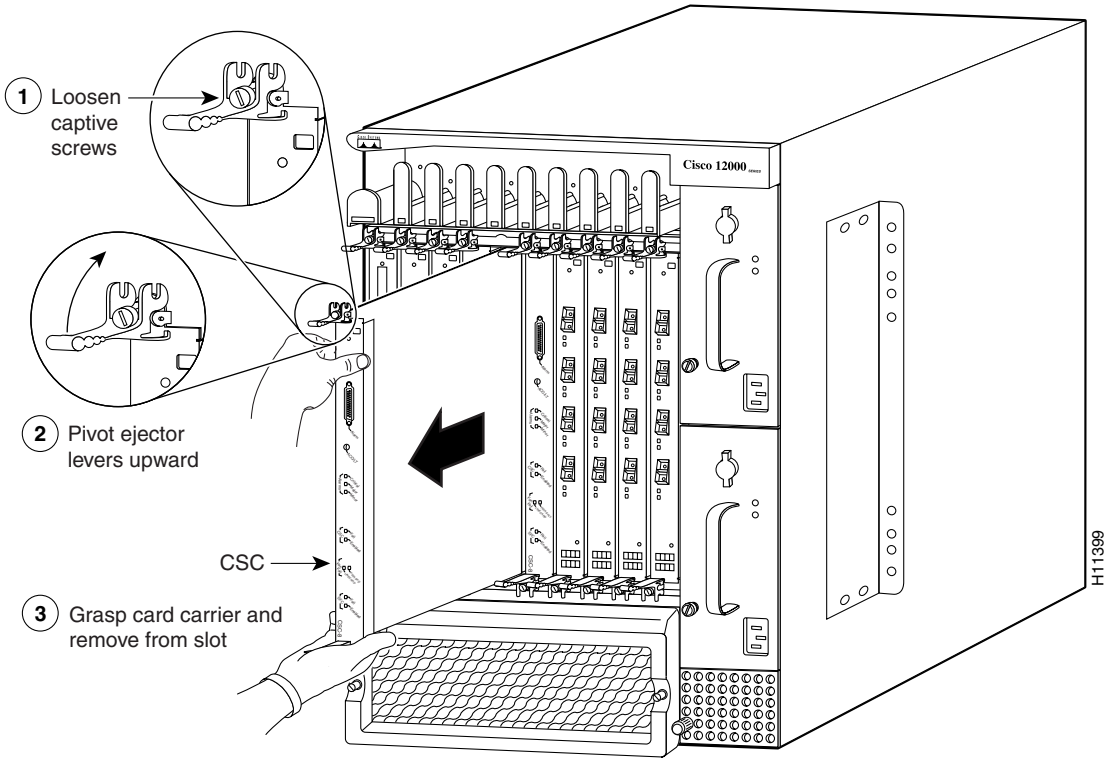
# Removing a CSC

To remove a CSC from the Cisco 12008, perform the following steps.

**Note** Before accessing any of the switch router's internal components, put on an antistatic wrist strap and make sure that it makes adequate contact with your skin. Insert the equipment end of the wrist strap (the banana jack) into the ESD socket on the lower left edge of the upper card cage.

**Step 1** Loosen the two captive installation screws beneath the card ejector levers at the top and bottom of the card (see Figure 3).

**Figure 3 Removing a CSC**




**Step 2** Grasp the ejector levers and pivot them upwards, away from the card faceplate, to unseat the card from the backplane (see Figure 3).

**Step 3** Touching only the ejector levers or the metal card carrier proper, slide the card out of the slot and store it in an antistatic bag or in an antistatic card rack (see Figure 3).

**Step 4** If you intend to return the card for repair or replacement, leave the card in its antistatic bag and prepare a return package for shipment.

**Step 5** Insert the replacement CSC or a blank filler panel (refer to the section "Installing a CSC" on page 8 or "Installing/Removing a Blank Filler Panel" on page 11 ).

# Installing a CSC

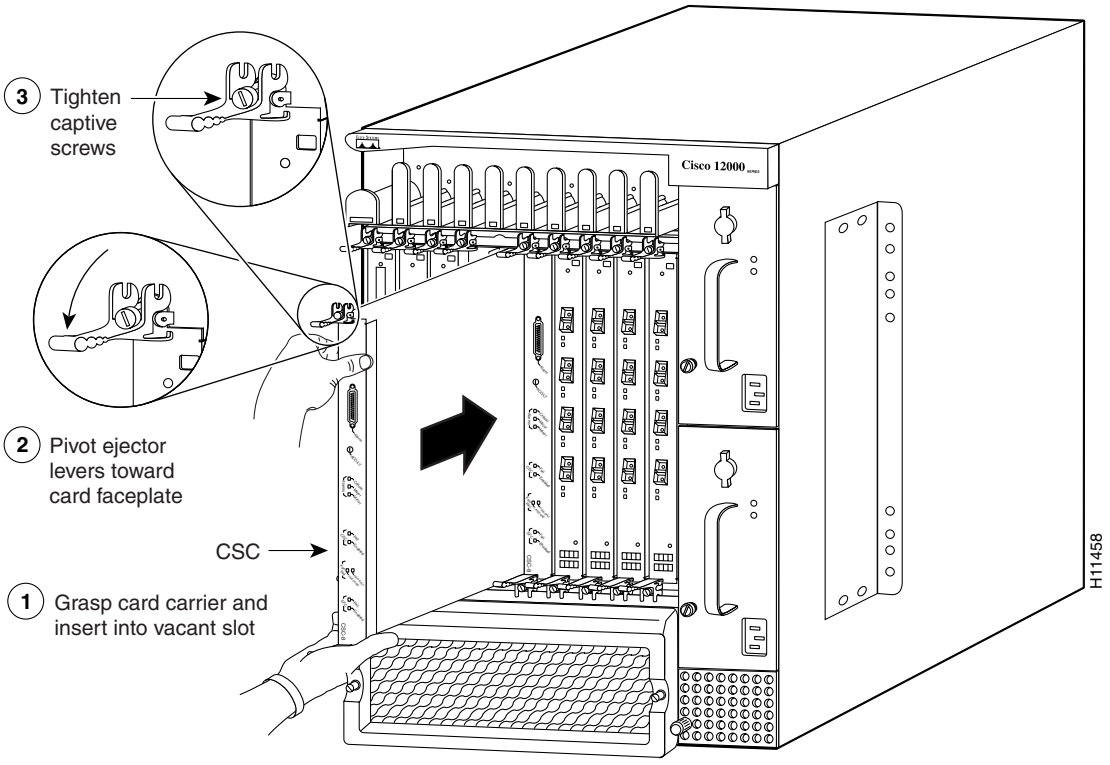
To install a CSC in the Cisco 12008, perform the following steps:

**Step 1** With one hand, grasp the new CSC by its faceplate; support the weight of the card by placing your other hand underneath the card carrier.

**Step 2** Position the card vertically and insert it into the vacant slot in the upper card cage until the card's ejector levers meet the retention lips at the top and bottom of the enclosure (see Figure 4).

**Step 3** Pivot the ejector levers toward the card faceplate to engage the retention lips at the top and bottom of the enclosure and firmly seat the card in the backplane (see Figure 4).

**Figure 4 Installing a CSC**




This completes the procedure for removing and installing a CSC. Upon completion of this procedure, you can verify the operability of the new CSC by performing the procedure in the section "Checking the Installation of Switch Cards" on page 8 .

# Checking the Installation of Switch Cards

To verify the proper operation of a newly-installed switch card, perform the following steps:

**Step 1** Observe the LEDs on the faceplate of the CSC(s), as follows:

- For a new CSC—Observe the two status LEDs pertaining to the CSC (see Figure 5). If the top (OK) LED is on (green), the new CSC is operational. In this event, the validation procedure is complete. However, if the bottom (FAIL) LED is on (amber), the new CSC is faulty (see Table 1). In this case, proceed to Step 3.

- For a new SFC—The first (primary) indication of SFC status is provided by the status LEDs for the SFCs located at the bottom of the CSC faceplate (see Figure 6). If the bottom LED is on (green), the installed SFCs are operational (see Table 1). That ends the validation procedure, except for returning the air filter assembly to its proper place (see Step 3). However, if the top LED is on (amber), one or more of the installed SFCs is faulty (see Table 2). In this case, go to Step 2.

**Figure 5 Status LEDs on a CSC**

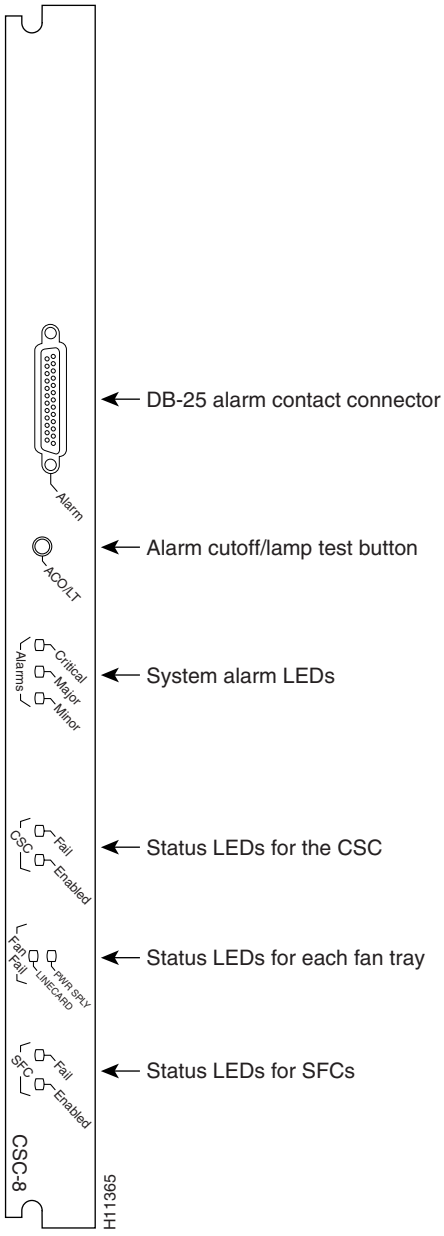


**Table 1 LEDs for CSC Status**

| Status LEDs | State | Description |
|---|---|---|
| Top LED | On (amber) | Indicates that CSC is faulty |
| Bottom LED | On (green) | Indicates that CSC is operational |

**Step 2** The secondary indication of SFC status is provided by the two LEDs on each SFC (see Figure 6). Observe each pair of LEDs on each SFC for the following indications:

- If the left LED (OK) is on (green), the associated card is operational (see Table 2).
- If the right LED (FAIL) is on (amber), the associated card is faulty (see Table 2). In this case, go to Step 3.

**Figure 6 Status LEDs on an SFC**

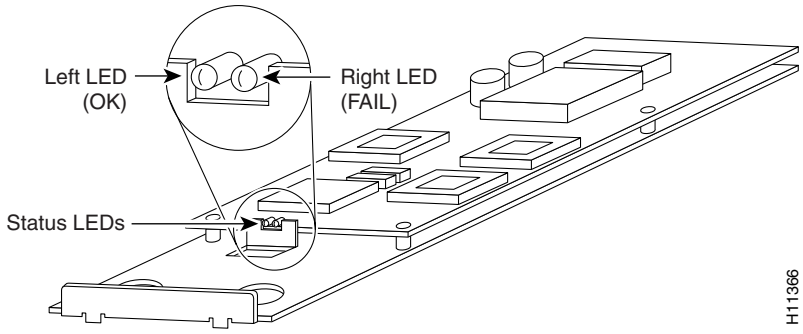



**Table 2 LEDs for SFC Status**

| Status LEDs | State | Description |
|---|---|---|
| Top LED | On (amber) | Indicates that a fault has been detected in one or more of the SFCs |
| Bottom LED | On (green) | Indicates that SFCs are installed and operating normally |
| Both LEDs | Off | Indicates that no SFCs are installed |

**Step 3** If the new switch fabric is faulty, perform the following steps, as appropriate:

- Re-seat the card in the slot and again observe its LEDs, as outlined in Step 1 and Step 2.
- If the associated LEDs for the card continue to indicate that the card is faulty, replace the card with a new one and repeat the verification procedure from the beginning. If this does not resolve the problem, ask your service representative for assistance.
- If you have installed new SFCs in the lower card cage and they pass the validation tests (as affirmed by the state of the primary and secondary LEDs noted in Step 1 and Step 2, respectively), replace the air filter assembly covering the lower card cage and secure it in place with its two captive installation screws.

In Step 2 above, since the SFCs are not visible during normal operation, you must remove the air filter assembly from the switch router to observe the status LEDs on each SFC. These LEDs are arranged side-by-side (as you view the SFCs from the front of the switch router).

Alternatively, you could issue the following command in EXEC mode to show the status of all the switch router's LEDs:

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router# show environment leds
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If the CSC indicates a fault with an SFC, you must still remove the air filter assembly from the switch router and observe the status LEDs on the SFCs proper to determine which of them was actually at fault.

## Installing/Removing a Blank Filler Panel

The Cisco 12008 must be fully enclosed to ensure that cooling air is distributed properly throughout the system. Fully enclosing the router prevents overheating of electronic components and suppresses EMI radiation from the system.

To cover any vacant slot in the upper card cage, you must install a blank filler panel (see Figure 7).

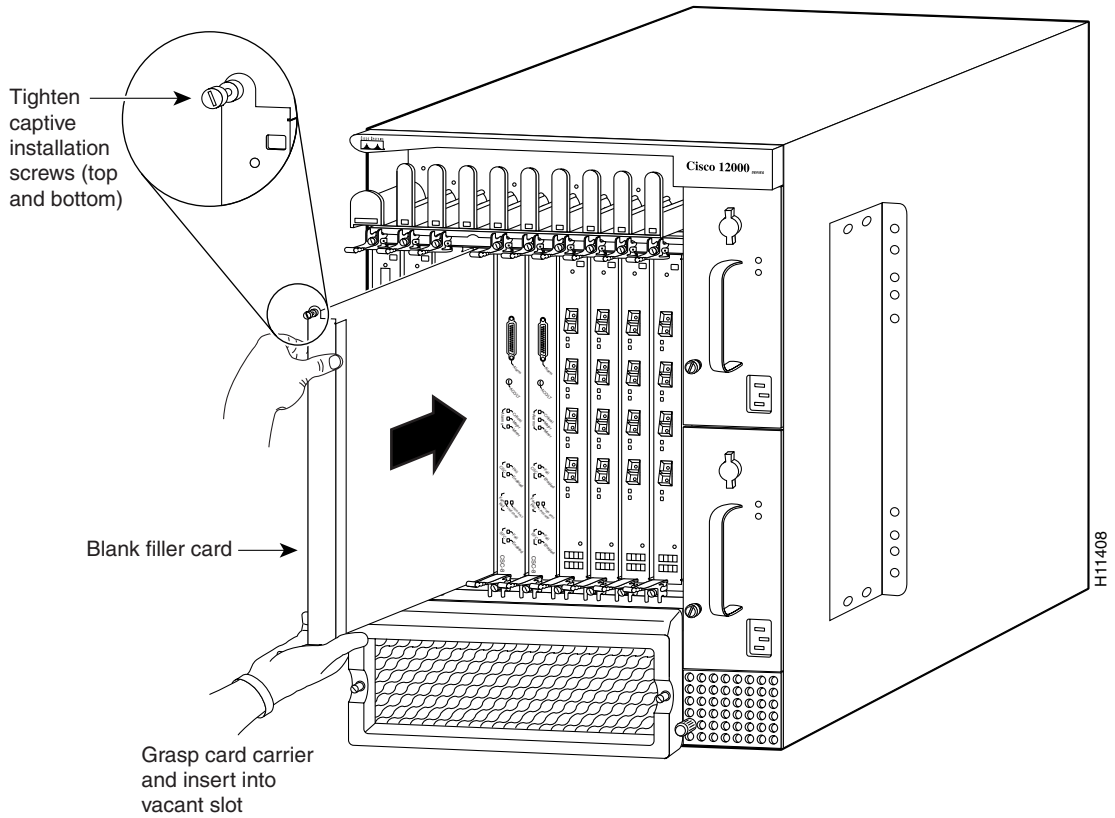
To install a blank filler panel in the upper card cage, perform the following steps:

**Step 1** Grasp the filler panel and position it vertically and insert it into the vacant slot.

**Step 2** Tighten down the two captive installation screws at the top and bottom of the filler panel, securing it firmly in place.

If it becomes necessary to remove a blank filler panel to accommodate the insertion of a new card in the upper card cage, perform the converse of the steps outlined above.

**Figure 7 Installing a Blank Filler Panel in the Upper Card Cage**



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Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

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You can access CCO in the following ways:

- WWW: http://www.cisco.com
- WWW: http://www-europe.cisco.com
- WWW: http://www-china.cisco.com
- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

**Note** If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@cisco.com.

This document is to be used in conjunction with the *Cisco 12008 Gigabit Switch Router Installation and Configuration Guide*.