Cisco Catalyst 8500 Series Edge Platforms Hardware Installation Guide

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CHAPTER 4   **Removing and Replacing FRUs** **49**

Preface

Document Revision History

The following table records the changes made to this document.

Document Objectives

This publication describes the installation of the Cisco Catalyst 8500 Series Edge Platforms and replacement or upgrade of field-replaceable units (FRUs).

Audience

This publication is primarily designed for persons responsible for installing, maintaining, and troubleshooting the Cisco Catalyst 8500 Series Edge Platforms. The users of this guide should:

- Be familiar with electronic circuitry and wiring practices.

- Have experience working as electronic or electromechanical technicians.

- Have experience in installing high-end networking equipment.

Note Certain procedures described in this guide require a certified electrician.

Conventions

Text Type	Indication
User input	Text the user should enter exactly as shown or keys a user should press appear in **this font**.
Document titles	Document titles appear in *this font*.
System output	Terminal sessions and information that the system displays appear in `this font`.
CLI commands	CLI command keywords appear in **this font**. Variables in a CLI command appear in *this font*.
[ ]	Elements in square brackets are optional.
{x | y | z}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
! #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note   Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

Tip   Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

Caution   Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

Timesaver   Means *the described action saves time*. You can save time by performing the action described in the paragraph.

Warning   IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly What's New in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation.

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.

CHAPTER 1

Overview

The Cisco Catalyst 8500 Series Edge Platforms are well suited for medium-sized and large enterprise branch offices for high WAN IPSec performance with integrated SD-WAN services.

The Cisco Catalyst 8500 Series Edge Platforms target these use cases:

- Enterprise Branch office, Managed Service Provide CPE, Internet Gateway for DIA, SASE cloud platform with SD-WAN

- Next-generation of Software Defined (SD) Branch routing platforms

The Cisco Catalyst 8500 Series Edge Platforms significantly increases services performance, router throughput, and router scale at lower costs.

This document covers only hardware installation specific details for the following models:

- C8500-12X4QC

- C8500-12X

- C8500-20X6C

For more information on the features and specifications of Cisco 8500 Series Catalyst Edge Platform, refer the Cisco 8500 Series Catalyst Edge Platform datasheet

Hardware Features

Table 1: Hardware Features for Cisco 8500 Series Catalyst Edge Platforms

Feature	C8500-12X4QC	C8500-12X	C8500-20X6C
Rack Units	One	One	Three
SSD	480 GB SSD hard drive	480 GB SSD hard drive	480 GB SSD hard drive
Management Interface RJ-45	RJ-45 console port	RJ-45 console port	RJ-45 console port
Micro-USB Console Port	Supported	Supported	Supported
Boot flash Storage	32 GB internal boot flash storage	32 GB internal boot flash storage	32 GB internal boot flash storage
USB Ports	Two USB 3.0 ports for USB flash sticks	Two USB 3.0 ports for USB flash sticks	Two USB 3.0 ports for USB flash sticks
Supported Transceivers	12x SFP+, 4x QSFP 1G SFP or 10G SFP+ can be configured with dual-rate 10GE ports as follows: **10G SFP+ on dual-rate 10GE Interface:** Auto-negotiation protocol is not supported, and automatic negotiation cannot be configured using **negotiation auto** command. **1G SFP on dual-rate 10GE Interface:** Auto-negotiation protocol is supported, and automatic negotiation can be configured using **negotiation auto** command. To disable auto negotiation, use **no negotiation auto** command.	12x SFP+ 1G SFP or 10G SFP+ can be configured with dual-rate 10GE ports as follows: **10G SFP+ on dual-rate 10GE Interface:** Auto-negotiation protocol is not supported, and automatic negotiation cannot be configured using **negotiation auto** command. **1G SFP on dual-rate 10GE Interface:** Auto-negotiation protocol is supported, and automatic negotiation can be configured using **negotiation auto** command. To disable auto negotiation, use **no negotiation auto** command.	20xSFP+, 6xQSFP+ 1G SFP or 10G SFP+ can be configured with dual-rate 10GE ports as follows: **10G SFP+ on dual-rate 10GE Interface:** Auto-negotiation protocol is not supported, and automatic negotiation cannot be configured using **negotiation auto** command. **1G SFP on dual-rate 10GE Interface:** Auto-negotiation protocol is supported, and automatic negotiation can be configured using **negotiation auto** command. To disable auto negotiation, use **no negotiation auto** command.

Feature	C8500-12X4QC	C8500-12X	C8500-20X6C
TCAM	80 MB Ternary Content-Addressable Memory (TCAM)	10 MB Ternary Content-Addressable Memory (TCAM)	320 MB Ternary Content-Addressable Memory (TCAM)
Power Supplies	AC (PWR-CH1-750WACR) DC (PWR-CH1-950WDCR)	AC (PWR-CH1-750WACR) DC (PWR-CH1-950WDCR)	AC (PWR-CH1-1100WAC) DC (PWR-CH1-950WDC)
System Memory (RAM)	16 GB default (two DIMMS) can be upgraded to 64 GB total	16 GB default (two DIMMS) can be upgraded to 64 GB total	64 GB (four 16 GB DIMMS) not upgradable.
Rack Installation	Two post and four post	Two post and four post	Four post only

Chassis Views

Cisco C8500-12X4QC Chassis Views

Figure 1: Cisco C8500-12X4QC Front View
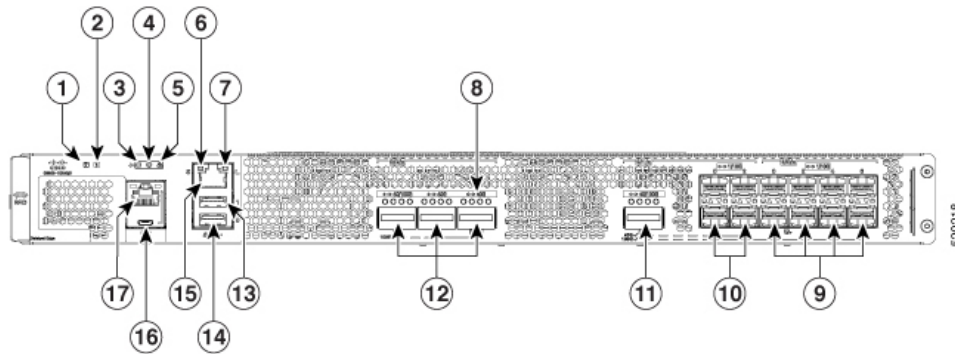
1	Power LED	11	Bay 1 : Configurable 100G or 40G
2	Status LED	12	Bay 2 : Configurable 1x100G or 3x40G
3 , 4, and 5	Alarm LED	13	USB 1
6 and 7	Management Interface LED	14	USB 0
8	Link Status LED	15	Management Interface

| 9 | Bay 0 : 8x 1/10 GE | 16 | Micro-USB Console |
| 10 | Bay 1 : 4x1/10 GE | 17 | Console RJ-45 |

Figure 2: Cisco C8500-12X4QC Rear View
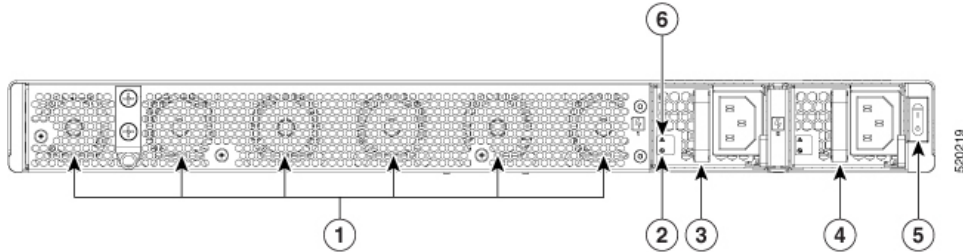
1	Fans	5	Power switch
2	Power supply AC input LED	6	Power supply failure LED
3, and 4	PEM 0, PEM 1		—

Figure 3: Cisco C8500-12X4QC Router LEDs
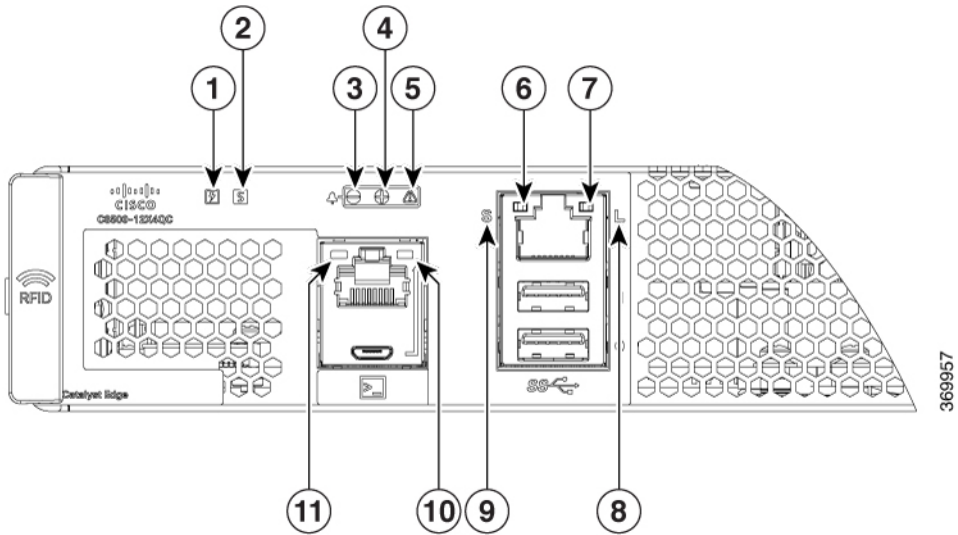
| 1 | Power LED

Off : No power to chassis.

Yellow : Power On, one power supplyhas failed or is not plugged in.

Green : All power is within specifications | 6 | Speed LED |

2	Status LED	7	Link LED
	Off : System not booted		
	Red : System Failure		
	Yellow : System booted to Rommon		
	Green : System Booted to IOS		
3	Alarm LED - Minor	8 and 9	Management Interface LEDs
			Link LED : Off no link, On Link is up.
			Speed LED : one blink 10Mbps, two blinks 100Mbps, three blinks 1000Mbps
4	Alarm LED - Major	10	USB Console Active LED
			Left LED On indicates that USB console is active
5	Alarm LED - Critical	11	Console RJ-45 Active LED
			Right LED On indicates that RJ-45 console is active

Cisco C8500-12X Chassis Views

Figure 4: Cisco C8500-12X Front View
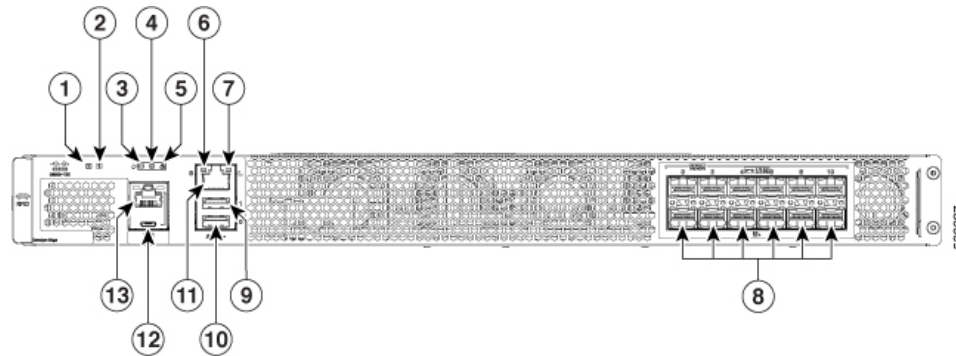
1	Power LED	9	USB 1
2	Status LED	10	USB 0
3, 4, and 5	Alarm LEDs	11	Management Interface
6, and 7	Management Interface LEDs	12	Micro-USB Console
8	Bay 0 : 12x 1/10GE SFP+ ports	13	Console RJ-45

The following figure shows the rear view of Cisco C8500-12X

Figure 5: Cisco C8500-12X Rear View
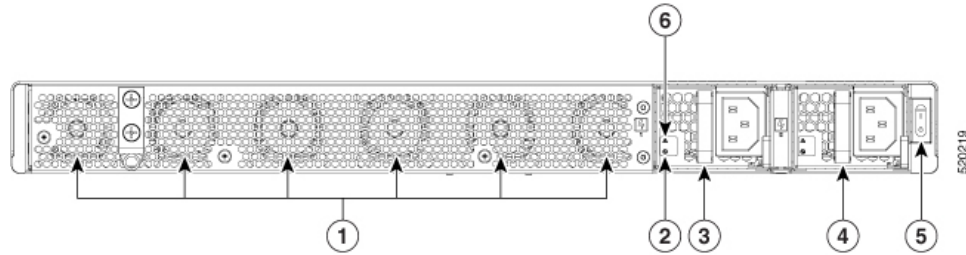
1	Fans	5	Power Switch
2	Power supply AC input LED	6	Power supply failure LED
3, and 4	PEM 0, PEM 1		—

Cisco C8500-20X6C Chassis Views

Figure 6: Cisco C8500-20X6C Chassis—Front View
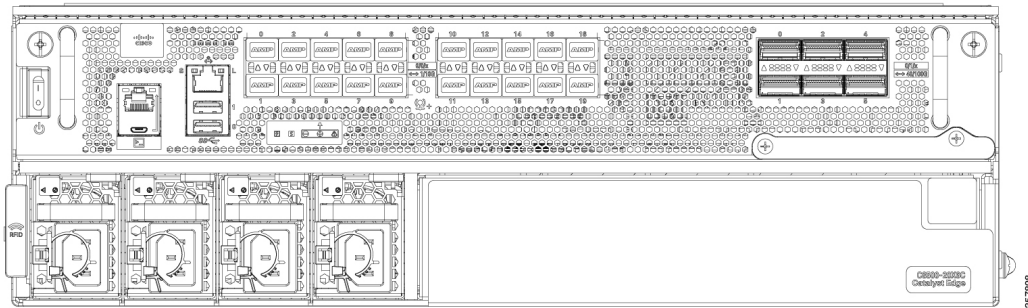
Figure 7: Cisco C8500-20X6C Front View—Bays, Ports
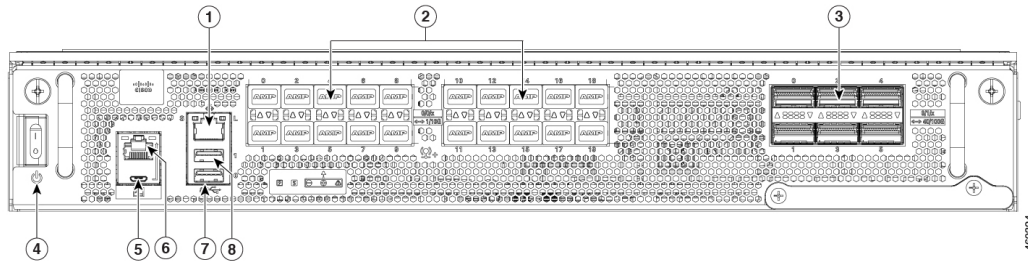
1	Management Interface RJ-45	5	Micro-USB Console
2	Bay 0	6	Console RJ-45
3	Bay 1	7	USB 0

| 4 | Power switch | 8 | USB 1 |

Figure 8: Cisco C8500-20X6C Front View—Power Supplies
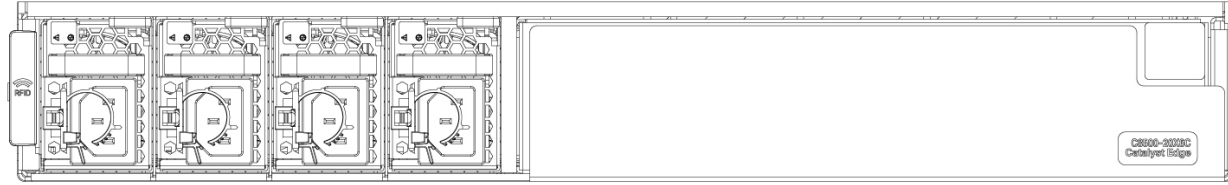
Figure 9: Cisco C8500-20X6C LEDs
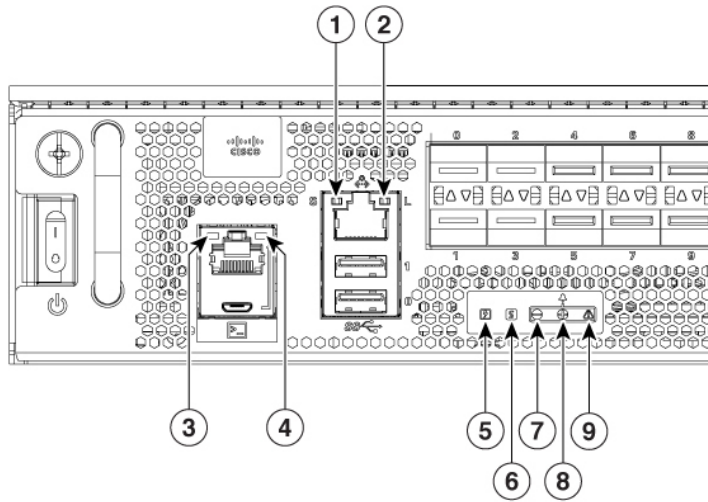
| 1	Management interface LED Flashing green : Link activity indicator Off : No Link Solid Green : Link with no activity	5	Power LED Off : No power to chassis. Yellow : Power On, one power supply has failed or is not plugged in. Green : All power is within specifications
2	Management interface LED - Link Link LED : Off - no link, Link LED : On - Link is up	6	Status LED Off : System not booted Red : System Failure Yellow : System is booted to ROMmon Green : System is booted to IOS
3	Micro-USB LED Left LED On indicates that USB console is active	7,8, and 9	Alarm LED : Minor, Major, Critical

4	Console RJ-45 LED	—
	Right LED On indicates that RJ-45 console is active	

Bay Configuration

Bay Configuration - C8500-12X4QC

The C8500-12X4QC has three bays that are configurable and supports up to 120G of bandwidth.

Figure 10: Bay Configuration - C8500-12X4QC
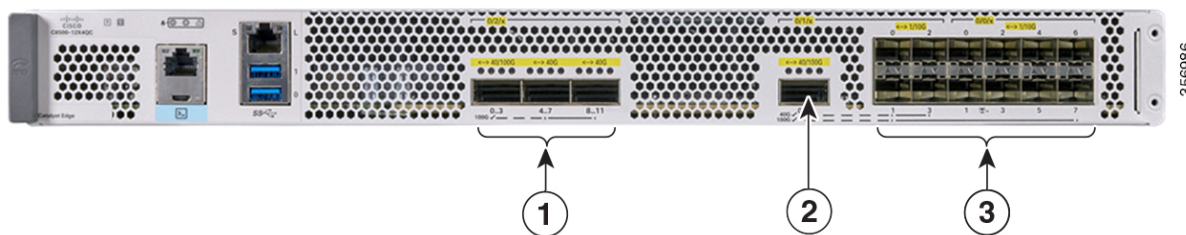
1	Bay 2 : 3XQSFP : Individually configurable as 1x 100G or 3x 40G	3	Bay 1 : 4xSFP+/1xQSFP : Individually configurable as 1x 100G or 1x 40G or breakout 4x 10/1G
2	Bay 0 : 8xSFP+ : Individually configurable as 8x 10/1G		—

Bay Configuration - C8500-12X4

The C8500-12X4 has one bay with twelve confgurable ports.

Figure 11: Bay Configuration - C8500-12X4

1	Bay 0 : 12XSFP+: Individually configurable as 12X10/1G

Bay Configuration - C8500-20X6C

The C8500-20X6C has two bays that are configurable and supports up to 400G of bandwidth.

Figure 12: Bay Configuration - C8500 - 20X6C

1	Bay 0 : 20xSFP+	2	Bay 1 : 6xQSFP+
	20 ports that can be configured as :		6 ports that can be configured as :
	• 1G		• 40G
	• 10G		• 100G
	• a mix of 1G and 10G		• a mix of 40G and 100G

AC Power Supply

Figure 13: AC Power Supply Used in the Cisco C8500-12X4QC Router
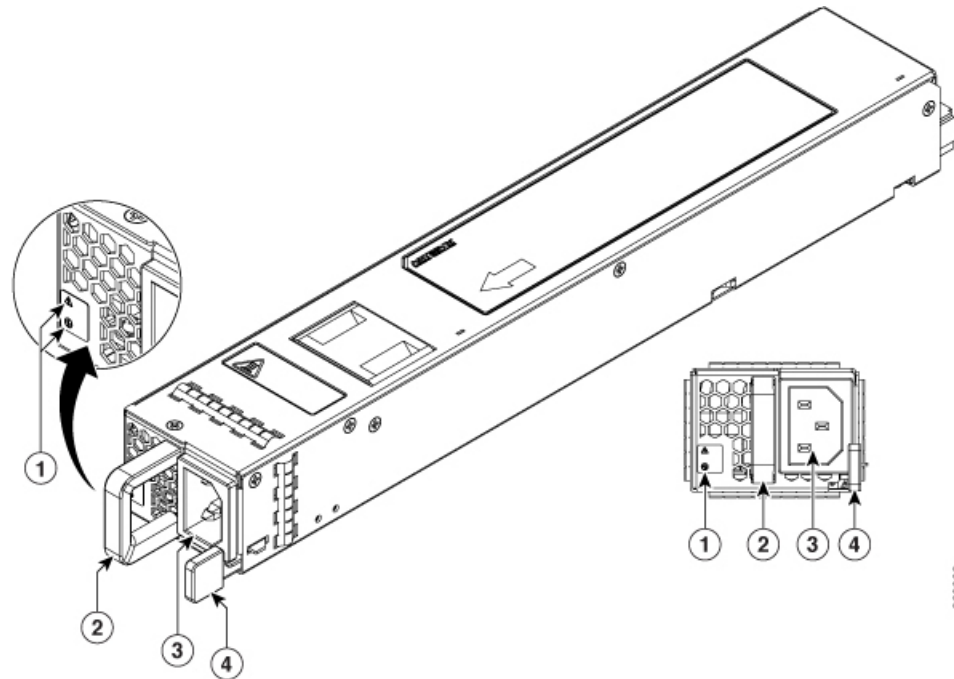
1	Fail and OK LEDs	3	AC power connector
2	Handle	4	Retaining latch

Figure 14: AC Power Supply Used in the Cisco C8500-20X6C Router
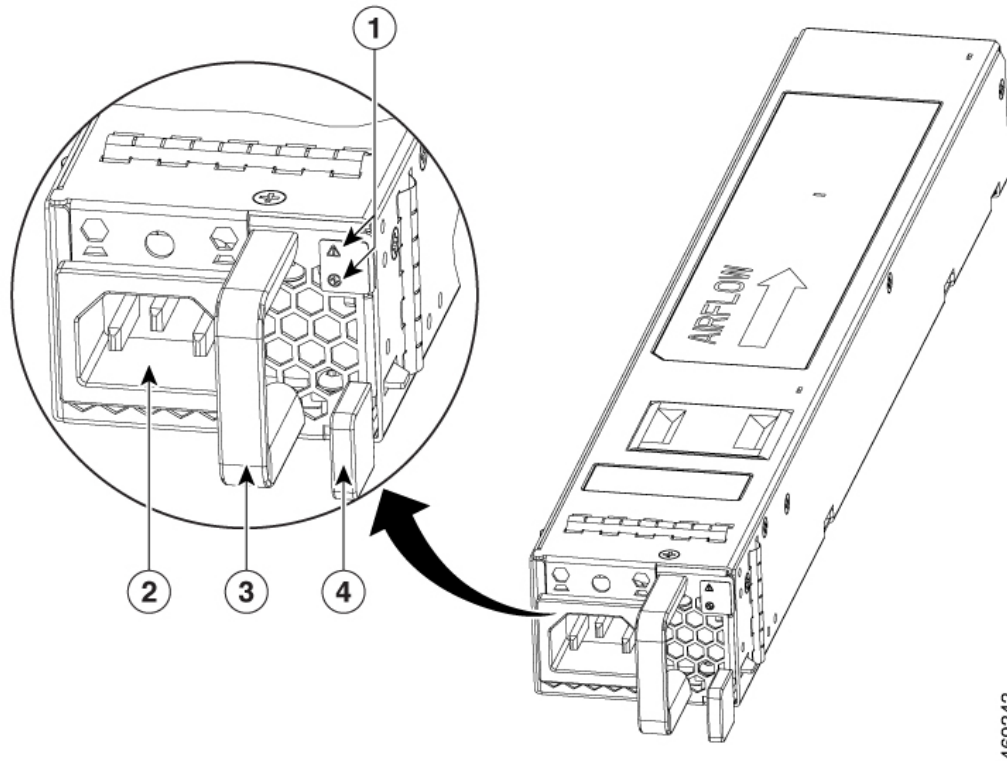
1	Fail and OK LEDs	3	Handle
2	AC power connector	4	Retaining latch

DC Power Supply

The DC (PWR-CH1-950WDCR) input connector is a two-wire connector with connection polarity from left to right (when facing the unit) of positive (+) and negative (–).

The power supply has a handle to be used for insertion and extraction. The module must be supported with one hand because of its length.

> **Note**   The airflow direction is front to back with ambient air drawn in from the venting located on the chassis front sides.

The following figure shows the DC power supply.

Figure 15: DC Power Supply
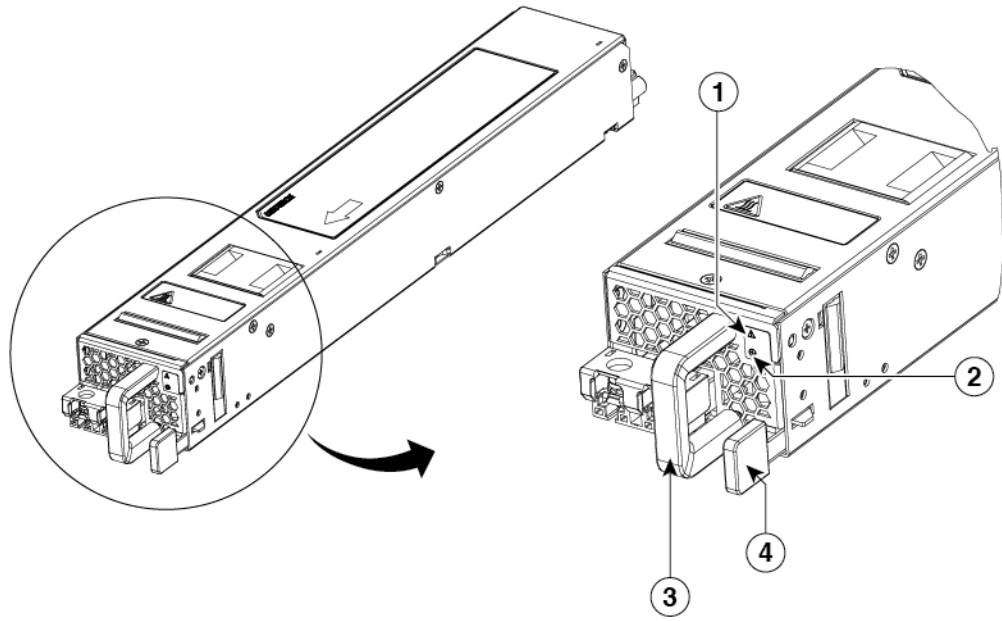
1	Fail LED	2	OK LED
3	Handle	4	Retaining latch

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1 and 2	Fail and OK LEDs	3	Handle
4	Retaining latch		—

Power Supply LED

The following table describes the power supply LED.

Table 2: AC and DC Power Supply LED

Power Supply Condition	Green (OK) LED Status	Amber (FAIL) LED Status
No AC power to all power supplies	Off	Off

Power Supply Condition	Green (OK) LED Status	Amber (FAIL) LED Status
Power Supply Failure (includes over voltage, over current, over temperature and fan failure)	Off	On
Power Supply Warning events where the power supply continues to operate (high temperature, high power and slow fan)	Off	1Hz (blinking once per second)
AC Present/3.3VSB on (PSU Off)	1Hz (blinking once per second)	Off
Power Supply On and OK	On	Off

Power Supply Fans

The fans in the power supply module are used for cooling the power supply module itself while system-level cooling is provided by fans within the chassis. The power supplies do not depend on the system-level fans for cooling. Fan failure is determined by fan-rotation sensors.

⚠

Caution   The chassis has a front-to-rear airflow. All of the power supplies and fan modules in the same chassis must use the same airflow direction or an error will occur with possible overheating and shut down of the router. If you power up the router with more than one airflow direction, you must power down the router and replace the modules with the wrong airflow direction before powering up the router.

✎

Note   The fans in the power supply modules will run as soon as the power supply is plugged in, even if the power switch is in the Standby position.

Serial Number and PID/VID Label Location

The following figure show the location of the serial number and the PID/VID label on the Cisco Catalyst 8500 Series Edge Platforms.

Figure 17: Cisco C8500-12X4QC and C8500-12X Serial Number and PID/VID Label Location
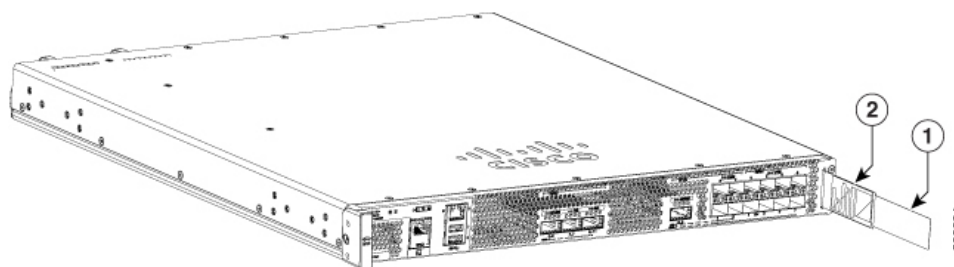
1	Label Carrier, extended from chassis	2	PID/VID Label

On C8500-20X6C, the PID/VID label is located on top of the chassis.

C H A P T E R 2

Preparing Your Site for Installation

This chapter contains important safety information you should know before working with working with the Cisco Catalyst 8500 Series Edge Platforms and guides you through the process of preparingyour site for router installation.

Prerequisites and Preparation

Before you perform the procedures in this guide, we recommend that you:

- Read the safety guidelines in the next section and review the electrical safety and ESD-prevention guidelines in this guide.

- Ensure that you have all of the necessary tools and equipment (see the "Tools and Equipment" section).

- Ensure that you have access to the *Cisco Catalyst 8500 Series Edge Platforms Software Configuration Guide* (an online document that is available for viewing or download at Cisco.com) during the installation.

- Ensure that the power and cabling requirements are in place at your installation site.

- Ensure that the equipment required to install the router is available.

- Ensure that your installation site meets the environmental conditions to maintain normal operation.

Before installing the router, you must consider power and cabling requirements that must be in place at your installation site, special equipment for installing the router, and the environmental conditions your installation site must meet to maintain normal operation.

The shipping package for the router is engineered to reduce the chances of product damage associated with routine material handling experienced during shipment:

- Router should always be transported or stored in its shipping package in the upright position.

- Keep the router in the shipping container until you have determined the installation site.

Note Inspect all items for shipping damage. If an item appears damaged, contact a Cisco customer service representative immediately.

Site Planning Checklist

Use the following checklist to perform and account for all the site-planning tasks described in this chapter:

- The site air conditioning system can compensate for the heat dissipation of the router.

- Electrical service to the site complies with the requirements.

- The electrical circuit servicing the router complies with the requirements.

- Consideration has been given to console port wiring and limitations of the cabling involved, according to TIA/EIA-232F.

- The Ethernet cabling distances are within limitations.

- The equipment rack in which you plan to install the router chassis complies with requirements. Careful consideration has be given to safety, ease of maintenance, and proper airflow in selecting the location of the rack.

Safety Guidelines

Before you begin the installation or replacement procedure, review the safety guidelines in this section to avoid injuring yourself or damaging the equipment.

Note This section contains guidelines, and do not include every potentially hazardous situation. When you install a router, always use common sense and caution.

Safety Warnings

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, might harm you. A warning symbol precedes each warning statement.

Before you install, configure, or perform maintenance on the router, review the documentation for the procedure you are about to perform, paying special attention to the safety warnings.

Note	Do not unpack the system until you are ready to install it. Keep the chassis in the shipping container to prevent accidental damage until you determine an installation site. Use the appropriate unpacking documentation included with the system.

Read the installation instructions in this document before you connect the system to its power source. Failure to read and follow these guidelines could lead to an unsuccessful installation and possibly damage the system and components.

Safety Recommendations

The following guidelines will help to ensure your own safety and protect your Cisco equipment. This list does not cover all potentially hazardous situations, so *be alert*.

- Cisco safety policy mandates that all its routers must conform to the requirements of IEC 60950, with appropriate national deviations, as a minimum. In addition, Cisco routers must also meet the requirements of any other normative documents, for example, standards, technical specifications, laws or regulations.

- Review the safety warnings listed in *Regulatory Compliance and Safety Information for the Cisco Catalyst 8500 Series Edge Platforms* (available online at Cisco.com) before installing, configuring, or maintaining the router.

- Never attempt to lift an object that might be too heavy for you to lift by yourself.

- Always turn all power supplies off and unplug all power cables before opening the chassis.

- Always unplug the power cable before installing or removing a chassis.

- Keep the chassis area clear and dust free during and after installation.

- Keep tools and chassis components away from walk areas.

- Do not wear loose clothing, jewelry (including rings and chains), or other items that could get caught in the chassis. Fasten your tie or scarf and sleeves.

- The router operates safely when it is used in accordance with its marked electrical ratings and product-usage instructions.

Compliance Requirements

This section includes Safety Compliance and Network Equipment Building Systems (NEBS) standards. The Cisco Catalyst 8500 Series Edge Platforms is in compliance with national and international standards, as described in the following table.

You must observe the following safety guidelines when working with any equipment that connects to electrical power or telephone wiring. These guidelines help you avoid injuring yourself or damaging the devices.

Table 3: Compliance Requirements

EMC/Safety Compliance and NEBS Requirements		
Specification	**Description**	
EMC/Safety	**Caution**	Shielded twisted pair T1/E1 cables must be used with any of the T1/E1 NIM interfaces in any Cisco Catalyst 8500 Series Edge Platforms. This is required for compliance with Class A emission requirements for EMC.

Cautions and Regulatory Compliance Statements for NEBS

The following table lists cautions, regulatory compliance statements, and requirements for the Network Equipment Building System (NEBS) certification from the Telcordia Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment (A Module of LSSGR, FR-64; TSGR, FR-440; and NEBSFR, FR-2063) Telcordia Technologies Generic Requirements, GR-1089-CORE.

Note   The equipment is designed to boot up in less than 30 minutes provided the neighboring devices are fully operational.

Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
Caution   The intrabuilding ports of the equipment or subassembly are only suitable for connection to intrabuilding or unexposed wiring or cabling. The intrabuilding ports of the equipment or subassembly must not be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use only as intrabuilding interfaces (Type 2 or Type 4 ports as described in GR-1089-CORE), and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring- Statement 7005
Products that have an AC power connection are intended for deployments where an external surge protective device (SPD) is used at the AC power service equipment as defined by the National Electric Code (NEC).
This product is designed for a common bonding network (CBN) installation.
This product can be installed in a network telecommunication facility or location where the NEC applies.
An electrical conducting path shall exist between the product chassis and the metal surface of the enclosure or rack in which it is mounted or to a grounding conductor. Electrical continuity shall be provided by using thread-forming type mounting screws that remove any paint or nonconductive coatings and establish a metal-to-metal contact. Any paint or other nonconductive coatings shall be removed on the surfaces between the mounting hardware and the enclosure or rack. The surfaces shall be cleaned and an antioxidant applied before installation.
The grounding architecture of this product is DC-isolated (DC-I).

DC-powered products have a nominal operating DC voltage of 48 VDC. Minimal steady-state DC operating voltage is 40.5 VDC. Reference American National Standards Institute (ANSI) T1.315, Table 1.

Standard Warning Statements

Note The English warnings in this document are preceded by a statement number. To see the translations of a warning in other languages, look up its statement number in the *Regulatory Compliance and Safety Information for the Cisco Catalyst 8500 Series Edge Platforms.*.

This section describes the warning definition and then lists core safety warnings grouped by topic.

Warning IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

General Safety Warnings

Warning Read the installation instructions before using, installing or connecting the system to the power source.

Warning Ultimate disposal of this product should be handled according to all national laws and regulations.

Warning No serviceable parts inside. To avoid risk of electric shock, do not open.

Warning To reduce risk of electric shock or fire, installation of the equipment must comply with local and national electrical codes.

Warning Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

Warning   **Statement 1005**—Circuit Breaker

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than:

AC:

  • 20 A U.S. maximum

DC:

  • 30 A U.S maximum

Warning   This product requires short-circuit (overcurrent) protection to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.

Warning   This unit might have more than one power supply connection. To reduce risk of electric shock, all connections must be removed to de-energize the unit.

Warning   This unit is intended for installation in restricted access areas. A restricted access area can be accessed by skilled, instructed or qualified personnel.

Warning   The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device.

Warning   Hazardous voltage or energy may be present on power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.

Warning   To reduce risk of fire, use copper conductors only.

Warning   This equipment must be grounded. To reduce the risk of electric shock, never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

⚠

Warning   Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.

⚠

Warning   Laser radiation is present when the system is open.

⚠

Warning   Do not stare into the laser beam.

⚠

Warning   Warning – Invisible Laser Radiation. Do not expose users of telescopic optics. Class 1/1M Laser Products.

⚠

Warning   Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.

⚠

Warning   To reduce risk of fire, explosion or leakage of flammable liquid or gas,

  • Replace the battery only with the same or equivalent type recommended by the manufacturer.

  • Do not dismantle, crush, puncture, use sharp tool to remove, short external contacts, or dispose of in fire

  • Do not use if battery is warped or swollen

  • Do not store or use battery in a temperature > C

  • Do not store or use battery in low air pressure environment <

⚠

Warning   Do not touch or bridge the metal contacts on the battery. Unintentional discharge of the batteries can cause serious burns.

⚠

Warning   To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.

⚠️

Warning   **Statement 1047**—Overheating Prevention

To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of:

104° F (40° C)

⚠️

Warning   Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.

Site Planning

This section contains site-planning information, and will help you plan for the installation of the Cisco Catalyst 8500 Series Edge Platforms.

General Precautions

Observe the following general precautions when using and working with the Cisco Catalyst 8500 Series Edge Platforms:

- Keep your system components away from radiators and heat sources and do not block cooling vents.

- Do not spill food or liquids on your system components and never operate the product in a wet environment.

- Do not push any objects into the openings of your system components. Doing so can cause fire or electric shock by shorting out interior components.

- Position system cables and power supply cable carefully. Route system cables and power supply cable and plug such that they cannot be stepped on or tripped over. Be sure that nothing else rests on your system component cables or power cable.

- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications. Always follow your local and national wiring rules.

- If you turn off your system, wait at least 30 seconds before turning it on again to avoid system component damage.

Site Cabling Guidelines

This section contains guidelines for wiring and cabling at your site. When preparing your site for network connections to the Cisco Catalyst 8500 Series Edge Platforms, consider the type of cable required for each component, and the cable limitations. Consider the distance limitations for signaling, EMI, and connector compatibility. Possible cable types are fiber, thick or thin coaxial, foil twisted-pair cabling, or unshielded twisted-pair cabling.

Also consider any additional interface equipment you need, such as transceivers, hubs, switches, modems, channel service units (CSUs), or data service units (DSUs).

Before you install the Cisco Catalyst 8500 Series Edge Platforms, have all the additional external equipment and cables at hand. For ordering information, contact a Cisco customer service representative.

The extent of your network and the distances between network interface connections depend in part on the following factors:

- Signal type

- Signal speed

- Transmission medium

The distance and rate limits referenced in the following sections are the IEEE-recommended maximum speeds and distances for signaling purposes. Use this information as guidelines when planning your network connections prior to installing the Cisco Catalyst 8500 Series Edge Platforms.

If wires exceed recommended distances, or if wires pass between buildings, give special consideration to the effect of a lightning strike in your vicinity. The electromagnetic pulse caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic devices. If you have had problems of this sort in the past, you may want to consult experts in electrical surge suppression and shielding.

Console Port Connections

The Cisco Catalyst 8500 Series Edge Platforms provides console and auxiliary ports to connect a terminal or computer for local console access.

Both ports have RJ-45 connectors, support RS-232 asynchronous data, and have distance recommendations specified in the IEEE RS-232 standard.

USB Serial Console

The USB serial console port connects directly to the USB connector of a PC using a USB Type A to 5-pin mini USB Type-B cable. The USB Console supports full speed (12Mbps) operation. The console port does not support hardware flow control.

Note

- Always use shielded USB cables with a properly terminated shield. The USB serial console interface cable must not exceed 3 meters in length.

- Only one console port can be active at a time. When a cable is plugged into the USB console port, the RJ-45 port becomes inactive. Conversely, when the USB cable is removed from the USB port, the RJ-45 port becomes active.

- 4-pin micro USB Type-B connectors are easily confused with 5-pin micro USB Type-B connectors. Only 5-pin micro USB Type-B is supported.

Interference Considerations

When wires are run for a significant distance, there is a risk that stray signals will be induced on the wires as interference. If interference signals are strong, they can cause data errors or damage to the equipment.

The following sections describe sources of interference and how to minimize its effects on the Cisco Catalyst 8500 Series Edge Platforms.

Electromagnetic Interference

All the equipment powered by AC current can propagate electrical energy that can cause electromagnetic interference (EMI) and possibly affect the operation of other equipment. The typical sources of EMI are equipment power cords and power service cables from electric utility companies.

Strong EMI can destroy the signal drivers and receivers in the Cisco Catalyst 8500 Series Edge Platforms and even create an electrical hazard by causing power surges through power lines into installed equipment. These problems are rare, but could be catastrophic.

To resolve these problems, you need specialized knowledge and equipment, which could consume substantial time and money. However, you should ensure that you have a properly grounded and shielded electrical environment, paying special attention to the need for electrical surge suppression.

The following table lists electrode magnetic compliance standards for the Cisco Catalyst 8500 Series Edge Platforms.

Table 4: EMC and Safety Standards

EMC Standards	FCC 47 CFR Part 15 Class A
	VCCI Class A
	AS/NSZ Class A
	ICES-003 Class A
	EN55022/CISPR 22 Information Technology Equipment (Emissions)
	EN55024/CISPR 24 Information Technology Equipment (Immunity)
	EN300 386 Telecommunications Network Equipment (EMC)
	EN50082-1/EN61000-6-1 Generic Immunity Standard
Safety Standards	UL 60950-1/62368-1
	CSA 60950-1/62368-1
	EN 62368-1
	IEC 62368-1
	AS/NZS 62368.1

Radio Frequency Interference

When electromagnetic fields act over a long distance, radio frequency interference (RFI) can be propagated. Building wiring can often act as an antenna, receiving the RFI signals and creating more EMI on the wiring.

If you use twisted-pair cable in your plant wiring with a good distribution of grounding conductors, the plant wiring is unlikely to emit radio interference. If you exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal.

Lightning and AC Power Fault Interference

If signal wires exceed recommended cabling distances, or if signal wires pass between buildings, you should consider the effect that a lightning strike in your vicinity might have on the Cisco Catalyst 8500 Series Edge Platforms.

The electromagnetic pulse (EMP) generated by lightning or other high-energy phenomena can couple enough energy into unshielded conductors to damage or destroy electronic equipment. If you have previously experienced such problems, you should consult with RFI/EMI experts to ensure that you have adequate electrical surge suppression and shielding of signal cables in your Cisco Catalyst 8500 Series Edge Platforms operating environment.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage occurs when electronic cards or components are improperly handled resulting in complete or intermittent failures. Static electricity can harm delicate components inside your system. To prevent static damage, discharge static electricity from your body before you touch any of your system components, such as a microprocessor. As you continue to work on your system, periodically touch an unpainted metal surface on the computer chassis.

The following are guidelines for preventing ESD damage:

- Always use an ESD-preventive wrist or ankle strap and ensure that it makes good skin contact. Before removing a card from the chassis, connect the equipment end of the strap to the ESD plug at the bottom of the chassis below the power entry modules.

- Handle line cards by faceplates and carrier edges only; avoid touching the card components or connector pins.

- When removing a module, place the removed module component-side-up on an antistatic surface or in a static-shielding bag. If the module is to be returned to the factory, immediately place it in a static-shielding bag.

- Avoid contact between the modules and clothing. The wrist strap protects the card from ESD voltages only on the body; ESD voltages on clothing can still cause damage.

- When transporting a sensitive component, place it in an antistatic container or packaging.

- Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads and workbench pads.

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

⚠

Caution Always tighten the captive installation screws on all the system components when you are installing them. These screws prevent accidental removal of the module, provide proper grounding for the system, and help ensure that the bus connectors are properly seated in the backplane.

Rack-Mounting Guidelines

This section describes guidelines on rack-mounting.

Precautions for Rack-Mounting

The following rack-mounting guidelines are provided to ensure your safety:

- Do not move large racks by yourself. Due to the height and weight of a rack, a minimum of two people are required to accomplish this task.

- Ensure that the rack is level and stable before extending a component from the rack.

- Ensure that proper airflow is provided to the components in the rack.

- Do not step or stand on any component or system when servicing other systems or components in a rack.

- When mounting the Cisco Catalyst 8500 Series Edge Platforms in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

General Rack-Selection Guidelines

The Cisco Catalyst 8500 Series Edge Platforms can be mounted in most two-post or four-post, 19-in. equipment racks that comply with the Electronics Industries Association (EIA) standard for equipment racks (EIA-310-D 19-in.). The rack must have at least two posts with mounting flanges to mount the chassis.

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Caution   When mounting a chassis in any type of rack equipment, ensure that the inlet air to the chassis does not exceed 131°F (55°C).

The distance between the center lines of the mounting holes on the two mounting posts must be 18.31 in. ± 0.06 in. (46.50 cm ± 0.15 cm). The rack-mounting hardware included with the chassis is suitable for most 19-in. (48.3-cm) equipment racks.

Consider installing the Cisco Catalyst 8500 Series Edge Platforms in a rack with the following features:

- NEBS-compliant, 19-in. (48.3-cm) wide rack.

- EIA or ETSI hole patterns in the mounting rails. Required mounting hardware is shipped with the Cisco Catalyst 8500 Series Edge Platforms. If the rack that you plan to install the system in has metric-threaded rails, you must provide your own metric-mounting hardware.

- Perforated top and open bottom for ventilation to prevent overheating.

- Leveling feet for stability.

Note The Cisco Catalyst 8500 Series Edge Platforms should *not* be installed in an enclosed rack because the chassis requires an unobstructed flow of cooling air to maintain acceptable operating temperatures for its internal components. Installing the router in any type of enclosed rack—*even with the front and back doors removed*—could disrupt the air flow, trap heat next to the chassis, and cause an overtemperature condition inside the router. If you use an enclosed rack, make certain that there are air vents on all sides of the rack and there is proper ventilation.

Guidelines for 23-in. (Telco) Racks

If needed, you can also install the Cisco Catalyst 8500 Series Edge Platforms in 23-in. (Telco) racks. For information on the adapters needed for 23 in. racks, contact the Newton Instrument Company:

http://www.enewton.com

111 East A Street, Butner NC, USA, 27509

919 575-6426

Equipment Rack Guidelines

The placement of racks can affect personnel safety, system maintenance, and the system's ability to operate within the environmental characteristics described in Cisco Catalyst 8500 Series Edge Platforms. Choose a proper location for the Cisco Catalyst 8500 Series Edge Platforms by following the guidelines below.

Locating for Safety

If the Cisco Catalyst 8500 Series Edge Platforms is the heaviest or the only piece of equipment in the rack, consider installing it at or near the bottom to ensure that the rack's center of gravity is as low as possible.

For additional information about the proper placement of electronic equipment, see the document *GR-63-CORE, Network Equipment Building System (NEBS) Requirements: Physical Protection*.

Locating for Easy Maintenance

Keep at least 3 feet of clear space in front of and behind the rack. This space ensures that you can remove the Cisco Catalyst 8500 Series Edge Platforms components and perform routine maintenance and upgrades easily.

Avoid installing the Cisco Catalyst 8500 Series Edge Platforms in a congested rack and consider how the routing of cables from other pieces of equipment in the same rack might affect access to the routers cards.

The front and top of the chassis must remain unobstructed to ensure adequate airflow and prevent overheating inside the chassis.

Allow the following clearances for normal system maintenance:

- At the top of the chassis—At least 3 in. (7.6 cm)

- In front of the chassis—3 to 4 ft (91.44 cm to 121.92 cm)

To avoid problems during installation and ongoing operation, follow these general precautions when you plan the equipment locations and connections:

- Use the **show environment all** and the **show facility-alarm status** commands regularly to check the internal system status. The environmental monitor continually checks the interior chassis environment;

it provides warnings for high temperature and creates reports on any occurrences. If warning messages are displayed, take immediate action to identify the cause and correct the problem.

• Keep the Cisco Catalyst 8500 Series Edge Platforms off the floor and out of the areas that collect dust.

• Follow ESD-prevention procedures to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.

Locating for Proper Airflow

Ensure that the location of the Cisco Catalyst 8500 Series Edge Platforms have enough airflow to keep the system operating within the environmental characteristics, and the air temperature is sufficient to compensate for the heat dissipated by the system.

Avoid locating the Cisco Catalyst 8500 Series Edge Platforms in a location in which the chassis air intake vents could draw in the exhaust air from adjacent equipment. Consider how the air flows through the router. The airflow direction is front to back with ambient air drawn in from the venting located on the chassis' front sides.

Electrical Safety

All the system components are hot-swappable. They are designed to be removed and replaced while the system is operating, without presenting an electrical hazard or damage to the system.

Follow these basic guidelines when you are working with any electrical equipment:

• Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.

• Disconnect all power and external cables before installing or removing a chassis.

• Do not work alone when potentially hazardous conditions exist.

• Never assume that power has been disconnected from a circuit; always check.

• Do not perform any action that creates a potential hazard to people or makes the equipment unsafe. Never install equipment that appears damaged.

• Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

In addition, use the following guidelines when working with any equipment that is disconnected from a power source, but is still connected to telephone wiring or other network cabling:

• Never install telephone wiring during a lightning storm.

• Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

• Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

• Use caution when installing or modifying telephone lines.

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Warning   **Statement 1001**—Work During Lightning Activity

Do not work on the system or connect or disconnect cables during periods of lightning activity.

Chassis-Lifting Guidelines

The chassis is not intended to be moved frequently. Before you install the system, ensure that your site is properly prepared so that you can avoid having to move the chassis later to accommodate power sources and network connections.

Each time you lift the chassis or any heavy object, follow these guidelines:

- Ensure that your footing is solid, and balance the weight of the chassis between your feet.

- Lift the chassis slowly; never move suddenly or twist your body as you lift.

- Keep your back straight and lift with your legs, not your back. If you must bend down to lift the chassis, bend at the knees, not at the waist, to reduce the strain on your back muscles.

- Do not remove installed components from the chassis.

- Always disconnect all external cables before lifting or moving the chassis.

Tools and Equipment

The following tools and equipment are recommended as the minimum necessary equipment to install the Cisco Catalyst 8500 Series Edge Platforms. You may need additional tools and equipment to install associated equipment and cables. You may also require test equipment to check electronic and optical signal levels, power levels, and communications links.

- Phillips hand screwdriver

- 3.5-mm flat-blade screwdriver

- Tape measure (optional)

- Level (optional)

- Power drill

- 8-gauge wire

- Rack-mount brackets

- Cable-management brackets

Unpacking and Verifying Shipping Contents

When you receive your chassis, perform the following steps and use the shipping contents checklist in the following section.

Procedure

Step 1   Inspect the box for any shipping damage. (If there is damage, contact your Cisco service representative).

Step 2   Unpack the Cisco Catalyst 8500 Series Edge Platforms.

Step 3   Perform a visual inspection of the chassis.

Step 4   After you have unpacked the system, verify that you have received all of the required components, including all the accessory items. Using the packing list as a guide, verify that you have received all the equipment listed in your order, and ensure that the configuration matches the packing list.

Checking the Shipping Container Contents

Use the components list shown in the following table to check the contents of the Cisco Catalyst 8500 Series Edge Platforms shipping container. Do not discard the shipping container. You need the container if you move or have to ship the Cisco Catalyst 8500 Series Edge Platforms in the future.

Table 5: Cisco Catalyst 8500 Series Edge Platforms Shipping Container Contents

Component	Description
Chassis	Cisco Catalyst 8500 Series Edge Platforms are configured with dual AC or dual DC power supplies.
Accessories Kit (C8500-ACCKIT-19)	Front chassis rack-mount brackets that you will attach to the chassis with their respective screws.
	Two sets of screws, one each for: • Two front rack-mount brackets (6 screws for each bracket) • Two cable-management brackets (1 mounting screw for each Cisco Catalyst 8500 Series Edge Platforms bracket) • Ground Lug kit with 2 screws
	1 RJ-45 to RJ-45 crossover cable
Accessories Kit (C8500-ACCKIT-23)	Two sets of screws, one each for: • Two front rack-mount brackets (6 screws for each bracket) • Two cable-management brackets (1 mounting screw for each Cisco Catalyst 8500 Series Edge Platforms brackets) • Ground Lug kit with 2 screws

Component	Description
Accessories Kit (C8500-4PT-KIT)	Two sets of screws, one each for: • Two front rack-mount brackets (6 screws for each bracket) • Two rear mount long snap to fit brackets (6 screws for each bracket) • Two rear rack slide rack brackets
Documentation	Pointer Doc
Optional Equipment	Power cord if an AC power supply was shipped. There are no power cords for the DC power supply units.

C H A P T E R   3

Installing the Router

This chapter provides procedures for installing the Cisco Catalyst 8500 Series Edge Platform on an equipment shelf, tabletop, or in an equipment rack.

Installation Instructions

Warning   IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Note   IMPORTANT SAFETY INSTRUCTIONS

Invisible laser radiation may be emitted from the fiber cable or connector. Do not view with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.

Note IMPORTANT SAFETY INSTRUCTIONS

Pluggable optical modules comply with IEC 60825-1 Ed. 3 and 21 CFR 1040.10 and 1040.11 with or without exception for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice No. 56, dated May 8, 2019.

Warning Read the installation instructions before using, installing or connecting the system to the power source.

Note Proceed with the installation if you have already unpacked your chassis and read all the site requirements for your new equipment.

Guidelines for Installation

The chassis should already be in the area where you want to install it. If you have not determined where to install your chassis,

- C8500-12X4QC and C8500-12X requires at least 3 inches (7.62 cm) and C8500-20X6C requires at least 5.25 inches (13.335 or 13.34 cm) of clearance at the inlet and exhaust vents (the front and rear sides of the chassis) for installing on a tabletop. The Cisco Catalyst 8500 Series Edge Platforms requires a minimum of 1.75 inches or 4.45 cm rack units of vertical rack space. Measure the proposed rack location before mounting the chassis in the rack.

- The chassis should be installed off the floor. Dust that accumulates on the floor is drawn into the interior of the router by the cooling fans. Excessive dust inside the router can cause overtemperature conditions and component failures.

- There must be approximately 19 inches (48.3 cm) of clearance at the front and rear of both the C8500-12X4QC and C8500-12X chassis and 19 inches (48.3 cm) of clearance at the front, 12 inches at the rear for C8500-20X6C chassis to install and replace FRUs, or to access network cables and equipment.

- Maintain a minimum clearance of 3 inches on the front and back sides of the chassis for the cooling air inlet and exhaust ports, respectively. Avoid placing the chassis in an overly congested rack or directly next to another equipment rack; the heated exhaust air from other equipment can enter the inlet air vents and cause an overtemperature condition inside the router.

- The chassis needs adequate ventilation. Do not install it in an enclosed cabinet where ventilation is inadequate.

- Keep the cable-management bracket ready if you plan to install it on the front of the chassis.

- Ensure that an adequate chassis ground (earth) connection exists for your router chassis (see the "Attaching a Chassis Ground Connection" section).

Installing the Router on a Standalone Equipment Shelf

Procedure

Step 1   Remove any debris and dust from the equipment shelf or platform, as well as the surrounding area.

Step 2   Lift the chassis into position on the equipment shelf.

> **Note**   Step 3 through Step 9 are optional if you are installing the Cisco Catalyst 8500 Series Edge Platforms on a rack shelf. The chassis rack-mount brackets must be installed prior to installing the cable-management brackets.

Step 3   Attach the front rack-mount brackets. Locate the threaded holes in the front sides of the chassis (first holes beyond the vent holes) and use the package of black screws that shipped with the chassis.

Step 4   Align the front rack-mount bracket to one side of the chassis.

Step 5   Insert and tighten the screws on one side.

Step 6   Repeat Step 3 through Step 5 on the other side of the chassis. Use all the screws to secure the rack-mount brackets to the chassis.

Step 7   Gather the two cable-management brackets and screws shipped with your chassis.

Step 8   Screw a cable-management bracket to each side of the rack-mount brackets that are attached to the chassis. Use two screws for each cable-management bracket. Use a screw from the package of four screws.

> **Note**   Ensure that the cable-management U feature device has the open end pointing outwards when you attach it to the chassis.

Step 9   Check that all the screws are securely tightened.

Guidelines for Rack Installation

The Cisco Catalyst 8500 Series Edge Platforms can be installed in the following rack types:

- Two-post rack, either 19 inch or 23 inch. Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26 cm). Airflow through the chassis is from front to back.

- Four-post, 19-inch equipment rack. Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26 cm). Airflow through the chassis is from front to back.

C8500-12X4QC and C8500-12X can be installed with both front or rear rack-mount brackets and C8500-20X6C must be installed with both front and rear rack-mount brackets.

When planning your rack installation, consider the following guidelines:

- The Cisco Catalyst 8500 Series Edge Platforms requires a minimum of 1.75 inches or 4.45 cm rack units of vertical rack space. The Cisco Catalyst 8500 Series Edge Platforms requires a minimum of 3.5 inches or 8.9 cm rack units of vertical rack space. Measure the proposed rack location before mounting the chassis in the rack.

- Before using a particular rack, check for obstructions (such as a power strip) that could impair rack-mount installation. If a power strip does impair a rack-mount installation, remove the power strip before installing the chassis, and then replace it after the chassis is installed.

- Allow sufficient clearance around the rack for maintenance. If the rack is mobile, you can push it back near a wall or cabinet for normal operation and pull it out for maintenance (installing or moving cards, connecting cables, or replacing or upgrading components). Otherwise, allow 19 inches (48.3 cm) of clearance to remove field-replaceable units.

- Maintain a minimum clearance of 3 inches on the front and back sides of the chassis for the cooling air inlet and exhaust ports, respectively. Avoid placing the chassis in an overly congested rack or directly next to another equipment rack; the heated exhaust air from other equipment can enter the inlet air vents and cause an overtemperature condition inside the router.

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Caution   To prevent chassis overheating, never install a Cisco Catalyst 8500 Series Edge Platforms in an enclosed space that is not properly ventilated or air conditioned.

⚠️

Caution   The recommended torque for rack mount bracket screws is 8 in-lbs.

- Always install heavier equipment in the lower half of a rack to maintain a low center of gravity to prevent the rack from falling over.

- Install and use the cable-management brackets included with the Cisco Catalyst 8500 Series Edge Platforms to keep cables organized and out of the way of the cards and processors. Ensure that cables from other equipment already installed in the rack do not impair access to the cards or require you to disconnect cables unnecessarily to perform equipment maintenance or upgrades.

- Provide an adequate chassis ground (earth) connection for your router chassis.

Verifying Rack Dimensions

Before you install the chassis, measure the space between the vertical mounting flanges (rails) on your equipment rack to verify that the rack conforms to the measurements shown in the following figure.

Figure 18: Verifying Equipment Rack Dimensions
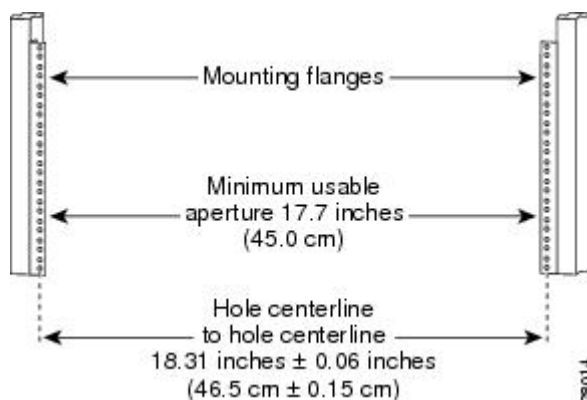
Procedure

Step 1   Mark and measure the distance between two holes on the left and right mounting rails.

The distance should measure 18.31 inches ± 0.06 inches (46.5 cm ± 0.15 cm).

Note   Measure for pairs of holes near the bottom, middle, and top of the equipment rack to ensure that the rack posts are parallel.

Step 2   Measure the space between the inner edges of the left front and right front mounting flanges on the equipment rack.

The space must be at least 17.7 inches (45 cm) to accommodate the chassis that is 17.25 inches (43.8 cm) wide and fits between the mounting posts on the rack.

Attaching the Front Rack-Mount Brackets

Before you begin

Before installing the chassis in the rack, you must install the rack-mount brackets on each side of the chassis.

Determine where in the rack you want the chassis to be mounted. If you are mounting more than one chassis in the rack, then start from the bottom up or the center of the rack. The following figure shows the brackets attached to the chassis. Depending on the bracket holes you use, the chassis may protrude in the rack.

Note   The cable-management brackets are attached to the chassis after you install the chassis rack-mount brackets on the chassis and mount the chassis in the rack.

Procedure

Step 1   Locate the threaded holes on the side of the chassis. Ensure that you hold the front rack-mount bracket with the ear and holes facing outward and towards the front of the chassis.

The following figures show where to attach the front rack-mount brackets to the Cisco Catalyst 8500 Series Edge Platforms.

Figure 19: Attaching the Front Rack-Mount Brackets to the Cisco Catalyst 8500 Series Edge Platform
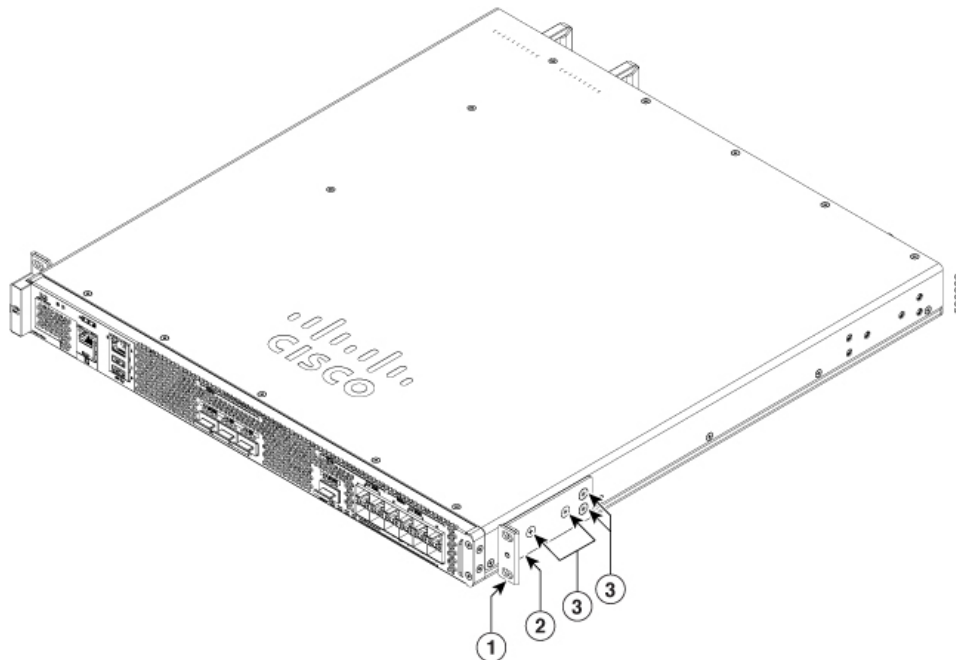
Step 2   Position the front rack-mount bracket top hole with the chassis, first top hole behind the side vent holes.

Step 3   Insert and tighten the black screws on one side.

Step 4   Repeat Step 1 through Step 3 on the other side of the chassis. Use black screws to secure the rack-mount brackets to the chassis.

Attaching the Rear Rack-Mount Brackets

Before you begin

Note   This procedure is not required if you are installing the chassis in a two-post rack.

Before installing the chassis in a four-post rack, you must install the rear rack-mount brackets on each side of the chassis.

Determine where in the rack you want the chassis to be mounted. If you are mounting more than one chassis in the rack, then start from the bottom up or the center of the rack. The following figure shows the brackets attached to the chassis.

Procedure

Step 1 Locate the threaded holes on the side of the chassis. Ensure that you hold the rear rack-mount bracket with the ear and holes facing outward and towards the rear of the chassis.

The following figures show where to attach the rear rack-mount brackets to the Cisco Catalyst 8500 Series Edge Platforms.

Figure 20: Attaching the Rear Rack-Mount Brackets to the Cisco Catalyst 8500 Series Edge Platforms
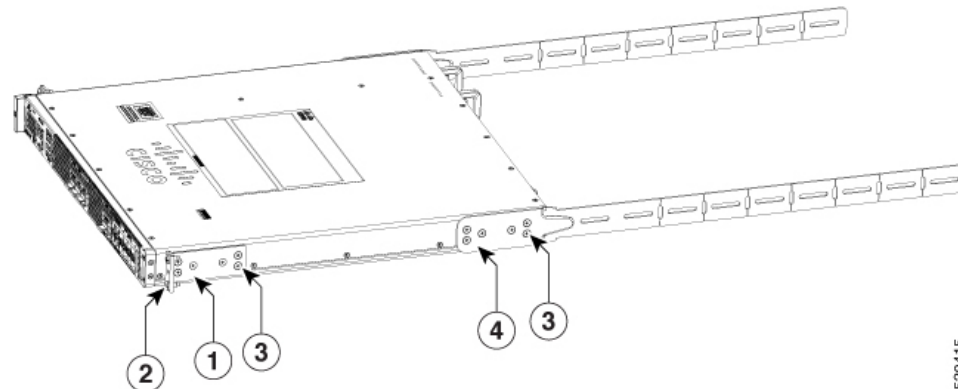
Step 2 Position the rear rack-mount bracket with the chassis.

Step 3 Insert the black screws on one side. Do not fully tighten the screws.

The rear bracket holes are slotted to allow for adjustment. Do not fully tighten the screws until the chassis is installed in the four-post rack.

Step 4 Repeat Step 1 through Step 3 on the other side of the chassis. Use black screws to secure the rack-mount brackets to the chassis.

Mounting the Router in the Rack

After installing the rack-mount brackets on the chassis, mount the chassis by securing the rack-mount brackets to two posts or mounting strips in the rack using the screws provided. Because the rack-mount brackets support the weight of the entire chassis, ensure that you use all the screws to fasten the two rack-mount brackets to the rack posts.

Two-Post Rack Installation

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Warning   To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.

- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

The Cisco C8500 Series Catalyst Edge Router can be installed on a two-post rack, either 19 inch or 23 inch. We recommend that you allow at least 1 or 2 inches (2.54 or 5.08 cm) of vertical clearance between the router and any equipment directly above and below it.

Procedure

Step 1   On the chassis, ensure that all the screw fasteners on the installed components are securely tightened.

Step 2   Make sure that your path to the rack is unobstructed. If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

Step 3   (Optional) Install a shelf in the rack to support the Cisco Catalyst 8500 Series Edge Platforms. If you use a shelf, it helps support the chassis while you secure it to the rack.

> **Note**   If you are using a shelf, place the chassis on the shelf and slightly raise the front of the chassis to align the mounting bracket holes with the rack post holes while allowing the bottom of the chassis to rest on the shelf.

Step 4   With two people, lift the chassis into position between the rack posts.

Step 5   Align the mounting bracket holes with the rack post holes and attach the chassis to the rack.

Step 6   Position the chassis until the rack-mounting flanges are flush against the mounting rails on the rack.

> **Tip**   To allow space to attach the cable-management brackets to the chassis in the rack easily, use the rack-mount bracket ear holes mentioned in Steps 7 and 8.

Step 7   Hold the chassis in position against the mounting rails in the equipment rack and follow these steps:

a) Insert the bottom screw into the second hole up from the bottom of the rack-mount ear and use a hand-held screwdriver to tighten the screw to the rack rail.

> **Tip**   To make installation easier, insert one screw at the bottom of the chassis and the next screw at the top of the chassis diagonally from the first screw.

b) Insert the top screw into the second hole from the top of the rack-mount ear diagonally from the bottom screw and tighten the screw to the rack rail.

c) Insert the rest of the screws to secure the chassis to the rack equipment.

Step 8   Tighten all the screws on each side to secure the chassis to the equipment rack.

The following figures show the Cisco Catalyst 8500 Series Edge Platform on a two-post equipment rack.

Figure 21: Cisco C8500 Series Catalyst Edge Router Installed on a Two-Post Equipment
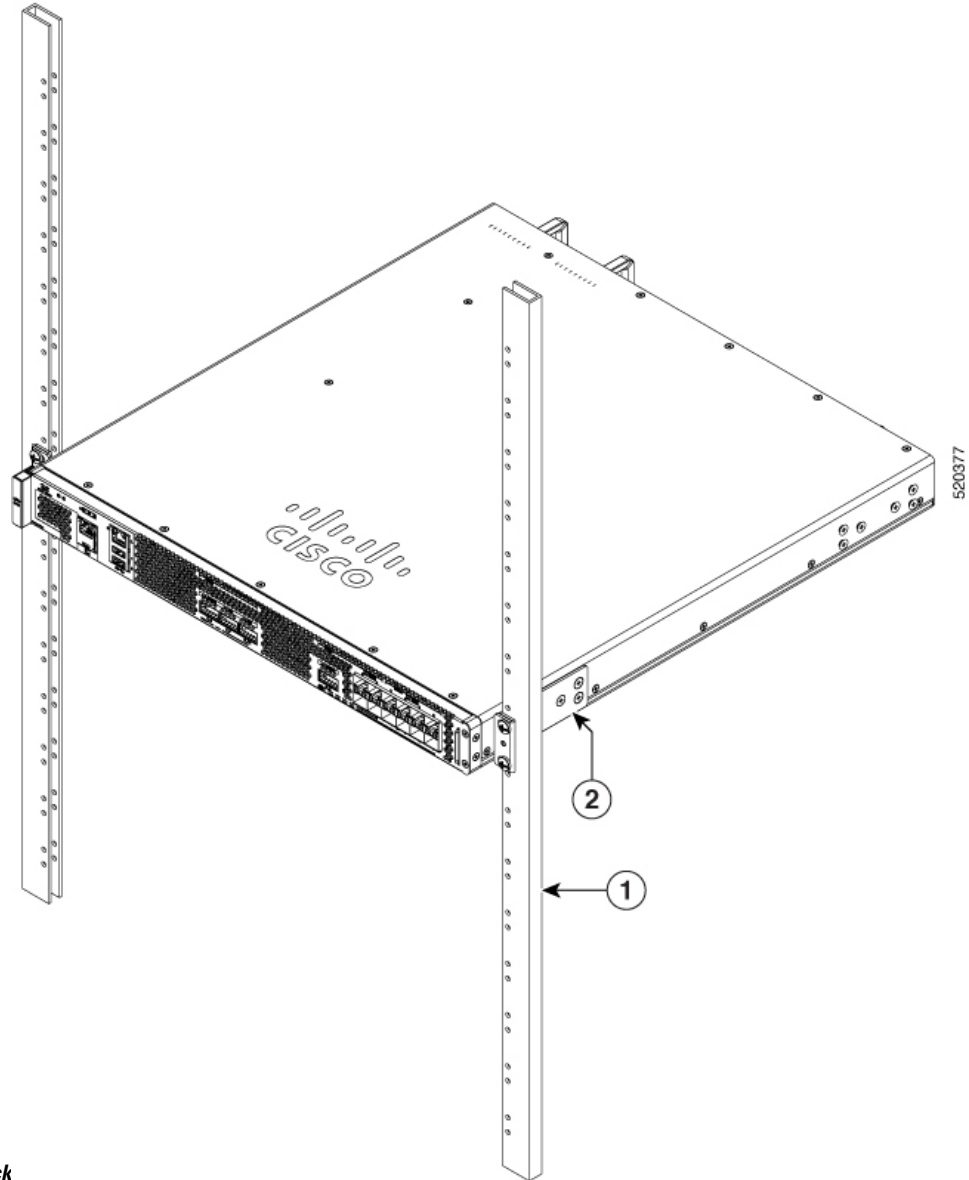
Rack

1	Rack equipment rail	2	Rack mount bracket ear and screws

Four-Post Rack Installation

Procedure

Step 1 (Optional) Install a shelf in the rack to support C8500-12X4QC, C8500-12X and C8500-20X6C. If you use a shelf, it helps support the chassis while you secure it to the rack.

Note If you are using a shelf, place the chassis on the shelf and slightly raise the front of the chassis to align the mounting bracket holes with the rack post holes while allowing the bottom of the chassis to rest on the shelf.

Step 2 With two people, lift the chassis into position between the rack posts.

Step 3 Position the chassis until the rack-mounting flanges are flush against the mounting rails on the rack.

Note Use the second hole up from the bottom of the rack-mount bracket and the second hole down from the top of the rack-mount bracket. This will make it easier to attach the cable-management bracket to the chassis in the equipment rack.

Step 4 Hold the chassis in position against the mounting rails while the second person finger-tightens a screw to the rack rails on each side of the chassis.

Step 5 Finger-tighten screws to the rack rails on each side of the chassis.

Step 6 Tighten all the screws on each side to secure the chassis to the equipment rack.

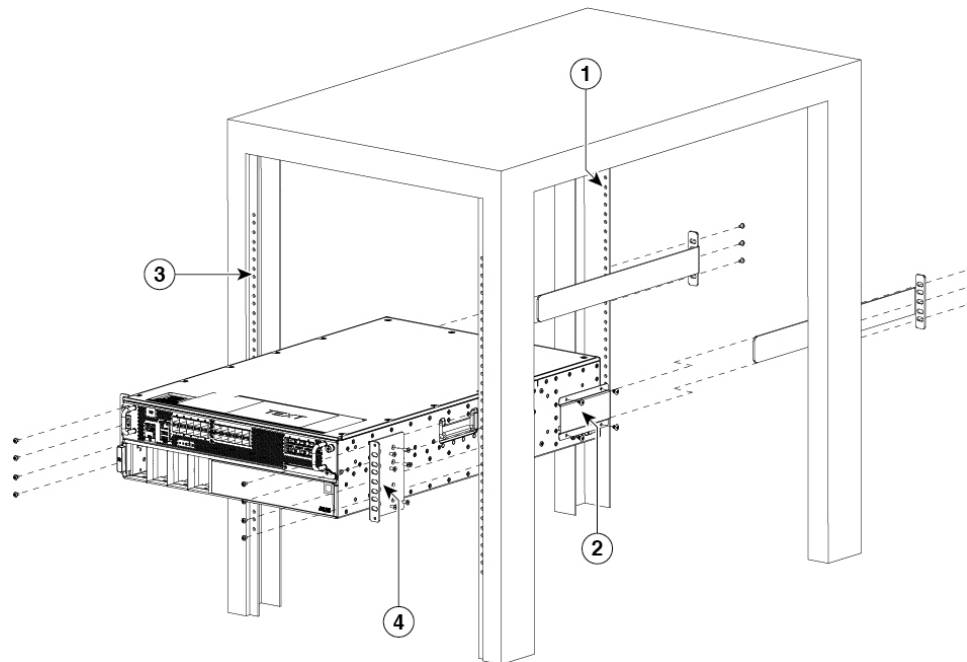*Figure 22: C8500-12X4QC and C8500-12X in a Four-Post Rack—Front and Rear*
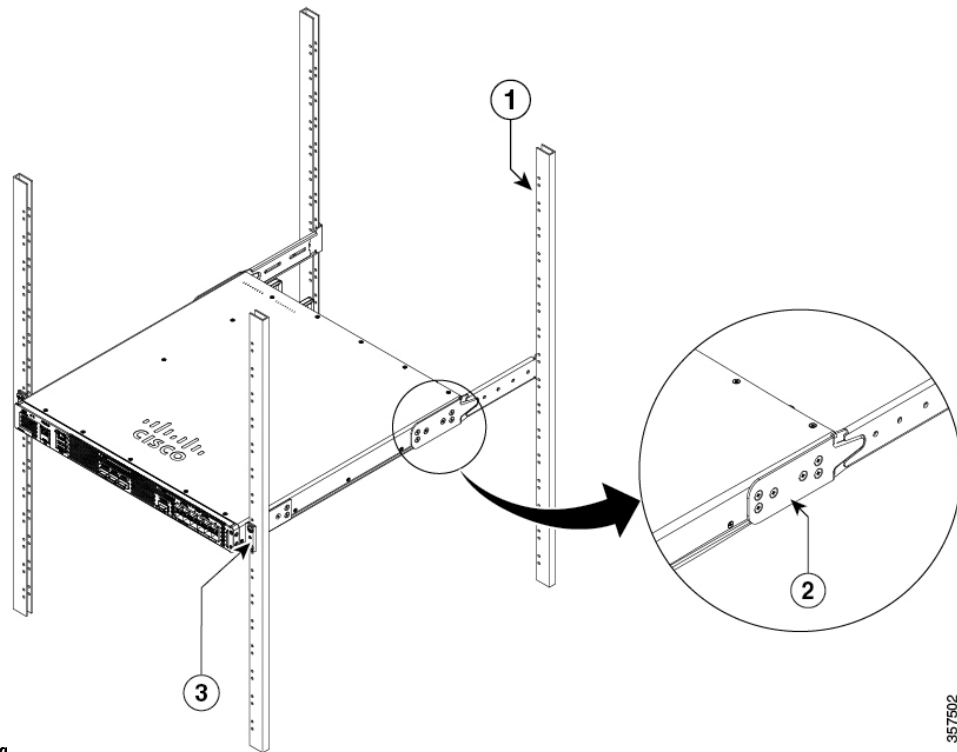
Rack-Mounting

1	Rear rack equipment rail	3	Front rack mount bracket ear and screws

2	Rear rack mount bracket ear and screws		

Figure 23: Cisco 8500-20X6C in a Four-Post Rack—Front and Rear Rack-Mounting

1	Rear rack equipment rail	3	Front rack equipment rail
2	Rear rack mount bracket and screws	4	Front rack mount bracket and screws

Step 7 Use a level to verify that the tops of the two brackets are level, or use a measuring tape to verify that both brackets are the same distance from the top of the rack rails.

Attaching the Cable Management Bracket

The cable management brackets should be mounted to each rack-mount bracket on the chassis to provide cable management to both sides of the chassis (parallel with card orientation). These brackets are screw-mounted to the rack-mount brackets to allow easy installation and removal of cables.

The cable-management brackets for the Cisco Catalyst 8500 Series Edge Platform contain one independent cable-management U-type feature with two screws for each bracket.

Note Make certain that the cable-management bracket "U" feature is facing upwards when you attach it to the C8500-12X4QC or C8500-12X chassis.
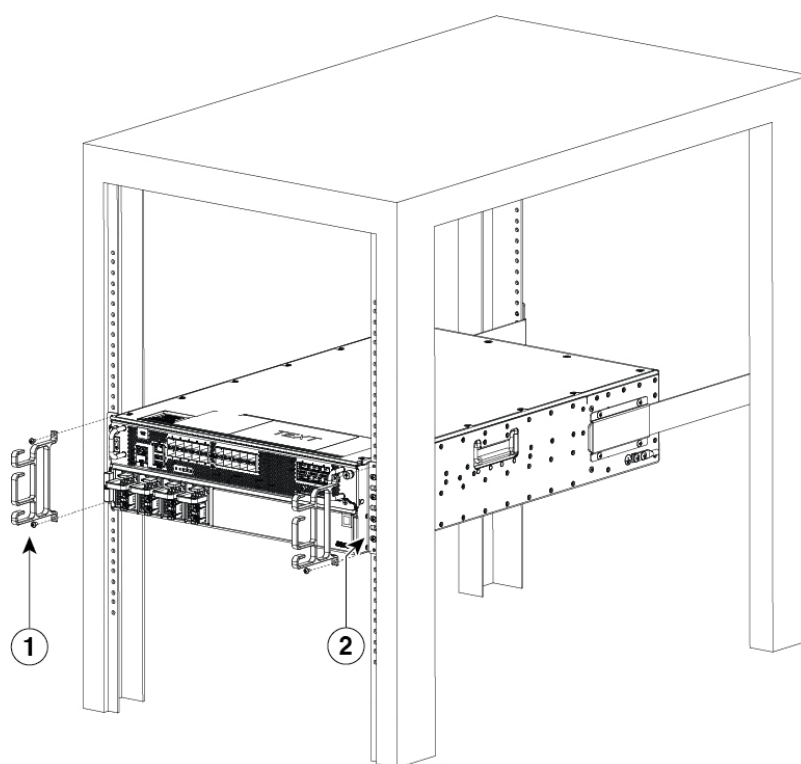
Procedure

Step 1   Align the cable-management bracket to the rack-mount bracket on one side of the Cisco Catalyst 8500 Series Edge Platform. The cable-management bracket aligns to the top hole of the chassis rack-mount bracket.

Step 2   Using a Phillips screwdriver, insert one screw through the top screw hole of the cable-management bracket and into the chassis rack-mount bracket and tighten the screw.

Note   Use the package of screws that came with your chassis containing four screws.

The following figures show where to attach the cable-management brackets to the Cisco Catalyst 8500 Series Edge Platforms.

Figure 24: Attaching the Cable-Management Brackets to C8500-20X6C

1	Front cable-management bracket.
2	Front-rack mount bracket.

Step 3   Insert a screw through the hole in the cable management bracket and tighten using a Phillips screwdriver.

Step 4   Repeat Step 1 through Step 3 for the other side of the chassis.

Chassis Ground Connection

Connecting the Cisco Catalyst 8500 Series Edge Platform chassis to ground is required for all DC powered installations and any AC powered installation where compliance with Telcordia grounding requirements is necessary.

⚠️

Warning   This equipment must be grounded. To reduce the risk of electric shock, never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

Before you connect power or turn on power to your chassis, you must provide an adequate chassis ground (earth) connection for the chassis. A chassis ground connector is provided on Cisco Catalyst 8500 Series Edge Platform. There is a stud on the rear left side of the chassis.

⚠️

Caution   The grounding wire should always be the first to be installed or connected and the last to be removed or disconnected.

Have the recommended tools and supplies available before you begin this procedure.

Recommended Tools and Supplies

The following tools, equipment, and supplies are necessary to connect the system ground to the chassis:

- Phillips screwdriver
- 3.5-mm flat blade screwdriver (Phoenix # 1205053 or equivalent 3.5-mm flat blade)
- Dual-lug chassis ground component
- Grounding wire

Attaching a Chassis Ground Connection

Procedure

Step 1   Use the wire stripper to strip one end of the AWG #6 wire approximately 0.75 inches (19.05 mm).

Step 2   Insert the AWG #6 wire into the open end of the grounding lug.

Step 3   Use the crimping tool to carefully crimp the wire receptacle around the wire. This step is required to ensure a proper mechanical connection.

Step 4   Locate the chassis ground connector on the side of your chassis.

Step 5   Insert the two screws through the holes in the grounding lug.

The following figures show how to attach a grounding lug to the chassis ground connector.

Figure 25: Attaching a Grounding Lug to the C8500-12X4QC and C8500-12X Chassis Ground Connector
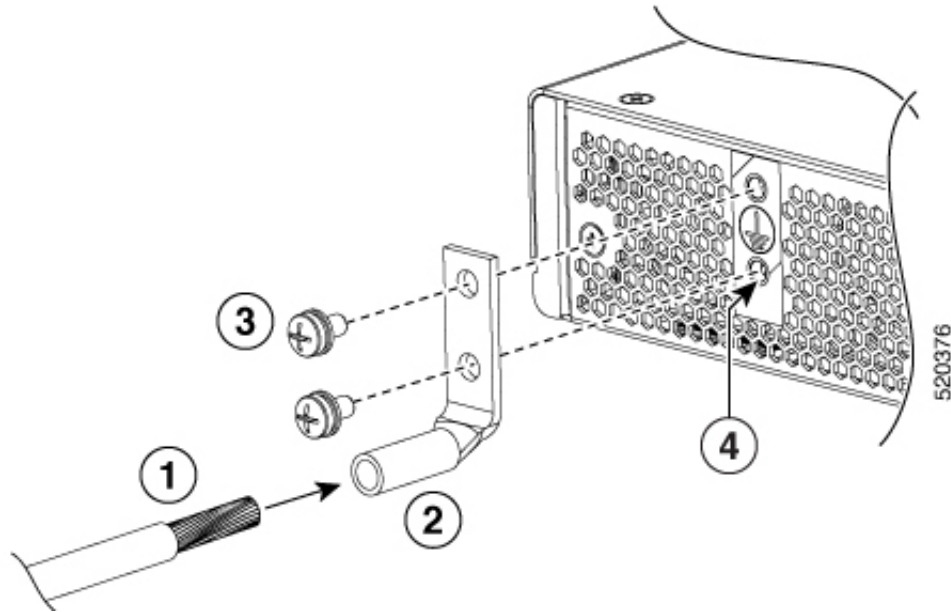
1	Chassis ground lead wire	3	Ground screws
2	Grounding lug	4	Chassis ground connector holes

Figure 26: Attaching a Grounding Lug to the C8500-20X6C Chassis Ground Connector

1	Chassis ground connector holes	3	Ground screws
2	Grounding lug		

Step 6   Use the Number 2 Phillips screwdriver to carefully tighten the screws until the grounding lug is held firmly to the chassis. Do not over tighten the screws.

Step 7   Connect the opposite end of the grounding wire to the appropriate grounding point at your site to ensure an adequate chassis ground.

Connecting Cables

Keep the following guidelines in mind when connecting any external cable to the Cisco Catalyst 8500 Series Edge Platform:

- To reduce the chance of interference, avoid crossing high-power lines with any interface cables.

- Verify all the cabling limitations (particularly distance) before powering on the system.

Connecting the Console Port Cables

The router uses RJ-45 port to attach a console terminal. The router has an asynchronous serial (EIA/TIA-232) RJ-45 console port labeled CON on its front panel. You can connect this port to most types of video terminals with a console cable kit that is included with your router. The console cable kit contains:

- One RJ-45-to-RJ-45 crossover cable

A crossover cable reverses pin connections from one end to the other. In other words, it connects pin 1 (at one end) to pin 8 (at the other end), pin 2 to pin 7, pin 3 to pin 6, and so on. You can identify a crossover cable by comparing the two modular ends of the cable. Hold the cable ends in your hand, side-by-side, with the tabs at the back. Ensure that the wire connected to the outside (left) pin of the left plug (pin 1) is the same color as the wire connected to the outside (right) pin of the right plug (pin 8).

The console port is an asynchronous serial ports; devices connected to this ports must be capable of asynchronous transmission. Baud rates for the RJ-45 console port are 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 bps.

Before connecting to the console interface on the router using a terminal or PC, perform the following steps:

Procedure

Step 1   Before connecting a terminal to the console port, configure the terminal to match the chassis console port as follows: 9600 baud, 8 data bits, no parity, 1 stop bits (9600 8N1).

Step 2   Connect one end of the RJ-45 cable to the serial RJ-45 console port (CON) .

Note   For information about how to change the default settings to meet the requirements of your terminal or host, see the *Cisco IOS Terminal Services Configuration Guide*.

Step 3   After you establish normal router operation, you can disconnect the terminal.

Connecting to the USB 3.0 Console Interface

The USB 3.0 interface connects directly to the USB connector of a PC using a USB Type A to 5-pin micro USB Type-B cable. The USB 3.0 interface supports full speed (12Mbps) operation. The interface does not support hardware flow control.

Note
- Always use shielded USB cables with a properly terminated shield. The USB serial console interface cable must not exceed 3 meters in length.

- Only one interface can be active at a time. When a cable is plugged into the USB 3.0 interface, the RJ-45 port becomes inactive. Conversely, when the USB cable is removed from the USB 3.0 interface, the RJ-45 port becomes active.

- 4-pin micro USB Type-B connectors are easily confused with 5-pin micro USB Type-B connectors. Note that only the 5-pin micro USB Type-B is supported.

The default parameters for the interface are 9600 baud, 8 data bits, no parity, and 1 stop bit.

For operation with a Microsoft Windows OS version older than Windows 7, the Cisco Windows USB Console Driver must be installed on any PC connected to the interface. If the driver is not installed, prompts guide you through a simple installation process.

The Cisco Windows USB Console Driver allows plugging and unplugging the USB cable from the interface without affecting Windows HyperTerminal operations. No special drivers are needed for Mac OS X or Linux.

Management Ethernet Port Cable Connection

⚠

Caution   To comply with Class A emission requirements, a shielded Ethernet cable must be used for the connection.

Procedure

Step 1   Insert an Ethernet RJ-45 cable into the MGMT port.

Step 2   Insert the other end of the RJ-45 cable to your management device or network.

Removing and Replacing FRUs

This chapter describes procedures for removing and replacing field-replaceable units (FRUs) from Cisco Catalyst 8500 Series Edge Platform.

## Installing an SSD

Before you begin

Note   The following section does not apply to the C8500-20X6C chassis. Do not remove the top cover of the C8500-20X6C chassis as it does not include any user serviceable parts.

Ensure that you follow the guidelines in *Preventing Electrostatic Discharge Damage*

Procedure

Step 1   Ensure the router is powered off and all the power supplies are removed from the chassis.

Step 2   If the router is mounted on a rack, remove the screws from the rack mounting brackets. Remove all screws from the sides and top of the chassis that secure the cover. There are 12 screws on the top and 5 screws on
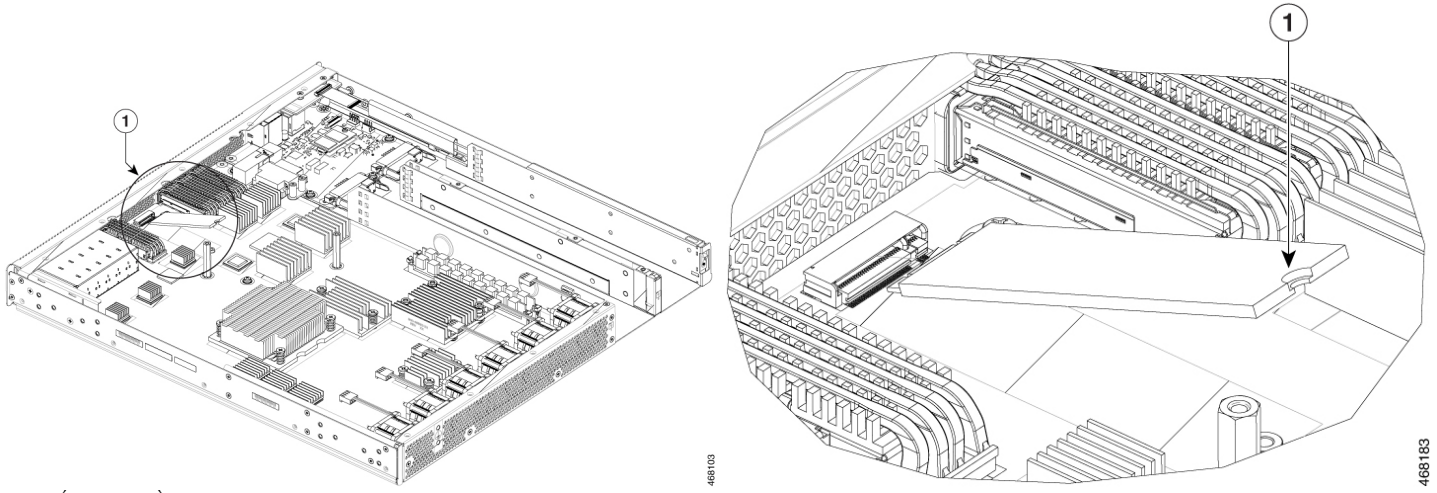
each side.
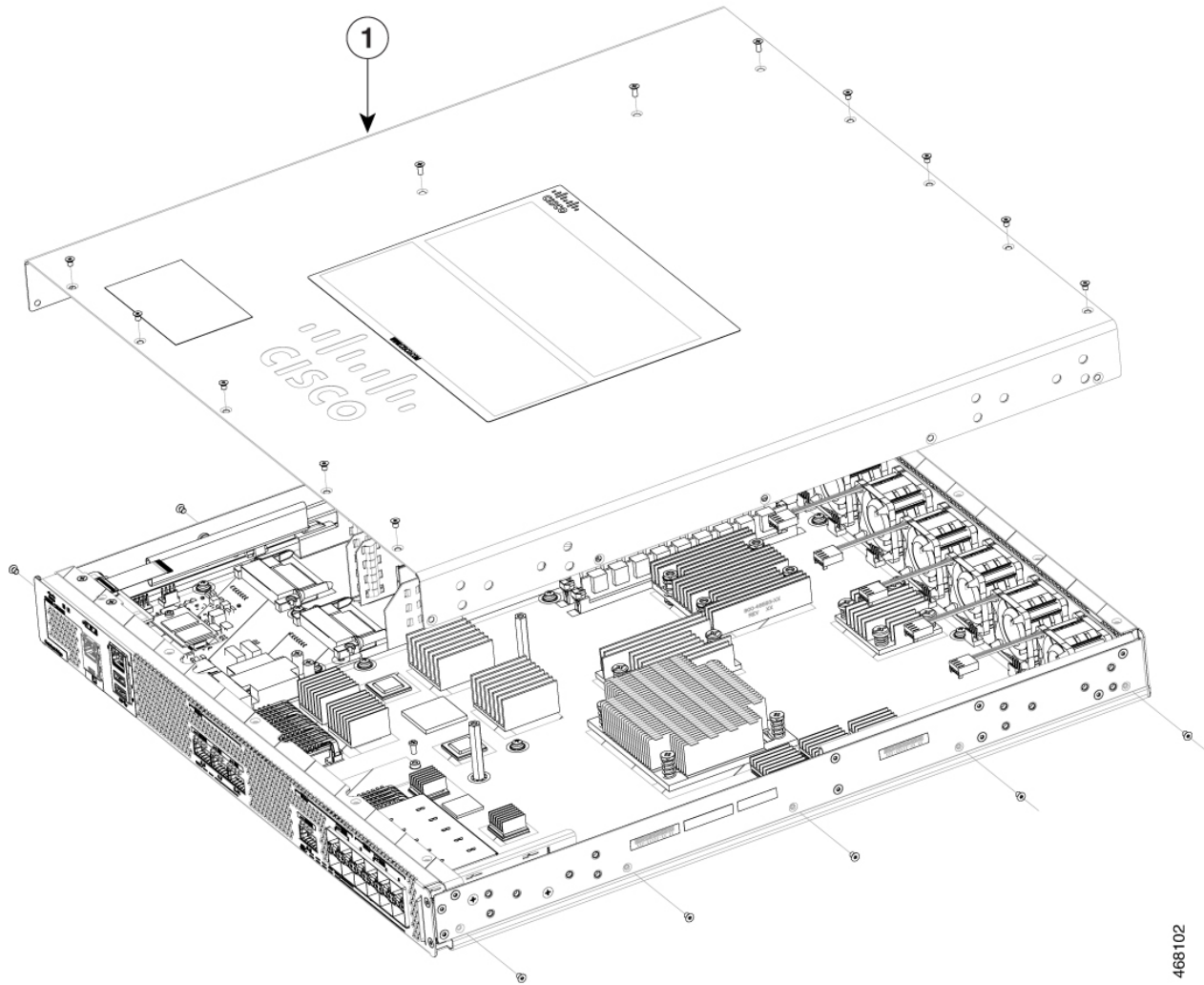
| 1	Top cover of the chassis after removing screws from the top and side

Step 3   Locate the SSD slot. Carefully insert the SSD at approximately a 30 degree angle to seat the card in the connector. Rotate the card downward until it rests on the small notch in the printed circuit

1	The SSD card inserted in the notch in the PCB

Step 4   Install the retention screw in the hole in the SSD and gently tighten to a torque to no greater than 5 in-lbs
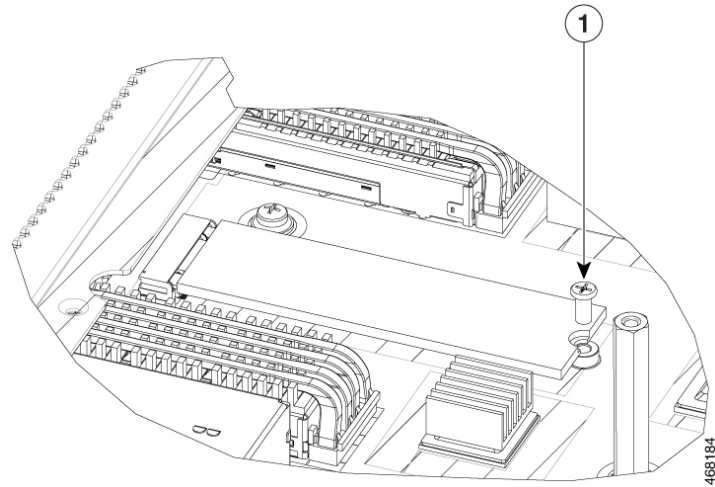
Step 5   Re-install the cover and replace all screws that were removed in step 1.

Removing an SSD

Before you begin

Ensure that you follow the guidelines in *Preventing ESD Damage*

Note The following section does not apply to the C8500-20X6C chassis. Do not remove the top cover of the C8500-20X6C chassis as it does not include any user serviceable parts.

Procedure

Step 1 Ensure the router is powered off and all the power supplies are removed from the chassis.

Step 2 Remove the screw retaining the SSD. Keep the screw for inserting a new SSD
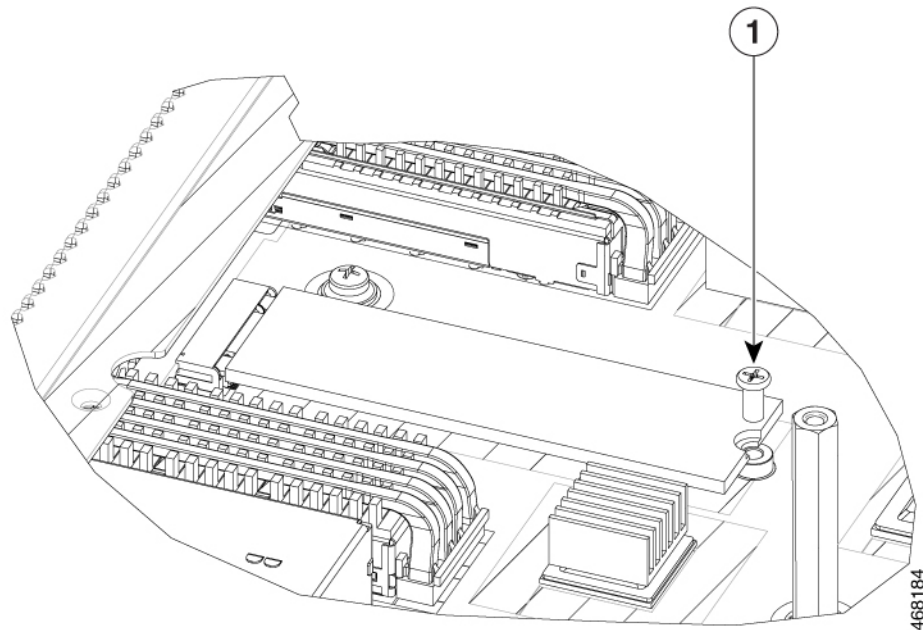
module.

1	The screw retaining the SSD

Step 3 After the screw is removed, the SSD module will automatically spring up.

Step 4 Remove the SSD from the socket.

Installing AC Power Supplies

Note Do not install the power supplies with the chassis cover off.

Procedure

Step 1 Ensure that the chassis power switch on the chassis is in the Standby position.

> **Note** It is not required to place the chassis power switch in the Standby position if you want to hot-swap a single power supply.

Step 2 Insert the power supply module into the appropriate slot(s), making sure that the retention latch is firmly placed. You can verify that the power supply module is firmly latched by gently pulling the power supply handle.

Step 3 Insert the power supply cables firmly into the power supplies.

> **Note** Ensure that both power supplies are inserted firmly and the power cords are in place.

Step 4 If you have changed the chassis power switch to the Standby position in Step 1, press the power switch to the On position.

The power supply LEDs are illuminated (green).

Removing AC Power Supplies

Procedure

Step 1 Ensure that the chassis power switch is in the Standby position.

> **Note** It is not required to place the chassis power switch in the Standby position if you want to hot-swap a single power supply.

Step 2 Unplug the power cable from the power supply.

Step 3 Press the retaining latch towards the pull handle, grasp the handle with one hand, and pull the power supply out of the slot while supporting the weight of the power supply with the other hand.

Step 4 Repeat these steps if it is required to remove the other AC power supply.

Installing DC Input Power Supplies

Warning To reduce risk of electric shock, before performing any of the following procedures, ensure that power is removed from the system.

⚠️

Warning   Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

✎

Note   Do not install the power supplies with the chassis cover off.

This section describes how to install the DC power supply input power leads to the DC input power supply. Before you begin, read these important notices:

- The color coding of the DC input power supply leads depends on the color coding of the DC power source at your site. Ensure that the lead color coding you choose for the DC input power supply matches the lead color coding used at the DC power source and verify that the power source is connected to the negative (–) terminal and to the positive (+) terminal on the power supply.

- Ensure that the chassis ground is connected on the chassis before you begin installing the DC power supply. Follow the steps provided in the *Chassis Ground Connection* section.

- For DC input power cables, the wire gauge is based on the National Electrical Code (NEC) and local codes for 26 amp service at nominal DC input voltage (–40/–72 VDC). One pair of cable leads, source DC (–) and source DC return (+), are required for each power distribution unit (PDU). These cables are available from any commercial cable vendor. All DC input power cables for the chassis should be 10 gauge wire and cable lengths should match within 10 percent of deviation.

Each DC input power cable is terminated at the PDU by a cable lug, as shown in the following figure.

✎

Note   DC input power cables must be connected to the PDU terminal studs in the proper positive (+) and negative (–) polarity. In some cases, the DC cable leads are labeled, which is a relatively safe indication of the polarity. However, you must verify the polarity by measuring the voltage between the DC cable leads. When making the measurement, the positive (+) lead and the negative (–) lead must always match the (+) and (–) labels on the power distribution unit.
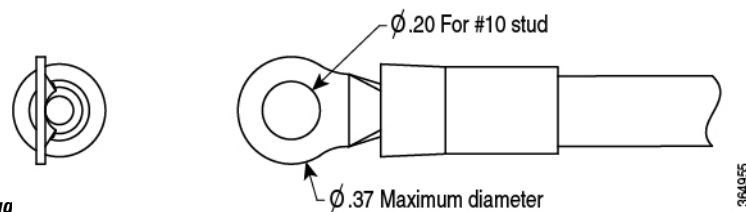

Figure 27: DC Input Power Cable Lug

✎

Note   To avoid hazardous conditions, all components in the area where DC input power is accessible must be properly insulated. Therefore, before installing the DC cable lugs, be sure to insulate the lugs according to the manufacturer's instructions.

Wiring the DC Input Power Source

⚠

Warning To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

Procedure

Step 1 Turn off the circuit breaker from the power source.

Step 2 Ensure that the chassis power switch is in the Standby position.

Note It is not required to place the power switch in the Standby position if you want to hot-swap a single power supply.

Step 3 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the wire.

Figure 28: DC Power Supply Terminal Block Ground Cable Lugs
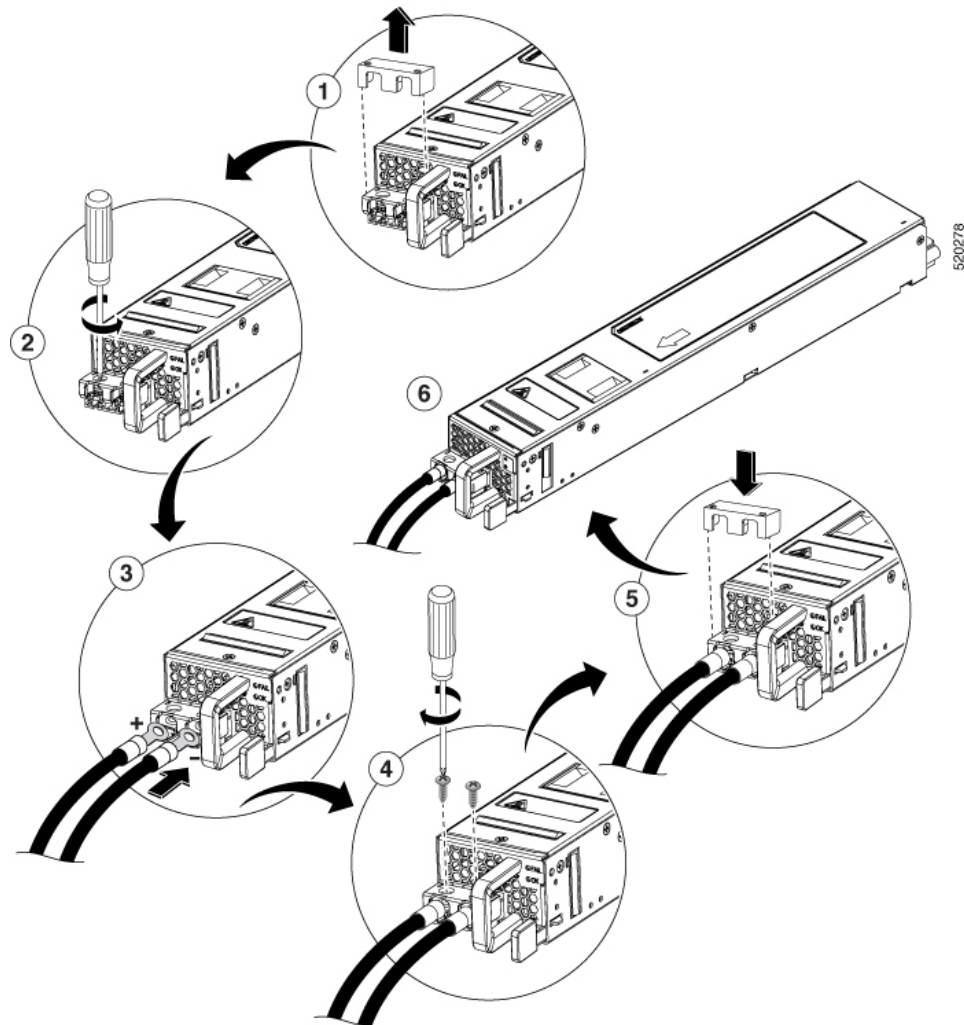
Step 4   Insert the stripped end of the wire into the open end of the lug.

Step 5   Crimp the wire in the barrel of the lug. Verify that the wire is securely attached to the lug.

Step 6   Place the wire against the terminal block, making sure there is solid metal to metal contact.

Step 7   Secure the lug to the chassis with two M4 screws. Ensure that the lug and the wire will not interfere with other switch hardware or rack equipment.

Step 8   Replace the snap on cover on the terminal block of the DC power supply.

Removing DC Power Supplies

The DC power supply has a terminal block that is installed into the power supply terminal block header.

Procedure

Step 1 Turn off the circuit breaker from the power source.

Step 2 Ensure that the chassis power switch is in the Standby position.

Note It is not required to place the chassis power switch in the Standby position if you want to hot-swap a single power supply.

Step 3 Remove the plastic cover from the terminal block.

Step 4 Unscrew the two terminal block screws on the unit and remove the wires from the power supply.

Step 5 Press the power supply retaining latch towards the pull handle, grasp the handle with one hand, and pull the power supply out of the slot while supporting the weight of the power supply with the other hand.

Removing and Replacing USB 3.0 Interface

The Cisco Catalyst 8500 Series Edge Platform contain one USB 3.0 interface to store configurations or Cisco IOS XE consolidated packages.

To remove and then replace a USB flash memory stick, follow these steps:

Procedure

Step 1 Pull the flash memory stick from the USB port.

Step 2 To replace a Cisco USB Flash memory stick, insert the module into USB port 0 or 1. The Flash memory stick can be inserted only in one way, and can be inserted or removed regardless of whether the router is powered up or not.

Removing and Replacing a DIMM

Note The following section does not apply to the C8500-20X6C chassis. Do not remove the top cover of the C8500-20X6C chassis as it does not include any user serviceable parts.

The Cisco Catalyst 8500 Series Edge Platform has two DIMM slots and supports 16-GB configuration by default.

Table 6: Supported Slots for Inserting the DIMMs

Memory PID Option	Memory Channel B	
	Slot 0 (U1DA0)	Slot 2 (U1DB0)

Memory PID Option	Memory Channel B	
MEM-C8500-16GB	8 GB	8 GB
MEM-C8500-32GB	16 GB	16 GB
MEM-C8500-64GB	32 GB	32 GB

# Removing a DIMM

Before you begin

Perform the following steps before you begin the process of removing and replacing a DIMM from a Cisco Catalyst 8500 Series Edge Platform:

- Use an ESD-preventive wrist strap.

- Back up the data that you want to save.

- Remove the power supplies before you remove the chassis top cover.

Procedure

Step 1 With an ESD wrist strap on, remove the power supplies from the chassis.

Step 2 Remove the chassis top cover by performing the following steps:

a) Remove the nine Torx screws on the top surface of the cover, along with the five Torx screws on each side of the cover, using a Torx T8 driver. Then, remove the remaining three screws on the top surface of the cover with a small Phillips screwdriver.

b) Remove the five screws from the left side of the chassis and five screws from the right side of the chassis.

c) After removing the screws, lift off the chassis cover.

Step 3 Locate the DIMMs on the router.

Figure 29: DIMM Location in Cisco C8500 Series Catalyst Edge Router
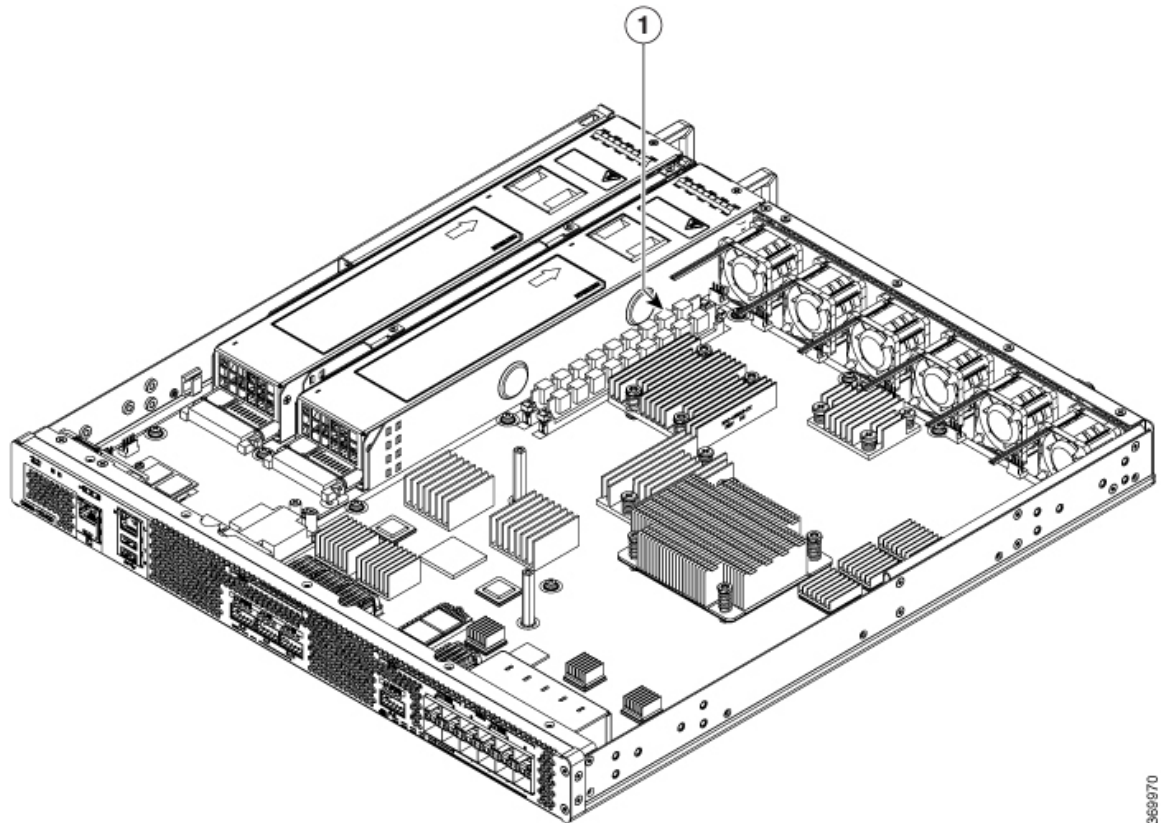
1	C8500 Series Catalyst Edge Router DIMM location slot

Step 4 Pull down the DIMM module spring latches to release the corresponding DIMM from the socket.

Step 5 When both ends of the DIMM are released from the socket, grasp each end of the DIMM with your thumb and forefinger and pull the DIMM completely out of the socket. Handle only the edges of the DIMM; avoid touching the memory module, pins, and the metal traces (the metal fingers along the connector edge of the DIMM) along the socket edge.

Step 6 Place the DIMM in an antistatic bag to protect it from ESD damage.

Replacing a DIMM

Procedure

Step 1 Place the DIMM on an antistatic mat or pad while wearing an antistatic device, such as a wrist strap.

Caution DIMMs are sensitive components that can be shorted by mishandling; they are susceptible to ESD damage. Handle the DIMM by the edges only, and avoid touching the pins.

Step 2   Remove the new DIMM from the antistatic bag.

Step 3   Locate the polarization notch and align the DIMM with the socket before inserting it.

Step 4   Gently insert the new DIMM, taking care not to damage the pins on the edge of the DIMM. Press the top of the DIMM towards the socket, being careful to apply force only on the DIMM that is parallel with the plane of the DIMM.

> **Caution**   When inserting DIMMs, use firm but not excessive pressure. If you damage a socket, you will have to return the router to the factory for repair.

.

Step 5   Use light insertion force and insert smoothly, but ensure that the DIMM is inserted straight. If necessary, rock the DIMM gently back and forth to seat it properly. The following figure shows how to install the DIMM in the socket.

Figure 30: Installing a DIMM in the Socket
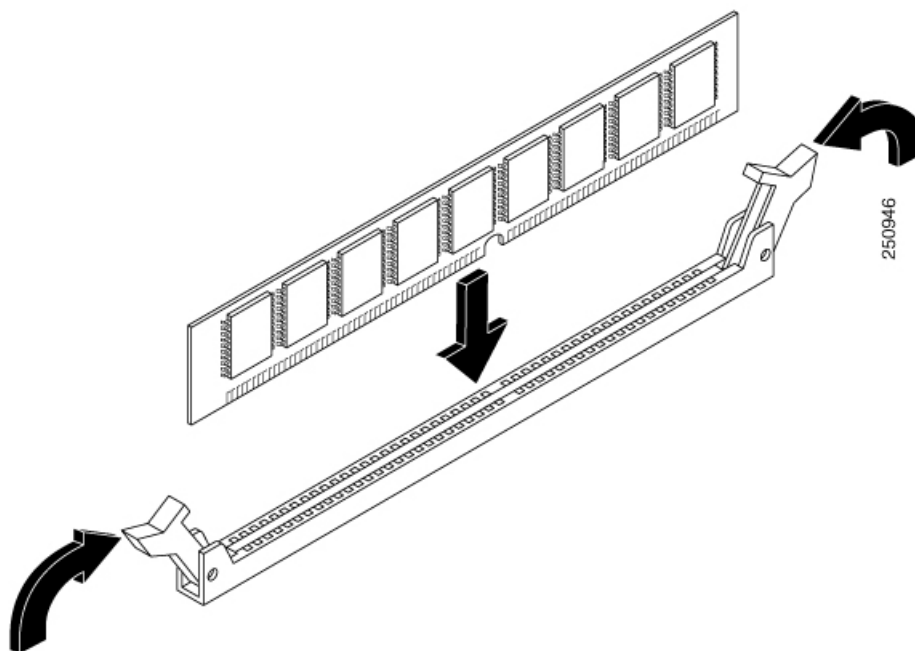
Step 6   After the DIMM is installed, check whether the release levers are flush against the sides of the DIMM socket. If they are not, the DIMM might not be seated properly. If the DIMM appears misaligned, carefully remove it according to the removal procedure and then reseat it in the socket. Push the DIMM firmly back into the socket until the release levers are flush against the sides of the DIMM socket.

Step 7   Replace the chassis top cover. Install the top surface screws, side screws and tighten them slightly

Step 8   Install the power supplies into the chassis and power up the router.

Removing and Replacing Fans

## Removing the Fans for C8500-12X4QC and C8500-12X

Before you begin

Perform the following steps before you begin the process of removing the fans :

- Use an ESD-preventive wrist strap.

- Back up the data that you want to save.

- Remove the power supplies before you remove the chassis top cover.

Procedure

Step 1   Remove the chassis top cover by performing the following steps:
    a)   Remove the twelve top surface screws on the chassis cover.
    b)   Remove the five screws from the left side of the chassis and five screws from the right side of the chassis.
    c)   Lift the chassis cover.

Step 2   Position the chassis so that you have the most comfortable access to the chassis to remove the fans.

    The fans are located at the rear of the chassis.

Step 3   Unplug the six fan connectors from the motherboard.

Step 4   Remove the three screws from the rear of the chassis as shown in the following figure.
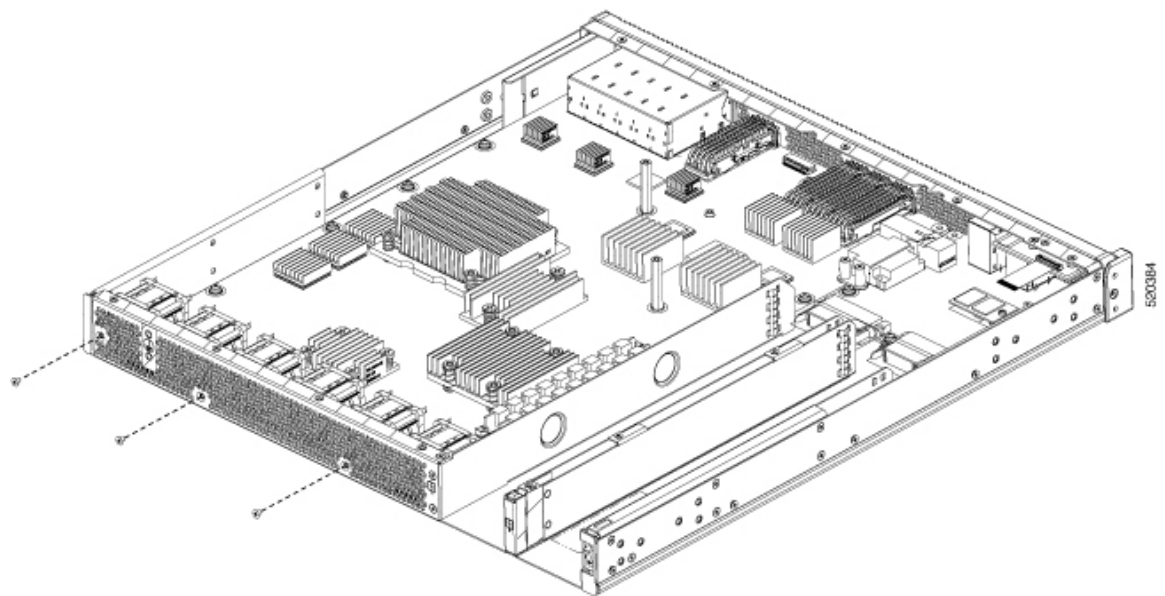
Step 5   Rotate the fan tray slightly forward, and then lift it out of the chassis.

Step 6   Reverse the order of fan removal to install the new fan tray. Ensure that all fans are connected and all screws for the fan tray and chassis cover are replaced prior to powering up the chassis.
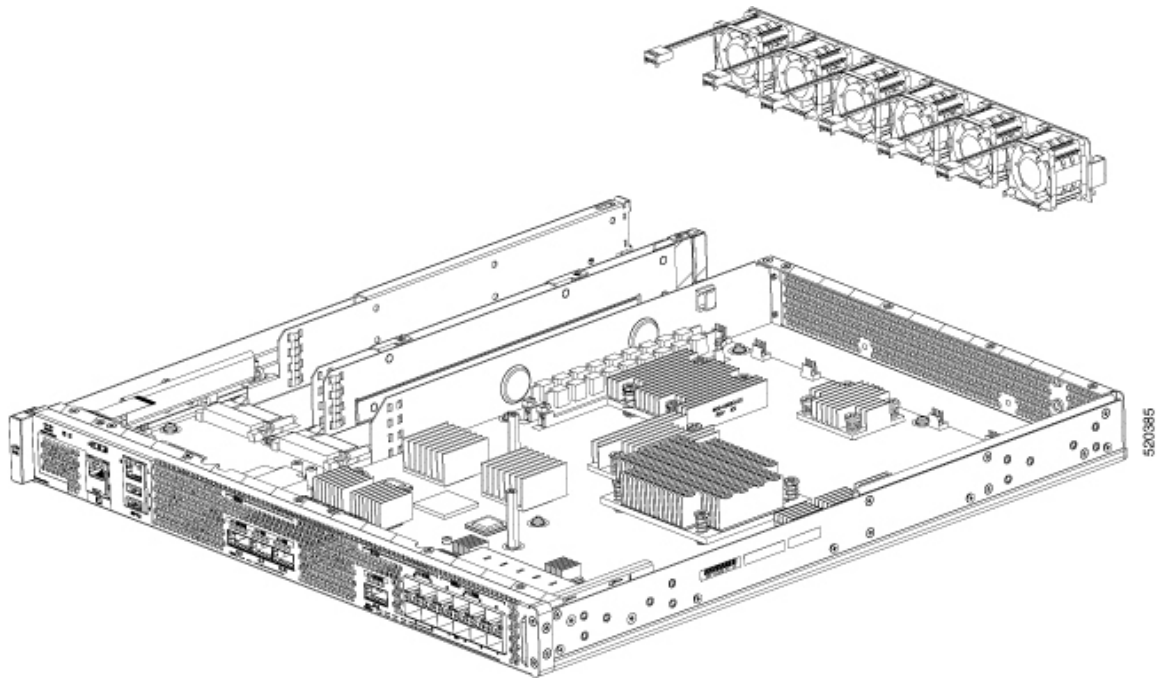
Removing the Fans for C8500-20X6C

Procedure

Step 1   **Note**   During fan removal and installation, keep fingers and all other objects away from the chassis opening.

Position the chassis so that you have the most comfortable access to the chassis to remove the fans. The fans are located at the rear of the chassis.

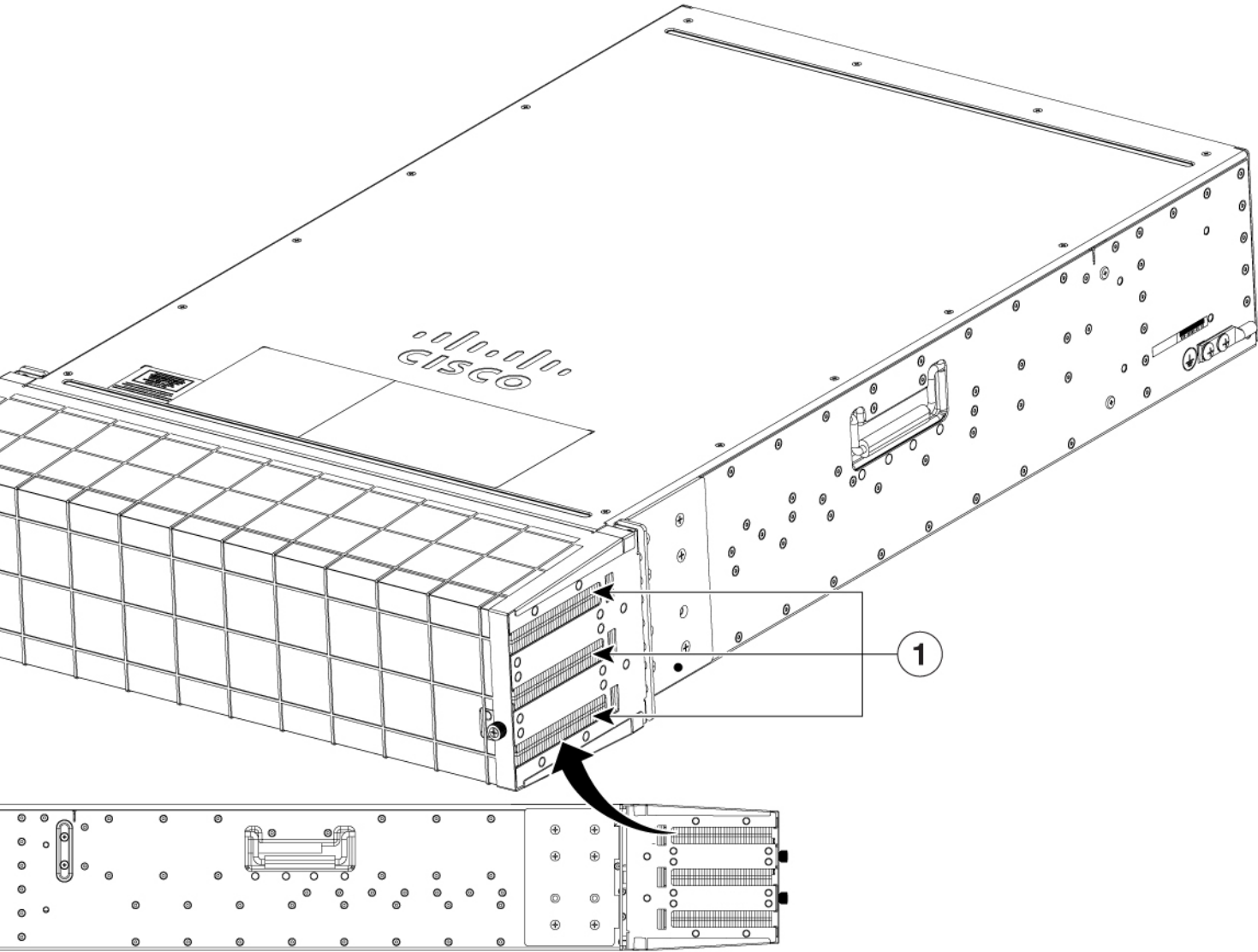**Step 2**   Press the finger tab on the fan latch and pull the fan module straight out to remove the fan.

Figure 31: Removing the Fans for C8500-20X6C
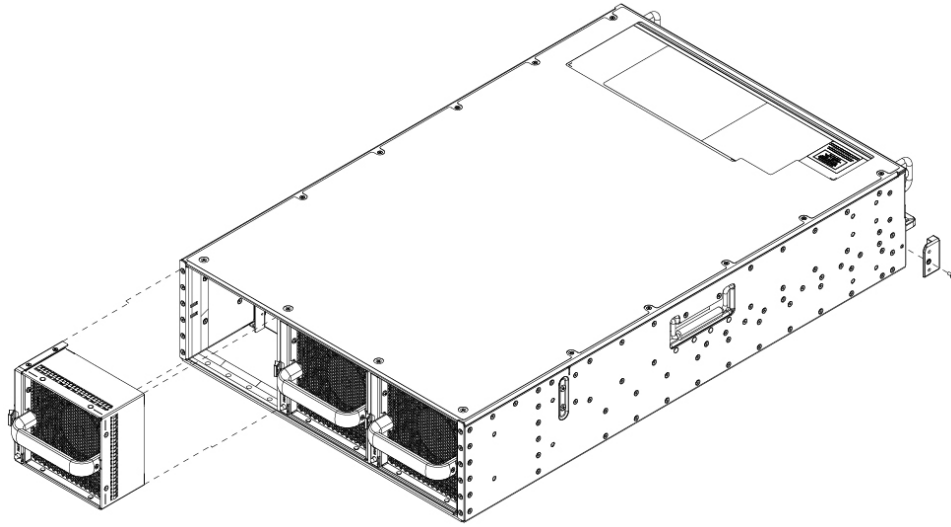
Step 3   Replace the fan module within 3 minutes to maintain proper cooling of the chassis.

Installation and Removal of Air Filter

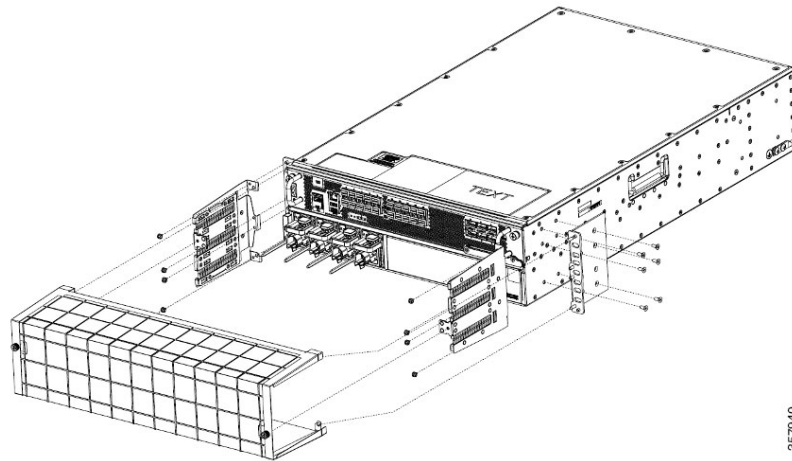**Figure 32: Side View and Front view of Chassis with Air Filter and Cable Management**

| 1 | Cable Exit Areas |

Installing the Air Filter

Figure 33: Exploded View of Air Filter Components


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Procedure

Step 1	If the chassis is installed without a filter, it must be powered down and removed from the rack.
Step 2	Install the rack mount brackets as shown in the above figure, using 6 screws per rack mount bracket to mount to the chassis.
Step 3	Align and install the air filter mounting brackets to the front rack mount brackets. Use 4 pan head screws per side.
Step 4	Route the power and data cables to the left and right, through the bristles in the air filter mounting brackets.
Step 5	Power on the chassis.
Step 6	Carefully slide the air filter over the mounting brackets and secure the air filter by tightening the thumb screws on the air filter to the mounting brackets.

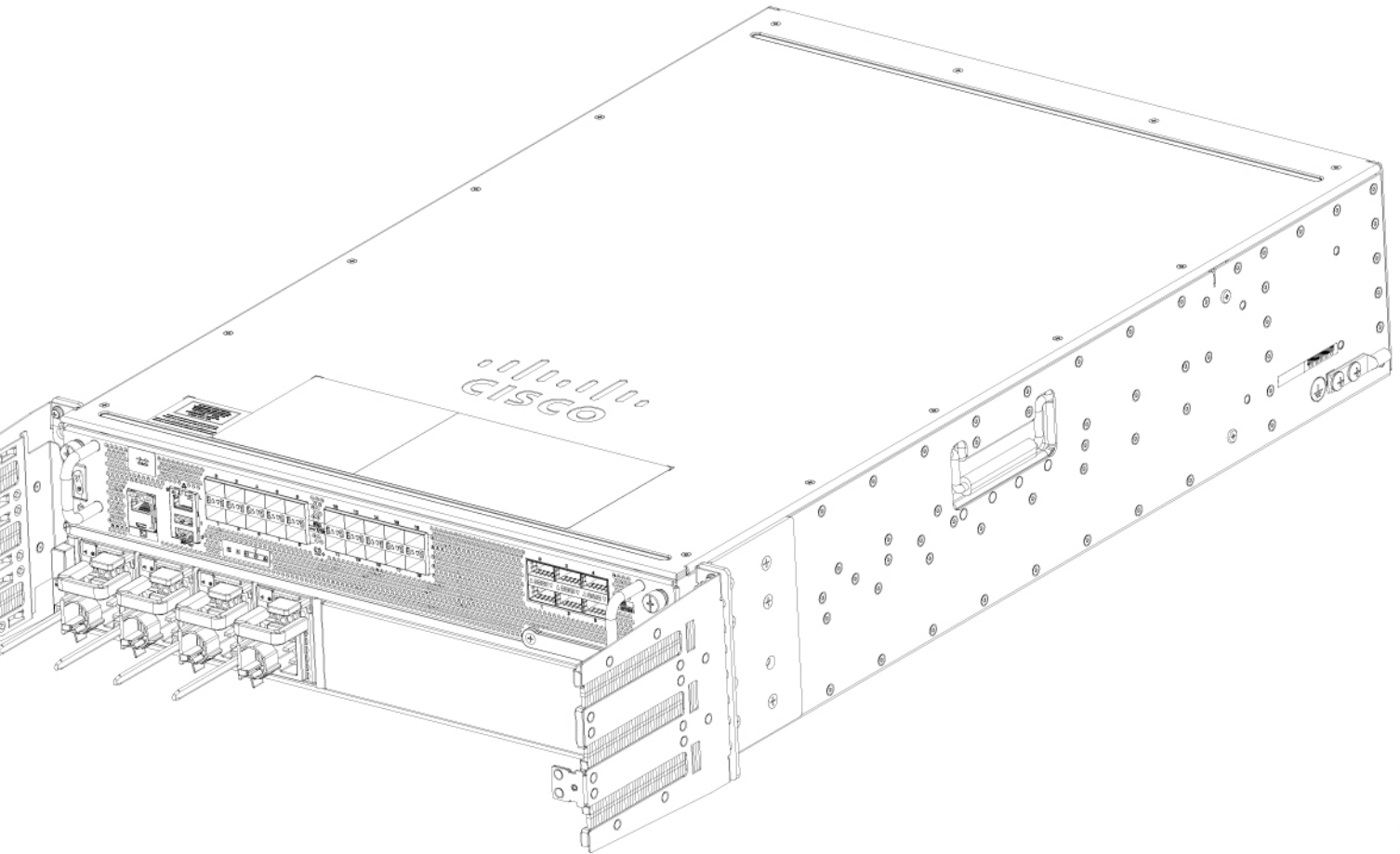# Removing the Air Filter

Figure 34: The Air Filter
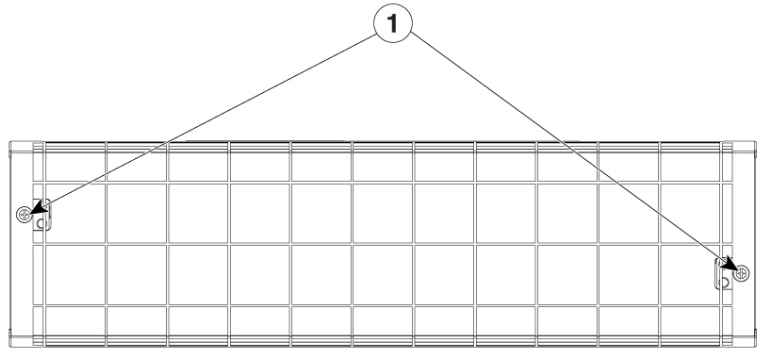
1	Air filter thumbscrews

Procedure

Step 1   Fully loosen the two thumbscrews (as shown in the above figure) on the front of the filter by turning them counter clockwise.

Step 2   Pull the air filter straight off the air filter mounting brackets.

Step 3   Discard the used air filter.

Figure 35: Figure: Chassis With Air Filter

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Repacking the Router

If your system is damaged, you must repack it for return shipment.

Before you return the router or move the router to a different location, repack the system using the original packaging material.