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Cisco MDS 9250i Multiservice Fabric Switch Hardware Installation Guide

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Preface

This preface describes the audience, organization, and conventions of the *Cisco MDS 9250i Multiservice Fabric Switch Hardware Installation Guide*. It also provides information on how to obtain related documentation.

Audience

To use this installation guide, you must be familiar with electronic circuitry and wiring practices and preferably be an electronic or electromechanical technician.

Organization

This guide is organized as follows:

Chapter	Title	Description
Chapter 1	Cisco MDS 9250i Multiservice Fabric Switch Overview	Provides an overview of the Cisco MDS 9250i Multiservice Fabric Switch and its components.
Chapter 2	Installing the Cisco MDS 9250i Switch	Describes how to install the Cisco MDS 9250i Multiservice Fabric Switch including installing the chassis, modules, power supplies, and fan assembly.
Chapter 3	Connecting the Cisco MDS 9250i Switch	Describes how to connect the Cisco MDS 9250i Multiservice Fabric Switch including the modules.
Appendix A	Rack Installation	Provides guidelines for selecting a rack and the procedure for installing a switch using the optional Telco and EIA Shelf Bracket Kit.
Appendix B	Technical Specifications	Lists the Cisco MDS 9250i Multiservice Fabric Switch specifications, and includes safety information, site requirements, and power connections.

Chapter	Title	Description
Appendix C	Cable and Port Specifications	Lists cable and port specifications for the Cisco MDS 9250i Multiservice Fabric Switch
Appendix D	Site Planning and Maintenance Records	Provides a site-planning checklist and sample maintenance and network records.

Conventions

This document uses the following conventions for notes, cautions, and safety warnings.

Notes and Cautions contain important information that you should be aware of.



Note

Means *reader take note*. Notes contain helpful suggestions or references to material that are not covered in the publication.



Caution

Means *reader be careful*. You are capable of doing something that might result in equipment damage or loss of data.

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



Warning

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. Statement 1071

Waarschuwing

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.

Varoitus

Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).

Attention	Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document <i>Regulatory Compliance and Safety Information</i> (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.
Warnung	Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument <i>Regulatory Compliance and Safety Information</i> (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.
Avvertenza	Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento <i>Regulatory Compliance and Safety Information</i> (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.
Advarsel	Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet <i>Regulatory Compliance and Safety Information</i> (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.
Aviso	Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento <i>Regulatory Compliance and Safety Information</i> (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.
¡Advertencia!	Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado <i>Regulatory Compliance and Safety Information</i> (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.

Varning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förekommer i denna publikation i dokumentet *Regulatory Compliance and Safety Information* (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

Related Documentation

The documentation set for the Cisco MDS 9000 Family includes the following documents. To find a document online, use the Cisco MDS NX-OS Documentation Locator at:

http://www.cisco.com/en/US/docs/storage/san_switches/mds9000/roadmaps/doclocator.htm

Release Notes

- *Cisco MDS 9000 Family Release Notes for Cisco MDS NX-OS Releases*
- *Cisco MDS 9000 Family Release Notes for MDS SAN-OS Releases*
- *Cisco MDS 9000 Family Release Notes for Storage Services Interface Images*
- *Cisco MDS 9000 Family Release Notes for Cisco MDS 9000 EPLD Images*

Regulatory Compliance and Safety Information

- *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*

Compatibility Information

- *Cisco Data Center Interoperability Support Matrix*
- *Cisco MDS 9000 NX-OS Hardware and Software Compatibility Information and Feature Lists*
- *Cisco MDS NX-OS Release Compatibility Matrix for Storage Service Interface Images*
- *Cisco MDS 9000 Family Switch-to-Switch Interoperability Configuration Guide*
- *Cisco MDS NX-OS Release Compatibility Matrix for IBM SAN Volume Controller Software for Cisco MDS 9000*
- *Cisco MDS SAN-OS Release Compatibility Matrix for VERITAS Storage Foundation for Networks Software*

Hardware Installation

- *Cisco MDS 9710 Hardware Installation Guide*
- *Cisco MDS 9500 Series Hardware Installation Guide*

- *Cisco MDS 9200 Series Hardware Installation Guide*
- *Cisco MDS 9100 Series Hardware Installation Guide*
- *Cisco MDS 9124 and Cisco MDS 9134 Multilayer Fabric Switch Quick Start Guide*

Software Installation and Upgrade

- *Cisco MDS 9000 Family Storage Services Interface Image Install and Upgrade Guide*
- *Cisco MDS 9000 Family Storage Services Module Software Installation and Upgrade Guide*

Cisco NX-OS

- *Cisco MDS 9000 Family NX-OS Licensing Guide*
- *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*
- *Cisco MDS 9000 Family NX-OS System Management Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Interfaces Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Fabric Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Quality of Service Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Security Configuration Guide*
- *Cisco MDS 9000 Family NX-OS IP Services Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Intelligent Storage Services Configuration Guide*
- *Cisco MDS 9000 Family NX-OS High Availability and Redundancy Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Inter-VSAN Routing Configuration Guide*

Cisco Data Center Network Manager

- *Cisco DCNM Fundamentals Guide*
- *Fabric Configuration Guide, Cisco DCNM for SAN*
- *High Availability and Redundancy Configuration Guide, Cisco DCNM for SAN*
- *Intelligent Storage Services Configuration Guide, Cisco DCNM for SAN*
- *Inter-VSAN Routing Configuration Guide, Cisco DCNM for SAN*
- *IP Services Configuration Guide, Cisco DCNM for SAN*
- *Quality of Service Configuration Guide, Cisco DCNM for SAN*
- *Security Configuration Guide, Cisco DCNM for SAN*
- *System Management Configuration Guide, Cisco DCNM for SAN*

Command-Line Interface

- *Cisco MDS 9000 Family Command Reference*

Intelligent Storage Networking Services Configuration Guides

- *Cisco MDS 9000 I/O Acceleration Configuration Guide*
- *Cisco MDS 9000 Family SANTap Deployment Guide*
- *Cisco MDS 9000 Family Data Mobility Manager Configuration Guide*
- *Cisco MDS 9000 Family Storage Media Encryption Configuration Guide*
- *Cisco MDS 9000 Family Cookbook for Cisco MDS SAN-OS*

Troubleshooting and Reference

- *Cisco NX-OS System Messages Reference*
- *Cisco MDS 9000 Family NX-OS Troubleshooting Guide*
- *Cisco MDS 9000 Family NX-OS MIB Quick Reference*



Cisco MDS 9250i Multiservice Fabric Switch Overview

This chapter describes the Cisco MDS 9250i Multiservice Fabric Switch and includes these topics:

- [Introduction, page 1-1](#)
- [Chassis Description, page 1-2](#)
- [Cisco MDS 9250i Integrated Supervisor Module, page 1-3](#)
- [Fan Modules, page 1-5](#)
- [Power Supplies, page 1-6](#)
- [Supported Transceivers, page 1-7](#)

Introduction

The Cisco MDS 9250i Multiservice Fabric Switch (DS-C9250I-K9) is an optimized platform for deploying high-performance SAN extension solutions, distributed intelligent fabric services, and cost-effective multiprotocol connectivity for both open systems and mainframe environments.

The Cisco MDS 9250i switch is an ideal solution for local office and remote branch-office SANs and also in large-scale SANs operating the Cisco MDS 9700 and 9500 Series Multilayer director platforms.

The Cisco MDS 9250i switch offers 40 autosensing 2-, 4-, 8-, and 16-Gbps line-rate Fibre Channel ports, eight 10-Gigabit Ethernet Fibre Channel over Ethernet (FCoE) ports, and two 10-Gigabit Ethernet IP storage services ports in a fixed two-rack-unit (2RU) form factor.

The Cisco MDS 9250i switch can be deployed in the existing native Fibre Channel networks, which ensures protection of your investments in storage networks. Two 1- and 10-gigabit ports support Small Computer System Interface over IP (iSCSI) storage services. By using the eight 10 Gigabit Ethernet FCoE ports, the Cisco MDS 9250i switch can be attached to the directly connected FCoE and Fibre Channel storage devices. The Cisco MDS 9250i switch supports multi-tiered unified network fabric connectivity directly over FCoE. The Cisco MDS 9250i switch has front-to-back airflow and comes with a set of storage services for Fibre Channel and FCoE SANs with FCIP, IO accelerator (IOA), and data mobility migration (DMM).

The Cisco SAN Extension over IP application package license is enabled as standard on the two fixed 1/10 Gigabit Ethernet IP storage services ports, enabling features such as Fibre Channel over IP (FCIP) and compression on the switch without additional licenses.

The Cisco MDS 9250i switch is shipped with the following:

- Hot-swappable, 2+1 redundant power supplies
- Hot-swappable, 1+1 redundant fan tray with integrated temperature and power management
- Hot-swappable SFP+ optics

Figure 1-1 Cisco MDS 9250i Switch Front View

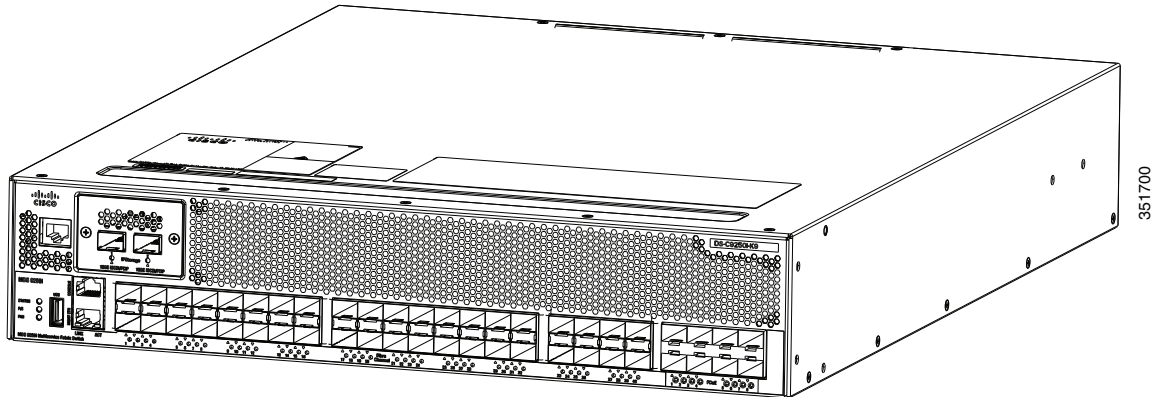
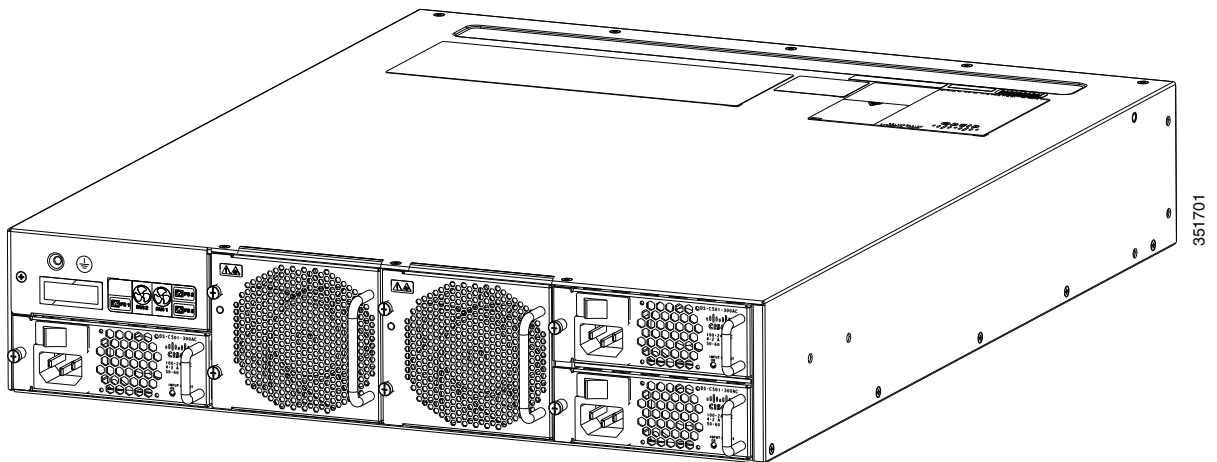


Figure 1-2 Cisco MDS 9250i Switch Rear View



Chassis Description

The Cisco MDS 9250i switch has a nonremovable supervisor module with 40 integrated 16-Gbps FC ports and eight 10-Gigabit Ethernet Fibre Channel over Ethernet (FCoE) ports.

The Cisco MDS 9250i switch also has these additional modules:

- 2-port 1- and 10-gigabit Ethernet IP storage services module

- USB port on the front panel for code uploads, configuration file backups, log dumps, and report capture
- A nonremovable interface module (located on the left side of the integrated supervisor module), which provides one RS-232 console port and one MGMT 10/100 Ethernet port for the integrated supervisor module
- Three power supplies that are redundant by default
- Two hot-swappable fans that are redundant by default

Cisco MDS 9250i Integrated Supervisor Module

The nonremovable Cisco MDS 9250i integrated supervisor module provides the control and management functions of the Cisco MDS 9250i Multiservice Fabric switch, and it includes 40 integrated 16-Gbps Fibre Channel switching ports and eight 10-Gigabit Ethernet Fibre Channel over Ethernet (FCoE) port modules.

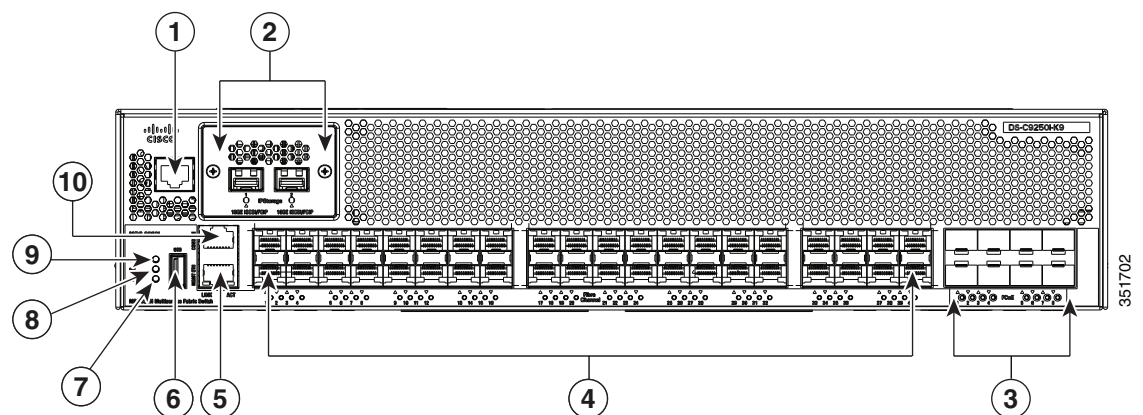
The Cisco MDS 9250i integrated supervisor module has a PowerPC 8572E processor. It also has an internal CompactFlash card that provides 4 GB of storage for software images. The NVRAM consists of a battery, a battery controller and 512 Kx16 SRAM. SRAM used to store event logs, core dumps that are required to be stored after a power cycles.

Front Panel LEDs

The front panel of the Cisco MDS 9250i switch has the following LEDs:

- Status LED
- P/S LED
- FAN LED

Figure 1-3 Cisco MDS 9250i Ports and LEDs



1	CONSOLE Debug Port	6	USB Port
2	10G iSCSI/FC Ports	7	STATUS LED

3	FCoE Ports	8	P/S LED
4	Fibre Channel Ports	9	FAN LED
5	MGMT ETH Port	10	CONSOLE Port

The LEDs on the supervisor module indicate the status of the supervisor module, power supplies, and the system as a whole. [Table 1-1](#) describes the LEDs.

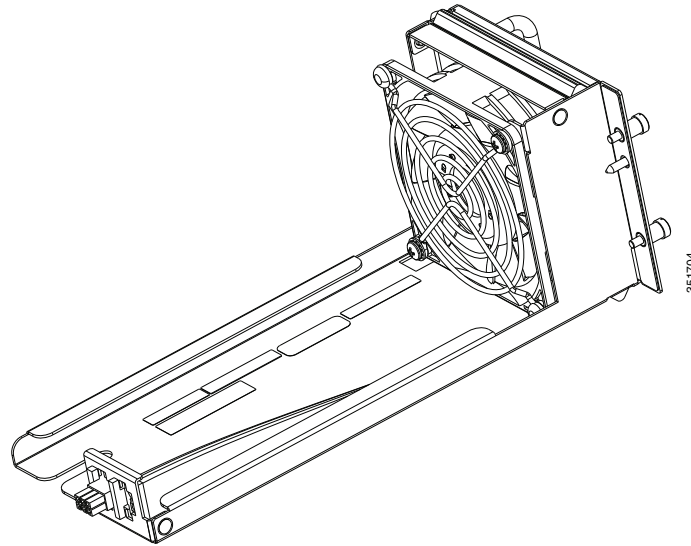
Table 1-1 Cisco MDS 9250i Switch Front Panel LEDs

LED	Status	Description
STATUS	Green	All diagnostics pass. The module is operational (normal initialization sequence).
	Orange	The module is booting or running diagnostics (normal initialization sequence) An over-temperature condition has occurred. (A minor temperature threshold has been exceeded during environmental monitoring.)
	Red blinking	One of the following occurred: <ul style="list-style-type: none"> The diagnostic test failed. The module is not operational because a fault occurred during the initialization sequence. An over-temperature condition has occurred. (A major temperature threshold has been exceeded during environmental monitoring.)
P/S	Red	The power is on, but it did not boot up the Diag or iSAN image.
	Green	Power supply is OK.
	Red	Power supply failed.
FAN	Off	The module is not receiving power.
	Green	Power supply is OK.
	Red	Power supply failed.
LINK	Off	The FAN module is not receiving power.
	Red	The Ethernet port is connected to a device.
	Off	The Ethernet port is not connected to a device.
ACT	Orange blinking	Data is being transmitted through this interface.
	Off	Not data is being transmitted.
1-48	Green	The link is up.
	Green blinking	The link is up and traffic is passing through the port.
	Off	The port has been shut down.

Fan Modules

The Cisco MDS 9250i switch has two fan trays that are installed vertically at the back of the chassis. Each fan module can be removed while the other fan module continues to move air through the chassis.

Figure 1-4 Cisco MDS 9250i Fan Module



One fan can fail without affecting the thermal performance of the system. Redundant fan controllers and other internal mechanisms are in place to ensure that any single fan tray does not go down.

If any single fan fails, the system continues to operate under all conditions. Two fan failures might cause alarms from ASIC when the temperature exceeds the threshold. At 104°F (40°C) or less, a single fan tray can be removed and the system can continue to operate long enough to allow for replacement of a failed fabric module or fan tray.

Power Supplies

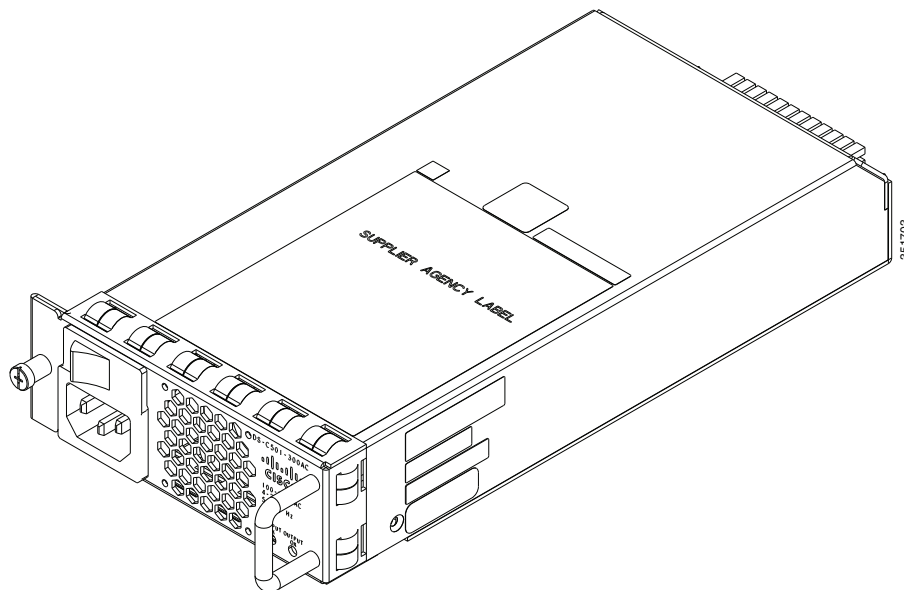
The Cisco MDS 9250i Multiservice Fabric switch supports the following types of power supplies:

- 300-W AC power supply (AC input and DC output)
- 300-W DC power supply (DC input and DC output)

The Cisco MDS 9250i Multiservice Fabric switch supports up to three hot-swappable 300-W AC power supplies (AC input) (DS-C50I-300AC).

When connected to 220 VAC, the 300-W AC power supplies (DS-C50I-300AC) for the Cisco MDS 9250i switch provide an output power of 300 W to power the modules and fans. When connected to a 110 VAC power system, the power supply provides approximately 300 W. In this case, and if the power supplies are used in redundant rather than combined mode, they might not provide adequate power, depending on the number of modules loaded in the chassis.

Figure 1-5 Cisco MDS 9250i Switch 300-W AC Power Supply



Each power supply module monitors its output voltage and provides the status to the supervisor. The power supply modules also provide information about local fans, power, shutdown control, and E2PROM to the supervisor.

Supported Transceivers

The Cisco MDS 9250i switch supports these transceivers: 1000BASE-T, RJ-45, 8-Gbps SW/LW, LC Enhanced Small Form-Factor Pluggable (SFP+), 10-Gbps SW/LW, LC SFP+, 10-GbE SR/LR/ER, LC, SFP+, and 16-Gbps SW/LW LC SFP+.

Fibre Channel SFP+ Transceivers

The Fibre Channel SFP+ transceivers are field-replaceable and hot-swappable. You can use any combination of SFP+ transceivers that are supported by the switch. The only restrictions are that SWL transceivers must be paired with SWL transceivers, and LWL transceivers must be paired with LWL transceivers, and the cable must not exceed the stipulated cable length for reliable communications.

For more information about a specific Cisco SFP+ transceiver, see the [“SFP+ Transceiver Specifications” section on page B-4](#). SFP+ transceivers can be ordered separately or with the Cisco MDS 9250i switch.

**Note**

Use only Cisco transceivers in the Cisco MDS 9250i switch. Each Cisco transceiver is encoded with model information that enables the switch to verify that the transceiver meets the requirements for the switch.



Installing the Cisco MDS 9250i Switch

This chapter describes how to install the Cisco MDS 9250i switch and its components and includes the following information:

- [Preparing for Installation, page 2-2](#)
- [Installing the Cisco MDS 9250i Switch Chassis in a Rack, page 2-5](#)
- [System Grounding, page 2-11](#)
- [Starting Up the Switch, page 2-14](#)
- [Removing and Installing a Power Supply, page 2-16](#)
- [Removing and Installing Fan Modules, page 2-18](#)



Note

Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family* for important safety information.



Warning

IMPORTANT SAFETY INSTRUCTIONS

This warning symbol indicates danger. You are in a situation that could cause physical 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.
Statement 1071

SAVE THESE INSTRUCTIONS



Warning

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.
Statement 1017



Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
Statement 1030

**Warning**

A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022

Preparing for Installation

This section provides the following topics:

- [Unpacking and Inspecting the Switch, page 2-2](#)
- [Required Equipment, page 2-3](#)
- [Installation Options, page 2-4](#)
- [Installation Guidelines, page 2-4](#)

Unpacking and Inspecting the Switch

**Warning**

Two people are required to lift the chassis. Grasp the chassis underneath the lower edge and lift with both hands. To prevent injury, keep your back straight and lift with your legs, not your back. To prevent damage to the chassis and components, never attempt to lift the chassis with the handles on the power supplies or on the interface processors, or by the plastic panels on the front of the chassis. These handles were not designed to support the weight of the chassis. Statement 5

**Caution**

When handling switch components, wear an ESD strap and handle modules by the carrier edges only. An ESD socket is provided on the chassis. For the ESD socket to be effective, the chassis must be grounded either through the power cable, the chassis ground, or metal-to-metal contact with a grounded rack.

**Tip**

Keep the shipping container for use when moving or shipping the chassis in the future. The shipping carton can be flattened and stored with the pallet.

**Note**

If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco Systems, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

**Note**

The switch is thoroughly inspected before shipment. If any damage occurred during transportation or any items are missing, contact your customer service representative immediately.

To inspect the shipment, follow these steps:

-
- Step 1** Compare the shipment to the equipment list provided by your customer service representative and ensure that you have received all items, including the following:
- Grounding lug kit
 - Mounting kit
 - ESD wrist strap
 - Cables and connectors
 - Any optional items ordered
- Step 2** Check for damage and report any discrepancies or damage to your customer service representative. Keep the following information ready:
- Invoice number of shipper (see packing slip)
 - Model and serial number of the damaged unit
 - Description of damage
 - Effect of damage on the installation
-

Required Equipment

Before beginning the installation, you need to obtain the following items:

- Number 1 and number 2 Phillips screwdrivers with torque capability.
- 3/16-inch flat-blade screwdriver.
- Tape measure and level.
- ESD wrist strap or other grounding device.
- Antistatic mat or antistatic foam.
- In addition to the grounding items provided in the accessory kit, you need the following items:
 - Grounding cable (6 AWG recommended), sized according to local and national installation requirements; the required length depends on the proximity of the Cisco MDS 9250i switch to proper grounding facilities.
 - Crimping tool large enough to accommodate girth of lug.
 - Wire-stripping tool.

Installation Options

The Cisco MDS 9250i switch can be installed using the following methods:

- In an open EIA rack, using:
 - The rack-mount kit shipped with the switch
 - The Telco and EIA Shelf Bracket Kit (an optional kit, purchased separately) in addition to the rack-mount kit shipped with the switch
- In a perforated or solid-walled EIA cabinet, using:
 - The rack-mount kit shipped with the switch
 - The telco and EIA Shelf Bracket Kit (an optional kit, purchased separately) in addition to the rack-mount kit shipped with the switch
- In a two-post telco rack, using:
 - The rack-mount kit shipped with the switch
 - The Telco and EIA Shelf Bracket Kit (an optional kit, purchased separately)

For instructions on installing the switch using the mounting kit shipped with the switch, see the [“Installing the Cisco MDS 9250i Switch Chassis in a Rack”](#) section on page 2-5.

For instructions on installing the switch using the optional Telco and EIA Shelf Bracket Kit (purchased separately), see the [“Rack-Mounting Guidelines”](#) section on page A-2.

Installation Guidelines

Follow these guidelines when installing the Cisco MDS 9250i switch:

- Plan your site configuration and prepare the site before installing the chassis. Cisco recommends that you use the site planning tasks listed in [Appendix D, “Site Planning and Maintenance Records.”](#)
- Ensure that there is adequate space around the switch to allow for servicing the switch and for adequate airflow (airflow requirements are listed in [Appendix B, “Technical Specifications.”](#))
- Ensure that the air-conditioning meets the heat dissipation requirements listed in [Appendix B, “Technical Specifications.”](#)
- Ensure that the rack meets the requirements listed in [Appendix A, “Rack Requirements.”](#)
- Ensure that the site power meets the power requirements listed in [Appendix B, “Technical Specifications.”](#) You can use an uninterruptible power supply (UPS) to protect against power failures.



Caution Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as the Cisco MDS 9000 Family, which can have substantial current draw fluctuations because of fluctuating data traffic patterns.

- Ensure that circuits are sized according to local and national codes. For North America:
 - The 300-W AC power supplies require a 20-A circuit.

If you are using 200/240 VAC power sources in North America, the circuits must be protected by two-pole circuit breakers. The Telco and EIA Shelf Bracket Kit (an optional kit, purchased separately) in addition to the rack-mount kit shipped with the switch.

**Caution**

To prevent loss of input power, ensure that the total maximum loads on the circuits supplying power are within the current ratings of the wiring and breakers.

- Record your installation and configuration information as you work. See [Appendix D, “Site Planning and Maintenance Records.”](#)
- Use the following screw torques when installing the switch:
 - Captive screws: 4 in-lb
 - M3 screws: 4 in-lb
 - M4 screws: 12 in-lb
 - 10- 32 screws 20 in-lb
 - 12-24 screws: 30 in-lb

Installing the Cisco MDS 9250i Switch Chassis in a Rack

This section describes how to install the Cisco MDS 9250i switch in a rack that meets the requirements described in this document, using the mounting kit provided with the switch.

**Caution**

If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

**Caution**

If connecting a Cisco MDS 9250i switch to a 110-VAC power system, ensure that sufficient power is provided to meet the chassis power requirements for the number of modules installed.

**Warning**

When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046

**Caution**

All power supplies must be grounded. The receptacles of the AC power cables used to provide power to the chassis must be the grounding type, and the grounding conductors should connect to protective earth ground at the service equipment. For a Cisco MDS 9250i switch with a DC power supply, a grounding cable must be connected to the terminal block.

If a 110-VAC input is chosen, a 110-VAC power cord (CAB-7513AC=) must be ordered separately.

[Table 2-1](#) lists the items provided in the Cisco MDS 9250i mounting kit used for installing the switch.

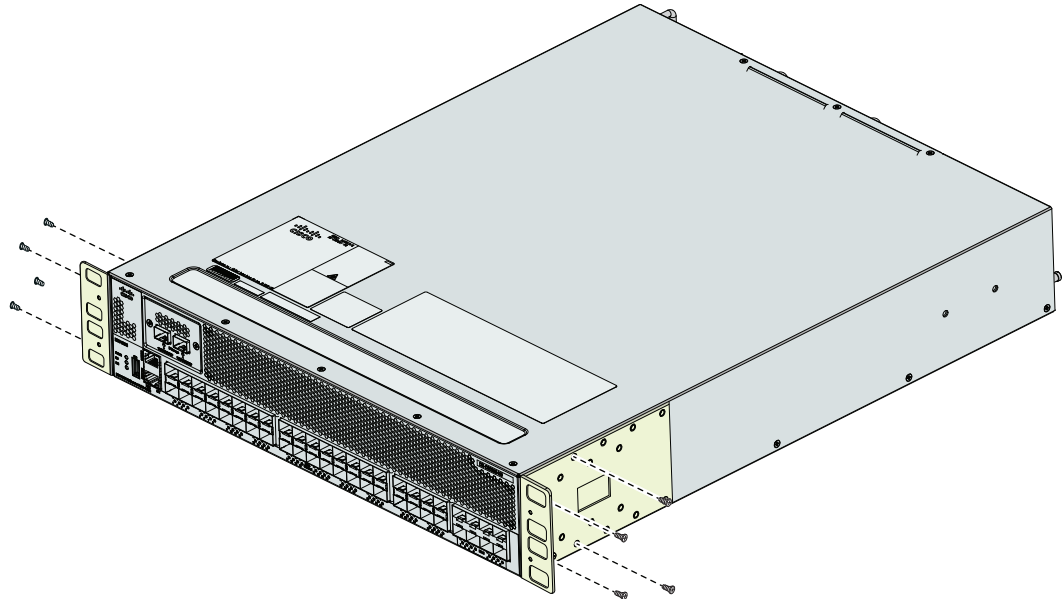
Table 2-1 Cisco MDS 9250i Fabric Switch Rack-Mount Kit

Description	Quantity
Front Rack-Mount Bracket Kit	
Front rack-mount brackets	2 per kit
M4 X 6-mm Phillips flat-head screws	8 per kit
12-24 X 3/4-inch Phillips binder-head screws	8 per kit
10-32 x 3/4-inch Phillips binder-head screws	8 per kit
Cable Management Bracket Kit	
Cable guide	2 per kit
M4 X 6-mm Phillips pan-head screws	2 per kit
Rear Rack-Mount Bracket Kit	
30- to 36-inch slider rails	2 per kit
24- to 30-inch slider rails	2 per kit
18- to 24-inch slider rails	2 per kit
12-24 X 3/4-inch Phillips binder-head screws	8 per kit
10-32 X 3/4-inch Phillips binder-head screws	8 per kit
C brackets	2 per kit
M3 X 6-mm, Phillips flat-head screws	4 per kit
12-24 cage nuts	16 per kit

To install the Cisco MDS 9250i chassis in a rack using the mounting kit provided with the switch, follow these steps:

- Step 1** Install the front rack-mount bracket as follows:
- Position one of the front rack-mount brackets against the side of the switch and align the screw holes as shown in [Figure 2-1](#).

Figure 2-1 *Installing the Rack-Mount Brackets on the Cisco MDS 9250i Multiservice Switch*

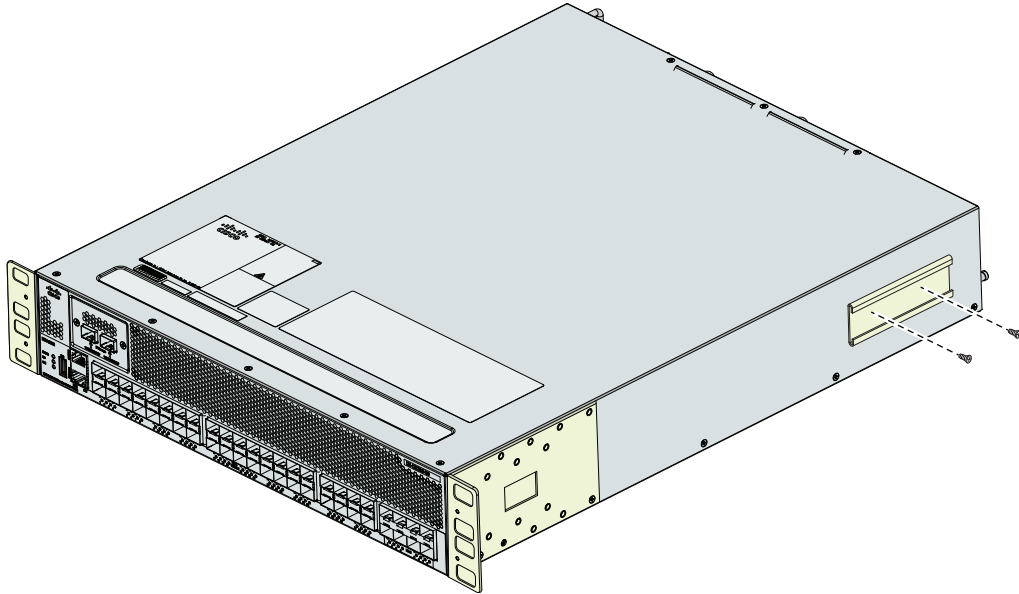


- Attach the bracket to the switch with the four M4 screws originally provided with the bracket.
- Repeat with the other front rack-mount bracket on the other side of the switch.

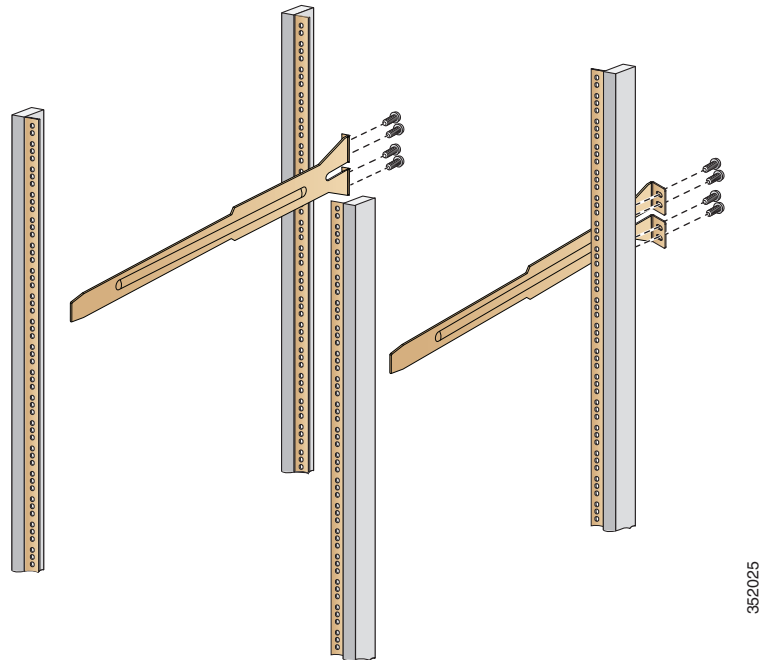
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- Step 2** Install the C brackets as follows:
- Position one of the C brackets against the side of the switch and align the screw holes as shown in [Figure 2-2](#).

Figure 2-2 *Installing C Brackets on the Cisco MDS 9250i Multiservice Switch*



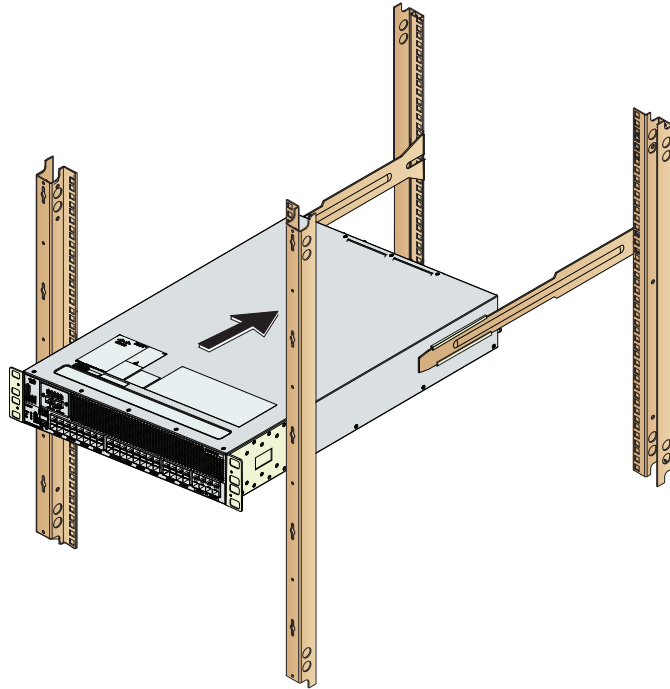
- Attach the bracket to the switch with the two M3 screws originally provided with the bracket.
 - Repeat with the other C bracket on the other side of the switch.
- Step 3** Install the slider rails in the rack. Position one of the slider rails against the rack mounting rails and align the screw holes as shown in [Figure 2-3](#).

Figure 2-3 *Installing the Slider Rails*

- Step 4** Attach the slider rail using four 12-24 screws or four 10-32 screws, depending on the rack rail thread type. For racks with square holes, insert the 12-24 cage nuts in position behind the mounting holes in the slider rails.
- Repeat with the other slider rail on the other side of the rack.
 - Use the tape measure and level to verify that the rails are horizontal and at the same height.

- Step 5** Insert the switch into the rack:
- By using both hands, position the switch with the back of the switch between the front rack-mounting rails as shown in [Figure 2-4](#).

Figure 2-4 Installing the Slider Rails

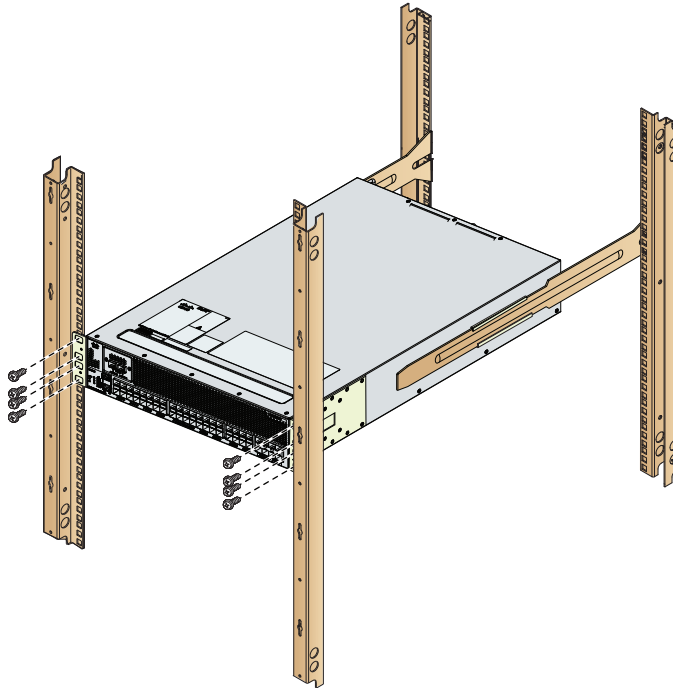


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- Align the two C brackets on either side of the switch with the slider rails installed in the rack. Slide the C brackets onto the slider rails, and then gently slide the switch all the way into the rack. If the switch does not slide easily, try realigning the C brackets on the slider rails.

- Step 6** Stabilize the switch in the rack by attaching the front rack-mount brackets to the front rack-mounting rails:
- a. Insert four screws (12-24 or 10-32, depending on rack type) and through the cage nuts and the holes in one of the front rack-mount brackets and into the threaded holes in the rack-mounting rail as shown in [Figure 2-5](#).

Figure 2-5 Attaching Front Rack-Mount Brackets



- b. Repeat for the front rack-mount bracket on the other side of the switch.

If you are installing the optional cable guides, place the cable guides in front of the front rack-mount brackets, and then pass the screws through the cable guides, front rack-mount brackets, and mounting rail. You can install one or both cable guides; if installing a single cable guide, it can be installed on either side.

System Grounding

This section describes the need for system grounding and explains how to prevent damage from electrostatic discharge.



Note

In all situations, grounding practices must comply with local National Electric Code (NEC) requirements or local laws and regulations.



Note

Always ensure that all of the modules are completely installed and that the captive installation screws are fully tightened. In addition, ensure that all I/O cables and power cords are properly seated. These practices are normal installation practices and must be followed in all installations.

**Note**

This system ground is also referred to as the network equipment building system (NEBS) ground.

- If your chassis does not have the system ground attached, you must install the system ground lug. For installation instructions and location of the chassis system ground pads, see [“Establishing the System Ground”](#) section on page 2-13.

**Note**

You do not need to attach a supplemental system ground wire to the system ground lug; the lug provides a direct path to the bare metal of the chassis.

After you install the system ground lug, follow these steps to correctly attach the ESD wrist strap:

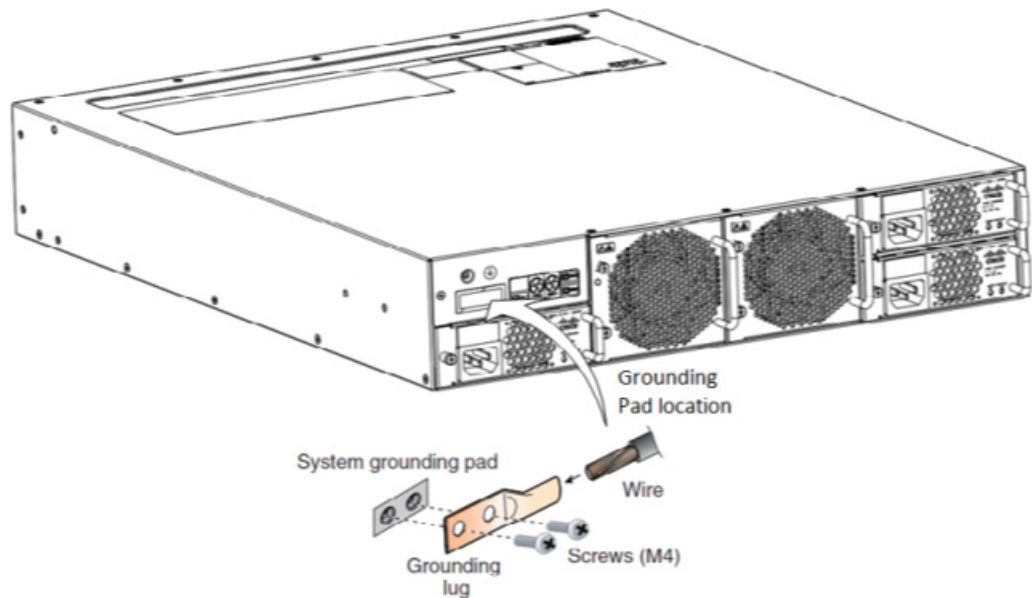
-
- Step 1** Attach the ESD wrist strap to bare skin as follows:
- c.** If you are using the ESD wrist strap supplied with the FRUs, open the wrist strap package and unwrap the ESD wrist strap. Place the black conductive loop over your wrist and tighten the strap so that it makes good contact with your bare skin.
 - d.** If you are using an ESD wrist strap equipped with an alligator clip, open the package and remove the ESD wrist strap. Locate the end of the wrist strap that attaches to your body and secure it to your bare skin.
- Step 2** Grasp the spring or alligator clip on the ESD wrist strap and momentarily touch the clip to a bare metal spot (unpainted surface) on the rack. We recommend that you touch the clip to an unpainted rack rail so that any built-up static charge is then safely dissipated to the entire rack.
- Step 3** Plug the strap into the port (and alternatively clip an alligator clip onto the grounding lug screws) by attaching either the spring clip or the alligator clip to the ground lug screw as shown in [Figure 2-6](#).
- a.** If you are using the ESD wrist strap that is supplied with the FRUs, squeeze the spring clip jaws open, position the spring clip to one side of the system ground lug screw head, and slide the spring clip over the lug screw head so that the spring clip jaws close behind the lug screw head.

**Note**

The spring clip jaws do not open wide enough to fit directly over the head of the lug screw or the lug barrel.

- b.** If you are using an ESD wrist strap that is equipped with an alligator clip, attach the alligator clip directly over the head of the system ground lug screw or to the system ground lug barrel.

Figure 2-6 Attaching the ESD Wrist Strap to the System Ground Lug Screw



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- c. Follow these additional guidelines when handling modules:
- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.
 - Place a removed component board-side-up on an antistatic surface or in a static shielding container. If you plan to return the component to the factory, immediately place it in a static shielding container.
 - Never attempt to remove the printed circuit board from the metal carrier.



Caution

For safety reasons, check the resistance value of the antistatic strap periodically. The measurement should be between 1 and 10 megohm (Mohm).

Establishing the System Ground

This section describes how to connect a system ground to the Cisco MDS 9250i switch.



Note

This system ground is also referred to as the network equipment building system (NEBS) ground.

You must use the system (NEBS) ground on both AC- and DC-powered systems if you are installing this equipment in a U.S. or European Central Office.

The system (NEBS) ground provides additional grounding for EMI shielding requirements and grounding for the low-voltage supplies (DC-DC converters) on the modules and is intended to satisfy the Telcordia Technologies NEBS requirements for supplemental bonding and grounding connections. You must observe the following system grounding guidelines for your chassis:

- You must install the system (NEBS) ground connection with any other rack or system power ground connections that you make. The system ground connection is required if this equipment is installed in a U.S. or European Central Office.
- You must connect both the system (NEBS) ground connection and the power supply ground connection to an earth ground. The system (NEBS) ground connection is required if this equipment is installed in a U.S. or European Central Office.

**Note**

The system (NEBS) ground serves as the primary safety ground for the MDS 9250i chassis that are equipped with DC-input PEMs. The DC-input power supplies for these chassis do not have a separate ground.

Required Tools and Equipment

To connect the ground system, you need the following tools and materials:

- Grounding lug—A two-hole standard barrel lug. Supports up to 6 AWG wire. Supplied as part of accessory kit.
- Grounding screws—Two M4 x 8mm (metric) pan-head screws. Supplied as part of the accessory kit.
- Grounding wire—Not supplied as part of accessory kit. The grounding wire should be sized according to local and national installation requirements. Depending on the power supply and system, a 12 AWG to 6 AWG copper conductor is required for U.S. installations. Commercially available 6 AWG wire is recommended. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.
- No. 1 Phillips screwdriver.
- Crimping tool to crimp the grounding wire to the grounding lug.
- Wire-stripping tool to remove the insulation from the grounding wire.

Starting Up the Switch

This section provides the following information:

- [Connecting the Power Supplies, page 2-15](#)
- [Powering Up the Switch and Verifying Component Installation, page 2-15](#)

**Warning**


Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing. Statement 1034

**Caution**

During this procedure, wear grounding wrist straps to avoid ESD damage to the switch.

Connecting the Power Supplies

To provide power to an AC power supply in a Cisco MDS 9250i switch, follow these steps:

-
- Step 1** Verify that the power switches on all power supplies are off.
- Step 2** Plug the power cable into the power supply and tighten the screw on the power cable retainer to ensure that the cable cannot be pulled out.
- Step 3** Verify that both power supplies and fan modules are installed and tighten any loose captive screws.
-
-  **Note** Depending on the outlet receptacle on your power distribution unit, you may need the optional jumper power cord to connect the Cisco MDS 9250i switch to your outlet receptacle.
-
- Step 4** Connect the other end of the power cable to a power source.
- Step 5** Ensure that the switch is adequately grounded and that the power cables are connected to outlets that have the required AC power voltages.
-

Powering Up the Switch and Verifying Component Installation



Note Do not connect the MGMT 10/100 Ethernet port to the LAN until the initial switch configuration has been performed. For instructions on configuring the switch, see the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

For instructions on connecting to the console port, see the [“Connecting to the Console Port”](#) section on page 3-2.

To power up the switch and verify hardware operation, follow these steps:

-
- Step 1** Power on the switch by turning the power switches on the power supplies or PEMs to the on (I) position. The switch boots automatically.
- Step 2** Listen for the fans; they should begin operating as soon as the switch is powered on.



Caution Do not operate the switch without a functioning fan module except during the brief fan module replacement procedure. The Cisco MDS 9000 Family switches can operate for only a few minutes without a functioning fan module before they begin to overheat.

- Step 3** Verify that the LED behavior is as follows when the switch has finished booting:
- Fan status LED is green.
 - Each P/S LED is green.
 - The Switch STATUS LED is green. If this LED is orange or red, then one or more environmental monitors is reporting a problem.
 - The Ethernet port Link LEDs should not be on unless the cable is connected.



Note The LEDs for the Fibre Channel ports remain orange until the ports are enabled, and the LED for the MGMT 10/100 Ethernet port remains off until the port is connected.

If any LEDs other than the Fibre Channel port LEDs remain orange or red after the initial boot processes are complete, see [Appendix B, “Technical Specifications.”](#)

- Step 4** If a component is not operating correctly, try removing and reinstalling it. If it still does not operate correctly, contact your customer service representative for a replacement.



Note If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco Systems, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html.

- Step 5** Verify that the system software has booted and the switch has initialized without error messages. If any problems occur, see the *Cisco MDS 9000 Family System Messages Reference*. If you cannot resolve an issue, contact your customer service representative.

- Step 6** Complete the worksheets provided in [Appendix D, “Site Planning and Maintenance Records,”](#) for future reference.



Note A setup utility automatically launches the first time you access the switch and guides you through the basic configuration. For instructions about how to configure the switch and check module connectivity, see the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide* or the *Cisco Fundamentals Configuration Guide for DCNM SAN*.

Removing and Installing a Power Supply

This section provides the following information:

- [Removing an AC Power Supply from the Cisco MDS 9250i Switch, page 2-17](#)
- [Installing an AC Power Supply in the Cisco MDS 9250i Switch, page 2-17](#)

A flat-blade or number 2 Phillips-head screwdriver is required to perform these procedures.



Warning

Voltage is present on the backplane when the system is operating. To reduce risk of an electric shock, keep hands and fingers out of the power supply bays and backplane areas. Statement 166

**Warning**

Power supply captive installation screws must be tight to ensure protective grounding continuity. Statement 289

Removing an AC Power Supply from the Cisco MDS 9250i Switch

**Warning**

Voltage is present on the backplane when the system is operating. To reduce risk of an electric shock, keep hands and fingers out of the power supply bays and backplane areas. Statement 166

To remove an AC power supply from the Cisco MDS 9250i switch, follow these steps:

- Step 1** Turn the power switch on the power supply to the off (0) position.
- Step 2** Disconnect the power cable from the power source.
- Step 3** Remove the cable retention device and disconnect the power cable from the power supply being removed.
- Step 4** Grasp the power supply handle with one hand, and slide the power supply partially out of the chassis. Place your other hand underneath the power supply, and slide the power supply completely out of the chassis.
- Step 5** If the power supply bay is to remain empty, install a power supply filler panel over the opening, and tighten the captive screw to 8 in-lb.

Installing an AC Power Supply in the Cisco MDS 9250i Switch

To install an AC power supply in the Cisco MDS 9250i switch, follow these steps:

- Step 1** Ensure that the system (earth) ground connection has been made. See the [“System Grounding” section on page 2-11](#).
- Step 2** If a filler panel is installed, remove the filler panel from the power supply bay by loosening the captive screw.
- Step 3** Ensure that the power switch is in the off (0) position on the power supply you are installing.
- Step 4** Grasp the power supply handle with one hand, place your other hand underneath the power supply, and slide the power supply into the power supply bay. Ensure that the power supply is fully seated in the bay.
- Step 5** Plug the power cable into the power supply, and place the cable retention device to ensure that the cable cannot be pulled out.
- Step 6** Connect the other end of the power cable to an AC power source.
- Step 7** Turn the power switch to the on (I) position on the power supply. Turning the power switch on also locks the power supply in the bay.
- Step 8** Verify power supply operation by checking that the power supply LEDs are in the following states:
 - INPUT OK LED is green.

- OUTPUT OK LED is green.
-

Removing and Installing Fan Modules

The fan module is designed to be removed and replaced while the system is operating without presenting an electrical hazard or damage to the system, provided the replacement is performed promptly.

The Cisco MDS 9250i switch has two fan modules with the abrupt stop-to-fan rotation safety feature after power is disconnected or the fan tray is removed from the chassis.



Caution

The Cisco MDS 9000 Family switches have internal temperature sensors that can shut down the system if the temperature at different points within the chassis exceed certain safety thresholds. To be effective, the temperature sensors require the presence of airflow; therefore, if both the fan modules are removed from the MDS 9250i chassis, the switch shuts down after five minutes to prevent potentially undetectable overheating. However, the switches will shut down sooner if the higher-level temperature threshold is exceeded.

This section includes the following topics:

- [Removing a Fan Module on the Cisco MDS 9250i Switch, page 2-18](#)
- [Installing a Fan Module on the Cisco MDS 9250i Switch, page 2-18](#)

Removing a Fan Module on the Cisco MDS 9250i Switch

To remove the fan module from the Cisco MDS 9250i switch, follow these steps:

-
- Step 1** Loosen the four captive screws on the module being removed.
 - Step 2** Grasp the fan module with both hands and pull it outward to unseat the power connector from the backplane.
 - Step 3** Pull the fan module clear of the chassis.



Warning

When removing the fan tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you remove the fan tray. Statement 258

Installing a Fan Module on the Cisco MDS 9250i Switch

To install a fan module on the Cisco MDS 9250i switch, follow these steps:

-
- Step 1** Place the fan module into the rear chassis cavity so it rests on the chassis. Lift the fan module up slightly to align the top and bottom chassis guides, then push the fan module into the chassis until it seats in the backplane and the captive screws make contact with the chassis. The fan module just snaps in.
- Step 2** If the switch is powered on, listen for the fans; you should immediately hear them operating. If you do not hear them, ensure that the fan module is inserted completely in the chassis and the outside surface of the fan module is flush with the outside surface of the chassis.
- Step 3** Verify that the Fan STATUS LED is green. If the LED is not green, one or more fans are faulty. If this occurs, contact your customer service representative for a replacement part.



Note If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco Systems, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html.



Connecting the Cisco MDS 9250i Switch

This chapter describes how to connect the Cisco MDS 9250i switch and includes these topics:

- [Connection Guidelines, page 3-1](#)
- [Preparing for Network Connections, page 3-2](#)
- [Connecting to the Console Port, page 3-2](#)
- [Connecting to the MGMT 10/100/1000 Ethernet Port, page 3-3](#)
- [Connecting to a Fibre Channel Port, page 3-3](#)

Connection Guidelines

The Cisco MDS 9250i switch provides the following types of ports:

- Console port—An RS-232 port is used to create a local management connection.
- MGMT 10/100/1000 Ethernet port—An Ethernet port is used to access and manage the switch by IP address, such as through Cisco Data Center Network Manager (DCNM).
- Fibre Channel ports —Fibre Channel ports that are used to connect to the SAN or for in-band management. The FC ports on Cisco MDS 9250i switch support the IBM (FICON) connectivity.
- Fibre Channel over Ethernet— FCoE ports that are used for FCoE connectivity. The FCoE ports of the Cisco MDS 9250i switch cannot be used for traditional Ethernet switching.
- IP Storage ports—IP Storage Services ports that are used for the FCIP or iSCSI connectivity.
- USB drive—A simple interface that allows you to connect to different devices supported by Cisco MDS NX-OS.

This chapter includes the following sections:

- [Preparing for Network Connections, page 3-2](#)
- [Connecting to the Console Port, page 3-2](#)
- [Connecting to the MGMT 10/100/1000 Ethernet Port, page 3-3](#)
- [Connecting to a Fibre Channel Port, page 3-3](#)

**Caution**

When running power and data cables in overhead or subfloor cable trays, we strongly recommend that power cables and other potential noise sources be located as far away as is practical from network cabling that terminates on Cisco equipment. In situations where long parallel cable runs cannot be separated by at least 3.3 ft (1 m), we recommend shielding any potential noise sources by housing them in a grounded metallic conduit.

Preparing for Network Connections

When preparing your site for network connections to the Cisco MDS 9250i switch, consider the following for each type of interface, and obtain all of the required equipment before connecting the ports:

- Cabling required for each interface type
- Distance limitations for each signal type
- Additional interface equipment required

Connecting to the Console Port

The console port, labeled “Console,” is an RS-232 port with an RJ-45 interface. It is an asynchronous (async) serial port; any device connected to this port must be capable of asynchronous transmission.

We recommend that you use this port to create a local management connection to set the IP address and other initial configuration settings before connecting the switch to the network for the first time.

**Caution**

If you decide to connect the console port to a modem, do not connect it while the switch is booting; connect either before powering the switch on or after the switch has completed the boot process.

You can use the console port to perform the following functions:

- Configure the Cisco MDS 9250i switch from the CLI.
- Monitor network statistics and errors.
- Configure SNMP agent parameters.
- Download software updates.

**Note**

To connect the console port to a computer terminal, the computer must support VT100 terminal emulation. The terminal emulation software—frequently an application such as HyperTerminal or Procomm Plus—makes communication between the switch and computer possible during setup and configuration.

To connect the console port to a computer terminal, follow these steps:

Step 1 Configure the terminal emulator program to match the following default port characteristics:

- 9600 baud
- 8 data bits
- 1 stop bit

- No parity
- Step 2** Connect the supplied RJ-45 to DP-25 female adapter. We recommend that you use the adapter and cable provided with the switch.
- Step 3** Connect the console cable (a rollover RJ-45 to RJ-45 cable) to the console port or the RJ-45 to DP-25 adapter (depending on your computer) at the computer serial port.
-

Connecting to the MGMT 10/100/1000 Ethernet Port

The autosensing 10/100/1000 Ethernet management port is located on the front panel (labeled MGMT ETH), below the Console port. This port is used for out-of-band management of the Cisco MDS 9250i switch.



Caution

To prevent an IP address conflict, do not connect the MGMT 10/100/1000 Ethernet port to the network until the initial configuration is complete. For more information, see the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

To connect the MGMT 10/100/1000 Ethernet port to an external hub, switch, or router, follow these steps:

- Step 1** Connect the appropriate modular cable to the MGMT 10/100/1000 Ethernet port:
- Use a modular, RJ-45, straight-through UTP cable to connect the MGMT 10/100/1000 Ethernet port to an Ethernet switch port or hub.
 - Use a cross-over cable to connect to a router interface.
- Step 2** Connect the other end of the cable to the device.
-

Connecting to a Fibre Channel Port

The Fibre Channel ports are compatible with LC-type fiber-optic. You can use these ports to connect to the SAN or for in-band management. For information about configuring the switch for in-band management, see the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

The Cisco MDS 9000 Family supports both Fibre Channel and Gigabit Ethernet protocols for SFP+ transceivers. Each transceiver must match the transceiver on the other end of the cable, and the cable must not exceed the stipulated cable length for reliable communication. For information on how to get the list of supported SFP+ transceivers for your software release, see the *Cisco MDS 9000 Family Release Notes for Cisco MDS NX-OS*.



Warning

Class 1 laser product. Statement 1008

**Warning**

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051

**Caution**

Wear an ESD wrist strap connected to the chassis when handling transceivers. Keep optical connectors covered when not in use, and do not touch connector ends. The fiber-optic connectors must be free of dust, oil, and other contaminants.

This section provides the following topics:

- [Removing and Installing Cables into SFP+ Transceivers, page 3-7](#)
- [Maintaining SFP+ Transceivers and Fiber-Optic Cables, page 3-9](#)

Removing and Installing SFP+ Transceivers

**Caution**

Removing and installing an SFP+ transceiver can shorten its useful life. Do not remove and insert SFP+ transceivers more often than is absolutely necessary. We recommend disconnecting cables before installing or removing SFP+ transceivers to prevent damage to the cable or transceiver.

**Note**

Use only Cisco SFP+ transceivers on the Cisco MDS 9250i switch. Each Cisco SFP+ transceiver is encoded with model information that enables the switch to verify that the SFP+ transceiver meets the requirements for the switch. For instructions specific to the transceiver type, see the [“SFP+ Transceiver Specifications” section on page B-4](#).

The Cisco MDS 9000 Family supports SFP+ transceivers with the following two types of latching devices:

- Mylar tab latch ([Figure 3-1](#))
- Bale-clasp latch ([Figure 3-2](#))

Figure 3-1 SFP+ Transceiver with Mylar Tab Latch

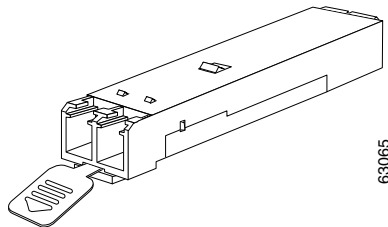
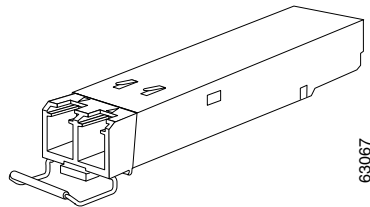


Figure 3-2 SFP+ Transceiver with Bale-Clasp Latch

Removing an SFP+ Transceiver

To remove an SFP+ transceiver, follow these steps:

-
- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.
- Step 2** If a cable is installed in the transceiver:
- Record the cable and port connections for later reference.
 - Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.
 - Insert a dust plug into the cable end of the transceiver.



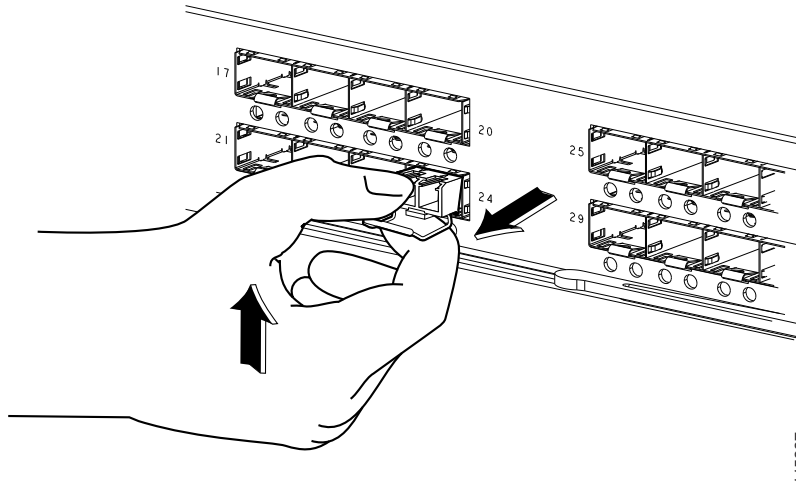
Caution If the transceiver does not remove easily in the next step, push the transceiver all the way back in and then ensure that the latch is in the correct position before continuing.

- Step 3** Remove the transceiver from the port:
- If the transceiver has a Mylar tab latch, gently pull the tab straight out (do not twist), and then pull the transceiver out of the port.
 - If the transceiver has a bale clasp latch, open the clasp by pressing it downwards, and then pull the transceiver out of the port.



Note If you have difficulty removing a bale clasp SFP+ transceiver, you should reseal the SFP+ by returning the bale clasp in the up position. Then press the SFP+ inward and upward into the cage. Next, lower the bale clasp and pull the SFP+ straight out with a slight upward lifting force (see [Figure 3-3](#)). Be careful not to damage the port cage during this process.

Figure 3-3 *Alternate Removal Method for Bale Clasp SFP+ Transceivers*



- Step 4** Insert a dust cover into the port end of the transceiver and place the transceiver on an antistatic mat or into a static shielding bag if you plan to return it to the factory.
- Step 5** If another transceiver is not being installed, protect the optical cage by inserting a clean cover.
-

Installing an SFP+ Transceiver

To install an SFP+ transceiver, follow these steps:

-
- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.
- Step 2** Remove the dust cover from the port cage.
- Step 3** Remove the dust cover from the port end of the transceiver.
- Step 4** Insert the transceiver into the port:
- If the transceiver has a Mylar tab, orient the transceiver with the tab on the bottom, and then gently insert the transceiver into the port until it clicks into place.
 - If the transceiver has a bale clasp, orient the transceiver with the clasp on the bottom, close the clasp by pushing it up over the transceiver, and then gently insert the transceiver into the port until it clicks into place.



Caution If the transceiver does not install easily, ensure that it is correctly oriented and the tab or clasp are in the correct position before continuing.



Note If you cannot install the cable into the transceiver, insert or leave the dust plug in the cable end of the transceiver.

Removing and Installing Cables into SFP+ Transceivers



Caution To prevent damage to the fiber-optic cables, do not place more tension on them than the rated limit and do not bend to a radius of less than 1 inch if there is no tension in the cable, or 2 inches if there is tension in the cable.

Removing a Cable from an SFP+ Transceiver



Caution When pulling a cable from a transceiver, grip the body of the connector. Do not pull on the jacket sleeve, because this can compromise the fiber-optic termination in the connector.



Caution If the cable does not remove easily, ensure that any latch present on the cable has been released before continuing.

To remove the cable, follow these steps:

-
- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.

- Step 2** Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.
- Step 3** Insert a dust plug into the cable end of the transceiver.
- Step 4** Insert a dust plug onto the end of the cable.

Installing a Cable into an SFP+ Transceiver



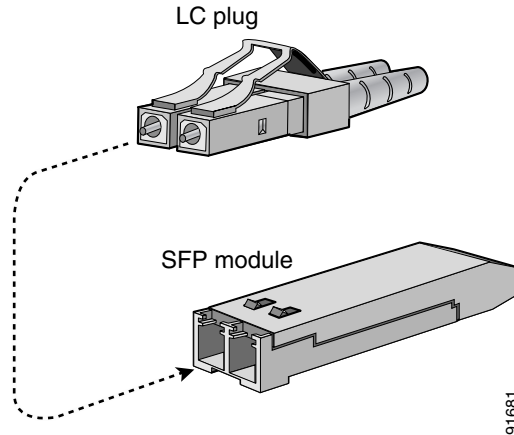
Caution

To prevent possible damage to the cable or transceiver, install the transceiver in the port before installing the cable in the transceiver.

To install a cable into a transceiver, follow these steps:

- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.
- Step 2** Remove the dust cover from the connector on the cable.
- Step 3** Remove the dust cover from the cable end of the transceiver.
- Step 4** Align the cable connector with the transceiver and insert the connector into the transceiver until it clicks into place (see [Figure 3-4](#)).

Figure 3-4 Connecting the LC-Type Cable to a Fibre Channel Port



Caution

If the cable does not install easily, ensure that it is correctly oriented before continuing.

For instructions on verifying connectivity, see the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

Maintaining SFP+ Transceivers and Fiber-Optic Cables

SFP+ transceivers and fiber-optic cables must be kept clean and dust-free to maintain high signal accuracy and prevent damage to the connectors. Attenuation (loss of light) is increased by contamination and should be below 0.35 dB.

Follow these maintenance guidelines:

- SFP+ transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventive wrist strap that is connected to the chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. If they become dusty, clean before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch ends of connectors to prevent fingerprints and other contamination.
- Clean regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedure.
- Inspect routinely for dust and damage. If damage is suspected, clean and then inspect fiber ends under a microscope to determine if damage has occurred.



Rack Installation

This appendix provides information on the rack installation and includes the following sections:

- [Rack Requirements, page A-1](#)
- [Rack-Mounting Guidelines, page A-2](#)
- [Installing the Cisco MDS 9250i Switch in a Rack, page A-6](#)

Rack Requirements

This section provides the requirements for the following type of racks, assuming an external ambient air temperature range of 32 to 104°F (0 to 40°C):

- Cisco MDS 9250i chassis
- Standard open racks
- Two-post Telco racks

General Requirements for Racks

The rack must be one of the following types:

- Standard 19-inch four-post EIA rack, with mounting rails that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992. See the [“Standard Open Rack Requirements” section on page A-2](#) and the [“Standard Open Rack Requirements” section on page A-2](#).
- Standard two-post telco rack, with mounting rails that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992.

Rack Requirements for Cisco MDS 9250i Chassis

The rack must also meet the following requirements:

- The minimum vertical rack space per chassis is 1.75 in. (4.4 cm).
- The width between the mounting rails must be at least 17.75 in. (45.1 cm). For four-post EIA racks, this is the distance between the two front rails and rear rails.

Standard Open Rack Requirements

In addition to the requirements listed in the [“General Requirements for Racks”](#) section on page A-1, if you are mounting the chassis in an open rack (no side panels or doors), ensure that the rack meets the following requirements:

- The minimum width between two front-mounting rails must be one RU (rack unit), equal to 8 inches (20 cm).
- The minimum vertical rack space per chassis is one RU (rack unit), equal to 8 inches (20 cm).

**Note**

The side rail-mount brackets provided with the Cisco MDS 9250i switch require an additional height of 0.75 inches (1.9 cm). They are required during the installation of the Cisco MDS 9250i switch only, and can be removed or left installed once the front-mounting brackets are securely fastened to the mounting rails.

- The horizontal distance between the chassis and any adjacent chassis should be 6 inches (15.2 cm), and the distance between the chassis air vents and any walls should be 2.5 inches (6.4 cm).

Requirements Specific to Two-Post Telco Rack

In addition to the requirements listed in the [“General Requirements for Racks, page A-1”](#), two-post telco racks must meet the following requirements:

- The minimum width between the two mounting rails must be at least 17.75 inches (45.1 cm).
- The distance between the chassis air vents and any walls should be 2.5 inches (6.4 cm).

Rack-Mounting Guidelines

**Caution**

If the rack is on wheels, ensure that the brakes are engaged or the rack is otherwise stabilized.

**Caution**

If installing this kit in an EIA rack, attach the switch to all four rack-mounting rails; the EIA rails may not be thick enough to prevent flexing of the shelf brackets if only two rails are used.

Before rack-mounting the chassis, ensure that the rack meets the following requirements:

- The specifications listed in the [“Rack Requirements”](#) section on page A-1.
- The depth of the rack between the front-mounting and rear-mounting rails is at least 18 in. (45.7 cm) but less than or equal to 30 in. (76.2 cm). This is specific to four-post EIA racks.
- The airflow and cooling are adequate and there is sufficient clearance around the air vents on the switch, as described in [Appendix B, “Technical Specifications.”](#)
- The rack has sufficient vertical clearance for the chassis plus 2 RU for the shelf brackets, and any desired clearance for the installation process.

- The rack meets the minimum rack load ratings per rack unit listed in the following table:

Rack Type	MDS 9250i
EIA (4-Post)	7.5 lb (3.4 kg)

Before Installing the Rack-Mount Support Brackets

Before installing the rack-mount support brackets for the Cisco MDS 9250i switch, check the contents of your kit. [Table A-1](#) lists the contents of the optional shelf bracket kit.

Table A-1 Contents of Shelf Bracket Kit

Quantity	Part Description
2	Bottom support brackets
20	12-24 x 3/4-in. Phillips screws
20	M6 x 19 mm Phillips binder-head screws

Installing and Removing the Brackets

This section provides information on how to install and remove brackets.

Before installing the shelf brackets, check the contents of your kit. [Table A-2](#) lists the contents of the optional shelf bracket kit.

Table A-2 Contents of Shelf Bracket Kit

Quantity	Part Description
2	Slider brackets
2	Shelf brackets
1	Crossbar
2	10-32 x 3/8-in. Phillips pan-head screws
16	12-24 x 3/4-in. Phillips screws
16	10-24 x 3/4-in. Phillips screws

Required Equipment

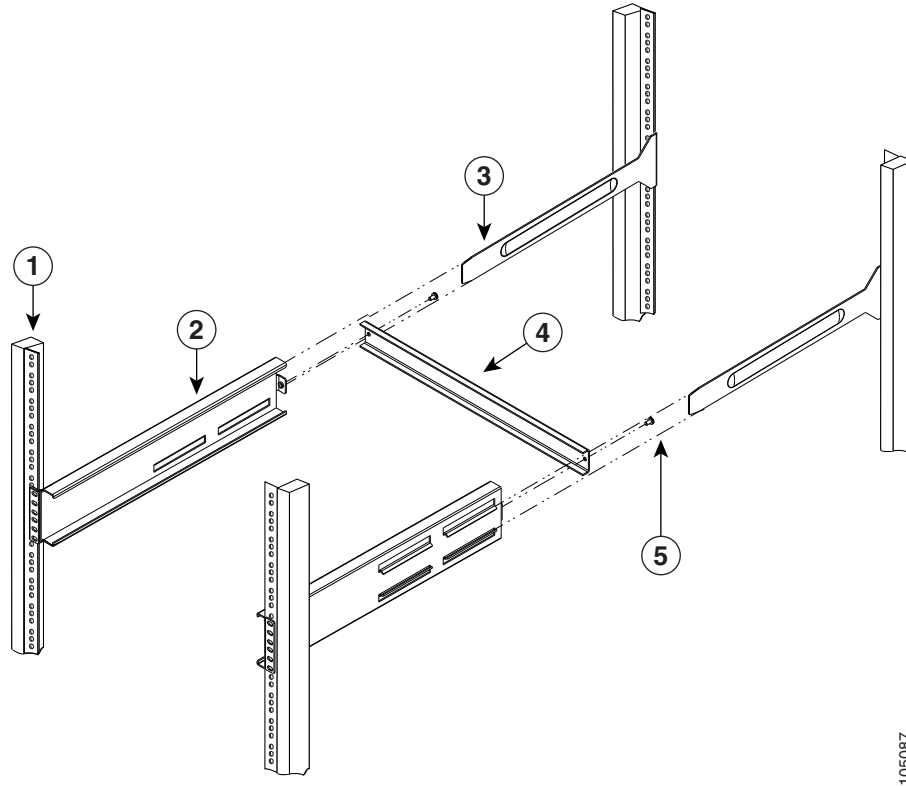
You need the following equipment for this installation:

- Number 2 Phillips screwdriver
- Tape measure and level (to ensure shelf brackets are level)

Installing the Shelf Bracket Kit into a Four-Post EIA Rack

Figure A-1 shows the installation of the shelf bracket kit into a four-post EIA rack.

Figure A-1 Installing the Shelf Bracket Kit into an EIA Rack



105087

1	Rack-mounting rail (4x)	4	Crossbar
2	Shelf bracket (2x)	5	10-32 screws (2x)
3	Slider rail (2)		

To install the shelf bracket in an EIA rack, follow these steps:

- Step 1** Position a shelf bracket inside the rack-mounting rails as shown in [Figure A-1](#). Align the screw holes at the front of the shelf bracket with the holes in the front rack-mounting rail. Attach the shelf bracket to the front rack-mounting rail using a minimum of four 12-24 or 10-24 screws.



Note The bottom hole of the shelf bracket should align with the bottom hole of a rack unit on the rack-mounting rail (the hole immediately above the 1/2-in. spacing).

- Step 2** Repeat with the other shelf bracket.
- Step 3** Verify that the shelf brackets are at the same height (using the level or tape measure as desired).

- Step 4** Attach the crossbar to the shelf brackets as shown in [Figure A-1](#), using the 10-32 screws.
- Step 5** Insert the slider rails into the shelf brackets as shown in [Figure A-1](#). Attach them to the rear rack-mounting rails using a minimum of four 12-24 or 10-24 screws.
-

Installing the Switch on the Brackets

This section provides information on how to install the switch on the rack-mount support brackets and on the shelf brackets and includes the following subsections:

- [Installing the Switch on the Rack-Mount Support Brackets, page A-5](#)
- [Installing the Switch on the Shelf Brackets, page A-8](#)

Installing the Switch on the Rack-Mount Support Brackets

This section provides general instructions for installing the switch on top of the rack-mount support brackets. For detailed installation instructions, see the [“Installing the Cisco MDS 9250i Switch Chassis in a Rack” section on page 2-5](#).

**Warning**

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

Statement 1017

**Warning**

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

Statement 1030

**Note**

Before you install, operate, or service the system, see the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family* for important safety information.

To install the switch on top of the rack-mount support brackets, follow these steps:

- Step 1** Verify that the rack-mount support brackets are level and securely attached to the rack-mounting rails, the support rack-mount support brace is securely attached to the brackets, and the rack is stabilized.
- Step 2** Slide a mechanical lift under the switch and lift the switch up onto the rack-mount support brackets, ensuring it is squarely positioned.
- Step 3** Attach the switch to the rack-mounting rails. See the [“Installing the Cisco MDS 9250i Switch Chassis in a Rack” section on page 2-5](#).

**Caution**

We recommend grounding the chassis, even if the rack is already grounded. There is a grounding pad with two threaded M4 holes on the chassis for attaching a grounding lug.

Installing the Cisco MDS 9250i Switch in a Rack

This section describes the procedure for installing a Cisco MDS 9250i switch in a nonthreaded rack. It includes the following information:

- [Rack-Mounting Guidelines, page A-6](#)
- [Before Installing the Shelf Brackets, page A-6](#)
- [Installing the Cisco MDS 9250i Shelf Bracket Kit into a Rack, page A-7](#)
- [Installing the Switch on the Shelf Brackets, page A-8](#)

Rack-Mounting Guidelines



Caution

If the rack is on wheels, ensure that the brakes are engaged or the rack is otherwise stabilized.

Before rack-mounting the chassis, ensure that the rack meets the following requirements:

- The specifications listed in the “[Rack Requirements](#)” section on [page A-1](#).
- The depth of the rack between the front-mounting and rear-mounting rails is fixed at 18 inches (45.7 cm).
- The rack-mounting rails are nonthreaded.
- The airflow and cooling are adequate and there is sufficient clearance around the air vents on the Cisco MDS 9250i switch, as described in [Appendix B, “Technical Specifications.”](#)
- The rack has sufficient vertical clearance for the chassis and any desired clearance for the installation process.

Before Installing the Shelf Brackets

Before installing the shelf brackets, check the contents of your kit. [Table A-3](#) lists the contents of the optional shelf bracket kit.

Table A-3 Contents of Cisco MDS 9250i Shelf Bracket Kit

Quantity	Part Description
2	Shelf brackets
16	1/4-20 x 3/4 in. Phillips pan-head screws with lock washers
12	10-32 x 1/3 in. Phillips pan-head screws with lock washers
12	10-32 clip nuts

Required Equipment

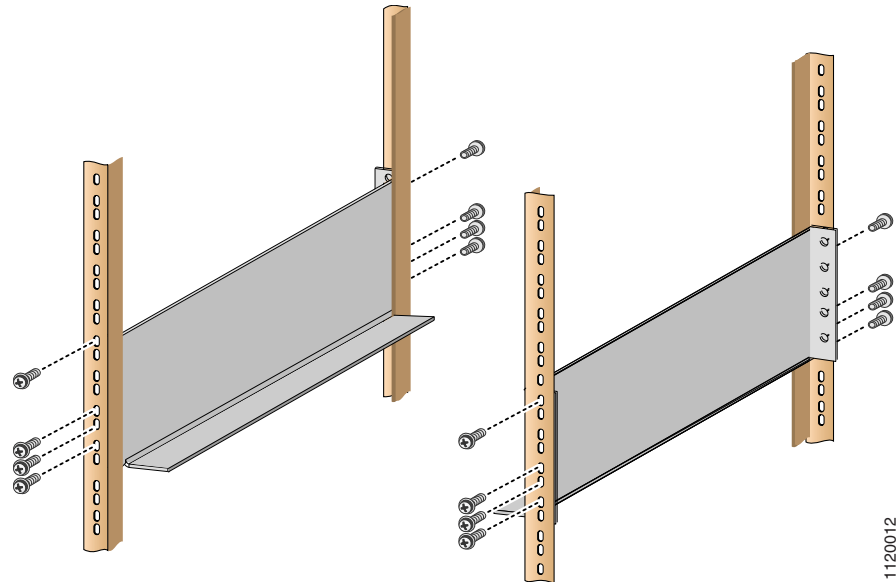
You need the following equipment for this installation:

- Number 2 Phillips screwdriver
- Tape measure and level (to ensure shelf brackets are level)

Installing the Cisco MDS 9250i Shelf Bracket Kit into a Rack

Figure A-2 shows the installation of the Cisco MDS 9250i Shelf Bracket Kit into a four-post rack.

Figure A-2 Installing the Shelf Bracket Kit into a Rack



To install the shelf brackets in a rack, follow these steps:

- Step 1** Position a shelf bracket inside the rack-mounting rails as shown in Figure A-2. Align the screw holes at the front of the shelf bracket with the holes in the front rack-mounting rail, and then attach the shelf bracket to the front rack-mounting rail using a minimum of four 1/4-20 screws.



Note The bottom hole of the shelf bracket should align with the bottom hole of a rack unit on the rack-mounting rail (the hole immediately above the 1/2-inch spacing).

- Step 2** Align the screw holes at the back of the shelf bracket with the holes in the back rack-mounting rail, and then attach the shelf bracket to the back rack-mounting rail using a minimum of four 1/4-20 screws.
- Step 3** Repeat Step 1 and Step 2 with the other shelf bracket.
- Step 4** Verify that the shelf brackets are at the same height (using the level or tape measure as desired).

Installing the Switch on the Shelf Brackets

This section provides general instructions for installing the Cisco MDS 9250i switch on top of the shelf brackets. For detailed installation instructions, see [“Installing the Cisco MDS 9250i Switch Chassis in a Rack” section on page 2-5](#).

**Warning**

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

Statement 1017

**Warning**

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

Statement 1030

**Caution**

Cisco recommends that you use a mechanical lift when the chassis is being moved or lifted. The Cisco MDS 9250i switch weighs approximately 449.5 lb (203.8 kg) when fully loaded with all modules and power supplies.

**Note**

Before you install, operate, or service the system, see the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family* for important safety information.

To install the Cisco MDS 9250i switch on top of the shelf brackets, follow these steps:

-
- Step 1** Verify that the shelf brackets are level and securely attached to the rack-mounting rails, and the rack is stabilized.
 - Step 2** Slide the Cisco MDS 9250i switch onto the shelf brackets, ensuring it is squarely positioned.
 - Step 3** Attach the Cisco MDS 9250i switch to the rack-mounting rails. Slide the clip nuts over the holes on the nonthreaded rails on the rack. These clip nuts provide the threading for the screws that will secure the chassis to the rack. Use the 12 10-32 x 1/2 inch screws provided in this shelf bracket kit to secure the chassis to the rack. See [“Installing the Cisco MDS 9250i Switch Chassis in a Rack” section on page 2-5](#).

**Caution**

We recommend grounding the chassis, although the rack is already grounded. There is a grounding pad with two threaded M4 holes on the chassis for attaching a grounding lug.



Technical Specifications

This appendix provides technical specifications and includes the following sections:

- [Switch Specifications, page B-1](#)
- [Power Specifications for the Cisco MDS 9250i Switch, page B-2](#)
- [SFP+ Transceiver Specifications, page B-4](#)



Note

Specifications for cables and connectors are provided in [Appendix C, “Cable and Port Specifications.”](#)

Switch Specifications

The Cisco MDS 9250i switch supports hot-swappable fan modules that provide 200 linear feet per minute (LFM) per minute of airflow with 300 W of power dissipation.

[Table B-1](#) lists the environmental specifications for the Cisco MDS 9250i switch.

Table B-1 *Environmental Specifications for the Cisco MDS 9250i switch*

Description	Specification
Temperature, certified for operation	32 to 104°F (0 to 40°C)
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	10 to 90%
Humidity (RH), ambient (noncondensing) nonoperating and storage	5 to 95%
Altitude, certified for operation	-197 to 6500 ft (-60 to 2000 m)
Altitude, designed and tested for operation	-200 to 10000 ft (-60 to 3000 m)

Table B-2 lists the physical specifications for the Cisco MDS 9250i switch.

Table B-2 Physical Specifications for the Cisco MDS 9250i switch

Description	Specification
Dimensions (HxWxD)	3.84 x 17.22 x 21.4 in. (9.75 x 43.74 x 54.36 cm); 2RU
Weight	22.4 lb (10.2 kg) Chassis configured with three power supply modules and two fan modules
Front-to-back airflow	278 LFM

Power Specifications for the Cisco MDS 9250i Switch

This section includes the following topics:

- [General Power Supply Specifications, page B-2](#)
- [Power Supply Requirements and Heat Dissipation Specifications, page B-3](#)
- [AC Power Consumption, page B-3](#)
- [Connection Guidelines for AC-Powered Systems, page B-3](#)

General Power Supply Specifications

Table B-3 lists the specifications for the Cisco MDS 9250i switch AC input power supply.

Table B-3 Cisco MDS 9250i switch AC Input Power Supply Specifications

AC Input Power Supply	Specification
AC input voltage	Minimum = 85 VAC Nominal = 100 to 240 VAC Maximum = 264 VAC
AC input current rating (maximum)	4.7 A at 85 VAC 3.6 A at 110 VAC 1.8 A at 220 VAC
AC input frequency	Minimum = 47 Hz Nominal = 50 to 60 Hz Maximum = 63 Hz
Power supply output capacity	300 W
Power supply output voltage	12 V +/- 6% up to 25 A
Output holdup time	20ms when input > 100 VAC

AC Power Consumption

Table B-6 shows the typical AC power consumption for the Cisco MDS 9250i Multiservice switch.

Table B-4 Typical AC Power Consumption for the Cisco MDS 9250i Multiservice Switch

	AC Volt (V)	AC Power (W)
Typical Value ¹	220	319
	110	333
Worst Value ²	220	406
	11	425

¹Typical Value is at 25 C ambient temperature, 0% voltage margin, fully-populated with SFPs, and 50% traffic load.

²Worst Value is at 55C ambient temperature , 5% voltage margin, fully-populated with SFPs, and 100% traffic load.

Connection Guidelines for AC-Powered Systems

For connecting the Cisco MDS 9250i switch AC power supplies to the site power source, follow these basic guidelines:

- Each power supply should have its own dedicated branch circuit.
- For international, circuits should be sized according to local and national codes.

The AC power receptacles used to plug in the chassis must be the grounding type. The grounding conductors that connect to the receptacles should connect to protective earth ground at the service equipment.

SFP+ Transceiver Specifications

The Cisco MDS 9250i switch is compatible with SFP+ transceivers and cables that have LC connectors. The wavelength of each transceiver must match the transceiver on the other end of the cable, and the cable must not exceed the stipulated cable length for reliable communications.

Cisco SFP+ transceivers provide the uplink interfaces, laser transmit (TX) and laser receive (RX), and support 850 to 1610 nm nominal wavelengths, depending upon the transceiver.

Use only Cisco SFP+ transceivers on the Cisco MDS 9250i switches. Each Cisco SFP+ transceiver is encoded with model information that enables the switch to verify that the SFP+ transceiver meets the requirements for the switch.

This section provides the following topics:

- [Cisco Fibre Channel SFP+ Transceivers, page B-4](#)

Cisco Fibre Channel SFP+ Transceivers

Table B-6 lists the Cisco 1- Gbps, 8-Gbps, 10-Gbps, and 16-Gbps SFP+ Fibre Channel transceivers.

Table B-5 Cisco 8-Gbps and 16-Gbps SFP+ Fibre Channel Transceivers

Transceiver Module Product Number	Description	Type
DS-SFP-FC16G-SW	4/8/16-Gbps Fibre Channel SW, SFP+, LC	Short wavelength
DS-SFP-FC16G-LW	4/8/16-Gbps Fibre Channel LW, SFP+, LC	Long wavelength
DS-SFP-FC8G-SW	2/4/8-Gbps Fibre Channel SW, SFP+, LC	Short wavelength
DS-SFP-FC8G-LW	2/4/8-Gbps Fibre Channel LW, SFP+, LC	Long wavelength

General Specifications for Cisco 16-Gbps Fibre Channel SFP+ Transceivers

Table B-7 provides the general specifications for Cisco 16-Gbps Fibre Channel SFP+ transceivers.

Table B-6 General Specifications for Cisco 16-Gbps Fibre Channel SFP+ Transceivers

SFP+	Wavelength (nanometer)	Fiber Type	Core Size (micron)	Baud Rate (GBd)	Cable Distance (meter)
DS-SFP-FC16G-SW	850	MMF	62.5	14025	150 m
DS-SFP-FC16G-LW	1310	SMF	G.652	14025	6.2 miles (10 km)

Environmental and Power Requirements for Cisco 16-Gbps Fibre Channel SFP+ Transceivers

Table B-8 provides the power specification for the Cisco 16-Gbps Fibre Channel SFP+ transceivers.

Table B-7 Power Requirements Specification for Cisco 16-Gbps Fibre Channel SFP+ Transceivers

SFP+	Average Transmit Power (dBm)		Average Receive Power (dBm)		Fiber Loss Budget (dBm)		
	Maximum	Minimum	Maximum	Minimum			
DS-SFP-FC16G-SW	-1.3	-9 (4 Gbps) -8.2 (8 Gbps) -7.8 (16 Gbps)	0	-	12	12	12
DS-SFP-FC16G-LW	1.3	-9 (4 Gbps) -8.2 (8 Gbps) -7.8 (16 Gbps)	0	-	12	12	12

Table B-9 provides the environment specification for the Cisco 16-Gbps Fibre Channel SFP+ transceivers.

Table B-8 Environmental Specifications for Cisco 16-Gbps Fibre Channel SFP+ Transceivers

SFP+	Operating		Storage	
	Maximum	Minimum	Maximum	Minimum
DS-SFP-FC16G-SW	40°C	0°C	85°C	-40°C
DS-SFP-FC16G-LW	40°C	0°C	85°C	-40°C

For information about safety, regulatory, and standards compliance, refer to the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*.

General Specifications for Cisco 10-Gbps Fibre Channel SFP+ Transceivers

Table B-10 provides the general specifications for Cisco 10-Gbps Fibre Channel SFP+ transceivers.

Table B-9 General Specifications for Cisco 10-Gbps Fibre Channel SFP+ Transceivers

SFP+	Wavelength (nanometer)	Fiber Type	Core Size (micron)	Baud Rate (GBd)	Cable Distance (meter)
DS-SFP-FC10G-SW	850	MMF	62.5 (OM1)	10.518	33m (104 ft)
			50 (OM3)	10.518	82m (269 ft)
			50 (OM3)	10.518	300m (984 ft)
DS-SFP-FC10G-LW	1310	SMF	9.0	10.518	10 km (6.2 miles)

Environmental and Power Requirements for Cisco 10-Gbps Fibre Channel SFP+ Transceivers

Table B-11 provides the power specification for the Cisco 10-Gbps Fibre Channel SFP+ transceivers.

Table B-10 Power Requirements Specification for Cisco 10-Gbps Fibre Channel SFP+ Transceivers

SFP+	Average Transmit Power (dBm)		Average Receive Power (dBm)		Fiber Loss Budget (dBm)
	Maximum	Minimum	Maximum	Minimum	
DS-SFP-FC10G-SW	-1.3	-7.3	-1.0	-9.9	7.3
DS-SFP-FC10G-LW	0.5	-8.2	-1.0	-9.9	7.4

Table B-12 provides the environment specification for the Cisco 10-Gbps Fibre Channel SFP+ transceivers.

Table B-11 Environmental Specifications for Cisco 10-Gbps Fibre Channel SFP+ Transceivers

SFP+	Operating		Storage	
	Maximum	Minimum	Maximum	Minimum
DS-SFP-FC10G-SW	40°C	0°C	85°C	-40°C
DS-SFP-FC10-LW	40°C	0°C	85°C	-40°C

For information about safety, regulatory, and standards compliance, refer to the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*.

General Specifications for Cisco 8-Gbps Fibre Channel SFP+ Transceivers

Table B-13 provides the general specifications for Cisco Fibre Channel SFP+ transceivers.

Table B-12 General Specifications for Cisco 8-Gbps Fibre Channel SFP+ Transceivers

SFP+	Wavelength (nanometer)	Fiber Type	Core Size (micon)	Baud Rate (GBd)	Cable Distance (meter)
DS-SFP-FC8G-SW	850	MMF	62.5	8.5	150 m (492 ft)
DS-SFP-FC8G-LW	1310	SMF	9.0	8.5	6.2 miles (10 km)

Environmental and Power Requirements for Cisco 8-Gbps Fibre Channel SFP+ Transceivers

Table B-14 provides the power specification for the Cisco 8-Gbps Fibre Channel SFP+ transceivers.

Table B-13 Power Requirements Specification for Cisco 8-Gbps Fibre Channel SFP+ Transceivers

SFP	Average Transmit Power (dBm)		Average Receive Power (dBm)		Fiber Loss Budget (dBm)		
	Maximum	Minimum	Maximum	Minimum			
DS-SFP-FC8G-SW	-1.3	-10 (2 Gbps) -9 (4 Gbps) -8.2 (8 Gbps)	0	–	62.5 microns	50.0 microns [OM2]	50.0 microns [OM3]
					2.10 (2 Gbps) 1.78 (4 Gbps) 1.58 (8 Gbps)	2.62 (2 Gbps) 2.06 (4 Gbps) 1.68 (8 Gbps)	3.31 (2 Gbps) 2.88 (4 Gbps) 2.04 (8 Gbps)
DS-SFP-FC8G-LW	-3 (2 Gbps) -1 (4 Gbps) +0.5 (8 Gbps)	-11.7 (2 Gbps) -8.4 (4 Gbps) -8.4 (8 Gbps)	-3 (2 Gbps) -1 (4 Gbps) +0.5 (8 Gbps)	–	7.8 (2 Gbps) 7.8 (4 Gbps) 6.4 (8 Gbps)		

Table B-15 provides the environment specification for the Cisco 8-Gbps Fibre Channel SFP+ transceivers.

Table B-14 Environmental Specifications for Cisco 8-Gbps Fibre Channel SFP+ Transceivers

SFP+	Operating		Storage	
	Maximum	Minimum	Maximum	Minimum
DS-SFP-FC8G-SW	40°C	0°C	85°C	-40°C
DS-SFP-FC8G-LW	40°C	0°C	85°C	-40°C

For information about safety, regulatory, and standards compliance, refer to the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*.

Maximum Environmental and Electrical Ratings for Cisco Fibre Channel SFP+ Transceivers

Table B-16 provides the maximum environmental and electrical ratings for Cisco Fibre Channel SFP+ transceivers.

Table B-15 Maximum Environmental and Electrical Ratings for Cisco Fibre Channel SFP+ Transceivers

Parameter ¹	Symbol	Min.	Max. ²	Unit	Notes
Storage temperature	T _S	-40	85	°C	1
Case temperature	T _C	0	70	°C	1, 2
Relative humidity	RH	5	95	%	1

1. Do not operate outside the recommended operating conditions. Device reliability may be affected and damage to the device may occur over an extended period of time.
2. Absolute maximum ratings are those values beyond which damage to the device may occur if these limits are exceeded for other than a short period of time.

For information about safety, regulatory, and standards compliance, refer to the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*.



Cable and Port Specifications

This appendix provides the cable and port specifications, and includes the following sections:

- [Cables and Adapters Provided, page C-1](#)
- [Console Port, page C-2](#)
- [MGMT 10/100/1000 Ethernet Port, page C-3](#)
- [Supported Power Cords and Plugs, page C-4](#)

Cables and Adapters Provided

The Cisco MDS 9250i switch accessory kit includes the following items:

- RJ-45 rollover cable
- RJ-45/DSUB F/F adapter—RJ-45 to DB-25 female DTE adapter (labeled “Terminal”)
- RJ-45/DSUB R/P adapter—RJ-45 to DB-25 male DCE adapter (labeled “Modem”)



Note

Additional cables and adapters can be ordered from your customer service representative.



Note

If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco Systems, contact Cisco Technical Support at this URL:
http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

Console Port

The console port is an asynchronous RS-232 serial port with an RJ-45 connector. You can use the RJ-45 rollover cable and the RJ-45/DSUB F/F adapter or the RJ-45F PC terminal adapter to connect the console port to a computer running terminal emulation software.

Console Port Pinouts

Table C-1 lists the pinouts for the console port on the Cisco MDS 9250i switch.

Table C-1 Console Port Pinouts

Pin	Signal
1 ¹	RTS
2	DTR
3	TxD
4	GND
5	GND
6	RxD
7	DSR
8	CTS

1. Pin 1 is connected internally to pin 8.

Connecting the Console Port to a Computer Using the DB-25 Adapter

You can use the RJ-45 rollover cable and RJ-45/DSUB F/F adapter (labeled “Terminal”) to connect the console port to a computer running terminal emulation software. Table C-2 lists the pinouts for the console port, the RJ-45 rollover cable, and the RJ-45/DSUB F/F adapter.

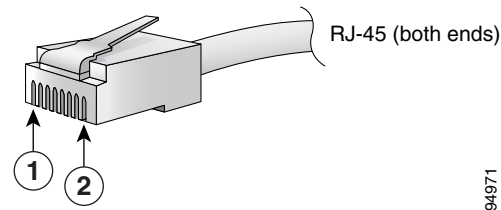
Table C-2 Port Mode Signaling and Pinouts with the DB-25 Adapter

Console Port Signal	RJ-45 Rollover Cable		RJ4-5/DSUB F/F Terminal Adapter	Console Device Signal
	RJ-45 Pin	RJ-45 Pin	DB-25 Pin	
RTS	1	8	5	CTS
DTR	2	7	6	DSR
TxD	3	6	3	RxD
GND	4	5	7	GND
GND	5	4	7	GND
RxD	6	3	2	TxD
DSR	7	2	20	DTR
CTS	8	1	4	RTS

MGMT 10/100/1000 Ethernet Port

The MGMT 10/100/1000 Ethernet port is an Ethernet port with an RJ-45 connector. You can use a modular, RJ-45, straight-through UTP cable to connect the management port to an external hub, switch, or router (see [Figure C-1](#)).

Figure C-1 RJ-45 Interface Cable Connector



1	Pin 1	2	Pin 8
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[Table C-3](#) lists the connector pinouts and signal names for a 10/100/1000BASE-T management port (MDI) cable.



Note

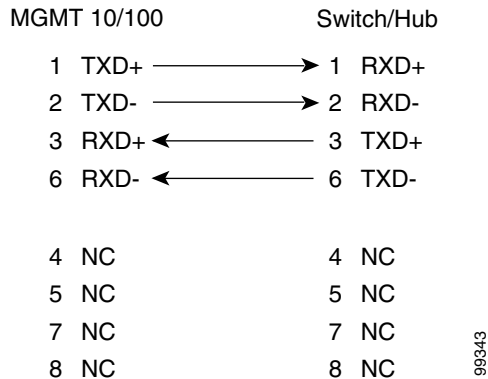
The RJ-45 interface only uses pins 1, 2, 3, and 6.

Table C-3 10/100/1000BASE-T Management Port Cable Pinout (MDI)

Pin	Signal
1	TD+
2	TD-
3	RD+
6	RD-
4	Not used
5	Not used
7	Not used
8	Not used

Figure C-2 shows a schematic of the 10/100/1000BASE-T cable required to connect the management port to a switch or hub (not provided with the switch).

Figure C-2 Twisted-Pair 10/100/1000BASE-T Cable Schematic



Supported Power Cords and Plugs

Each power supply has a separate power cord. Standard power cords or jumper power cords are available for connection to a power distribution unit having IEC 60320 C19 outlet receptacles.

Power Cords

The standard power cords have an IEC C19 connector on the end that plugs into the switch. The optional jumper power cords have an IEC C19 connector on the end that plugs into the switch, and an IEC C20 connector on the end that plugs into an IEC C19 outlet receptacle.



Note

Only the regular power cords or jumper power cords provided with the switch are supported.

Table C-4 lists the power cords for the Cisco MDS 9250i switch and provides their lengths in feet and meters.

Table C-4 Power Cords for the MDS 9250i Switch

Description	Length	
	Feet	Meters
MDS 9250i - 300W Power Supply		
Power Cord, 250VAC 20A NEMA, 6-20 Plug, USA	13.12	4
Power Cord, 250VAC 20A NEMA L6-20 Twist Lock Plug, USA	13.58	4.14
Power Cord, 250VAC 16A CEE 7/7 Plug, EU	13.12	4
Power Cord, 250VAC 16A IEC 309 Plug, International	13.58	4.14
Power Cord, 250VAC 16A SEV 1011 Plug, Switzerland	8	2.44
Power Cord, 250VAC SABS 1661 Plug, South Africa	14	4.27

Table C-4 Power Cords for the MDS 9250i Switch (continued)

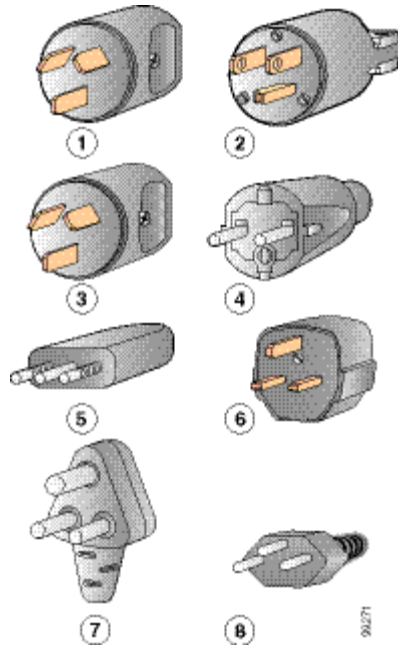
Description	Length	
	Feet	Meters
Power Cord, 250VAC 16A SI16S3 Plug, Israel	14	4.27
Power Cord 250VAC 16A, Src Plug EL224-C19, Brazil,	14	4.27
Power Cord 250VAC 16A, Src Plug IR2073-C19, Argentina,	14	4.27

Power Cords

The standard power cords have an IEC C15 connector on the end that plugs into the switch. The optional jumper power cords have an IEC C15 connector on the end that plugs into the switch, and an IEC C14 connector on the end that plugs into an IEC C13 outlet receptacle.


Note

Only the standard power cords or jumper power cords provided with the switch are supported.

Figure C-3 300-W Power Supply Plugs**300-W Power Supply Plugs**

1	Argentina, IRAM 2073 plug (10 A)	5	Italy 1/3G plug, CEI 23-16 (10 A)
2	North America NEMA 5-15P plug (15 A)	6	United Kingdom BS89/13, BS 1363/A (13 A; replaceable fuse)
3	Australia, New Zealand SAA/3 plug, AS/NZS 3112-1993 (10 A)	7	South Africa EL 208, SABS 164-1 (10 A)
4	Europe VIIG Plug, CEE (7) VII (16 A)	8	Switzerland 12G SEV 1011 (10 A)



Site Planning and Maintenance Records

This appendix provides a Site Planning list and includes the following records to use when installing the Cisco MDS 9250i switch:

- [Contacting Customer Service, page D-1](#)
- [Site Preparation Checklist, page D-2](#)
- [Contact and Site Information, page D-2](#)
- [Chassis and Module Information, page D-4](#)



Note

For information on how to query the switch for configuration information, see *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide* or the *Cisco Fundamentals Configuration Guide for DCNM SAN*.

Contacting Customer Service

If you are unable to solve a startup problem after using the troubleshooting suggestions in this appendix, contact your customer service representative for assistance and further instructions. Before you call, have the following information ready to help your service provider assist you as quickly as possible:

- Date you received the switch.
- Chassis serial number. See the [“Finding the Chassis Serial Number”](#) section on page D-2.
- Type of software and release number.
- Maintenance agreement or warranty information.
- Brief description of the problem.
- Brief explanation of the steps you have already taken to isolate and resolve the problem.



Note

If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

Finding the Chassis Serial Number



Tip

If you have CLI access, enter the **show sprom backplane 1** command to display the backplane contents, including the switch serial number.

Site Preparation Checklist

Planning the location and layout of your equipment rack or wiring closet is essential for successful switch operation, ventilation, and accessibility. [Table D-1](#) lists the site planning tasks that Cisco recommends completing before installing the Cisco MDS 9700 switch.

Consider heat dissipation when sizing the air-conditioning requirements for an installation. See [Table B-1 on page B-1](#) for the environmental requirements. See the “[Power Specifications for the Cisco MDS 9250i Switch](#)” section on [page B-2](#), the “[Power Specifications for the Cisco MDS 9250i Switch](#)” section on [page B-2](#), and the for power and heat ratings.

Contact and Site Information

Use the following worksheet ([Table D-1](#)) to record contact and site information.

Table D-1 Contact and Site Information

Contact person	
Contact phone	
Contact e-mail	
Building/site name	
Data center location	
Floor location	
Address (line 1)	
Address (line 2)	
City	
State	

Table D-1 *Contact and Site Information (continued)*

Zip code	
Country	

Chassis and Module Information

Use the following worksheets ([Table D-2](#) and [Table D-3](#)) to record information about the chassis and modules.

Contract number _____

Chassis serial number _____

Product number _____

Table D-2 *Network-Related Information*

Switch IP address	
Switch IP netmask	
Host name	
Domain name	
IP broadcast address	
Gateway/router address	
DNS address	
Modem telephone number	

Table D-3 *Module Information*

Slot	Module Type	Module Serial Number	Notes
1			
2			
3			
4			
5	Supervisor		

Table D-3 *Module Information (continued)*

Slot	Module Type	Module Serial Number	Notes
6	Supervisor		
7			
8			
9			



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