



## Cabinet and Rack Installation

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This appendix provides the following information:

- [Cabinet and Rack Requirements, page A-1](#)
- [Cisco MDS 9000 Family Telco and EIA Shelf Bracket, page A-4](#)

## Cabinet and Rack Requirements

This section provides the Cisco MDS 9000 Family requirements for the following types of cabinets and racks, assuming an external ambient air temperature range of 0–40 Celsius:

- Standard perforated cabinets
- Solid-walled cabinets with a roof fan tray (bottom to top cooling)
- Standard open racks
- Telco racks



**Note**

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If you are selecting an enclosed cabinet, we recommend one of the thermally validated types listed above: standard perforated or solid-walled with a fan tray.

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## General Requirements for Cabinets and Racks

The cabinet or rack must be one of the following rack types:

- Standard 19” four-post EIA cabinet or rack, with mounting rails that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992. See [Requirements Specific to Perforated Cabinets, page A-2](#) and [Requirements Specific to Solid-Walled Cabinets, page A-3](#) for specific requirements for four-post cabinets or racks.
- Standard two-post Telco rack, with mounting rails that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992. See [Requirements Specific to Telco Racks, page A-3](#) for specific requirements for two-post Telco racks.

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The cabinet or rack must also meet the following requirements:

- Have the following minimum vertical rack space per chassis: 1 rack unit (RU), equal to 1.75 inches (4.4 cm).
- The width between the rack mounting rails must be at least 17.75 inches (45.1 cm). For four-post EIA racks, this is the distance between the two front rails.
- For four-post EIA cabinets (perforated or solid-walled):
  - To ensure the minimum bend radius for fiber optic cables, the front mounting rails of the cabinet should be offset from the front door by a minimum of 3 inches (7.6 cm), and a minimum of 5 inches (12.7 cm) if cable management brackets are installed on the front of the chassis.
  - The distance between the outside face of the front mounting rail and the outside face of the back mounting rail should be 23.5 - 34.0 inches (59.7 - 86.4 cm) to allow for rear bracket installation.
  - There should be a minimum of 2.5 inches (6.4 cm) clear space between the side edge of the chassis and the side wall of the cabinet. No sizeable flow obstructions should be immediately in the way of the chassis air intake or exhaust vents.



**Note**

Jumper power cords are an available power cord option, for use in a cabinet. For more information, see the [“Jumper Power Cord” section on page C-5](#).

## Requirements Specific to Perforated Cabinets

In addition to the requirements listed in the [“General Requirements for Cabinets and Racks” section on page A-1](#), perforated cabinets must meet the following requirements:

- The front and rear doors must have at least 60% open area perforation pattern, with at least 15 square inches of open area per rack unit of door height.
- It is recommended that the roof be perforated with at least 20% open area, unless the cabinet only contains Cisco MDS 9020 Fabric Switches, in which case the roof does not have to be perforated.
- An open or perforated cabinet floor enhances cooling but is not required.

## Reference Perforated Cabinet

A perforated cabinet that conforms to the above requirements is available from Rittal Corporation:

**Rittal Corporation**

One Rittal Place

Springfield, OH 45504

Contact: Rittal Corporation, service/sales: 800-477-4000

Cabinet P/N: Rittal 9969427

Cabinet description: PS-DK/OEM Cabinet Assembly, 600W X 1000D x 1998H (42U)

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## Requirements Specific to Solid-Walled Cabinets

In addition to the requirements listed in the [“General Requirements for Cabinets and Racks”](#) section on [page A-1](#), solid-walled cabinets must meet the following requirements:

- A roof mounted fan tray and an air cooling scheme in which the fan tray pulls air in at the bottom of the cabinet and exhausts it out the top, with a minimum of 500 CFM of airflow exiting the cabinet roof via the fan tray.
- Non-perforated (solid and sealed) front and back doors and side panels so that air travels predictably from bottom to top.
- The overall cabinet depth should be 36 - 42 inches (91.4 - 106.7 cm) to allow the doors to close and adequate airflow.
- A minimum of 150 square inches (968 square cm) of open area at the floor air intake of the cabinet.
- The lowest piece of equipment should be installed a minimum of 1.75 inches (4.4 cm) above the floor openings to prevent blocking the floor intake.

## Requirements Specific to Standard Open Racks

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

- Width between two front mounting rails: minimum of 17.75 inches (45.1 cm)
- Minimum vertical rack space per chassis: 1 rack unit (RU), equal to 1.75 inches (4.4 cm)
- The distance between the outside face of the front mounting rail and the outside face of the back mounting rail should be 23.5 - 34.0 inches (59.7 - 86.4 cm) to allow for rear bracket installation.
- The distance between the chassis air vents and any walls should be 2.5 inches (6.4 cm).

## Requirements Specific to Telco Racks

In addition to the requirements listed in the [“General Requirements for Cabinets and Racks”](#) section on [page A-1](#), Telco racks should meet the following requirements:

- The width of the rack between the two rack mounting rails is 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).

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## Cisco MDS 9000 Family Telco and EIA Shelf Bracket



### Note

This kit is optional and is not provided with the switch; to order the kit, contact your switch supplier.

This section describes the procedure for installing a switch in a rack or cabinet using the optional Telco and EIA Shelf Bracket kit, and provides the following information:

- [Supported Uses for the Telco and EIA Shelf Bracket Kit, page A-4](#)
- [Rack Mounting Guidelines, page A-4](#)
- [Installation Procedure, page A-5](#)
  - [Installing the Shelf Bracket Kit into a Four-Post EIA Rack, page A-5](#)
  - [Installing the Shelf Bracket Kit into a Two-Post Telco Rack, page A-6](#)
  - [Installing the Switch on the Shelf Brackets, page A-7](#)
  - [Removing the Shelf Bracket Kit \(Optional\), page A-8](#)

## Supported Uses for the Telco and EIA Shelf Bracket Kit

The Shelf Bracket Kit can be used to support the switch in the following situations:

- As a permanent support when installing a Switch in a two-post Telco rack.
- As a temporary or permanent support when installing a switch in a four-post EIA rack (can use to provide support during installation and then remove once rear brackets are securely attached to rack mounting rails).

## Rack Mounting Guidelines



### Caution

If the rack is on wheels, ensure 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 cabinet or rack meets the following requirements:

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

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## Installation Procedure

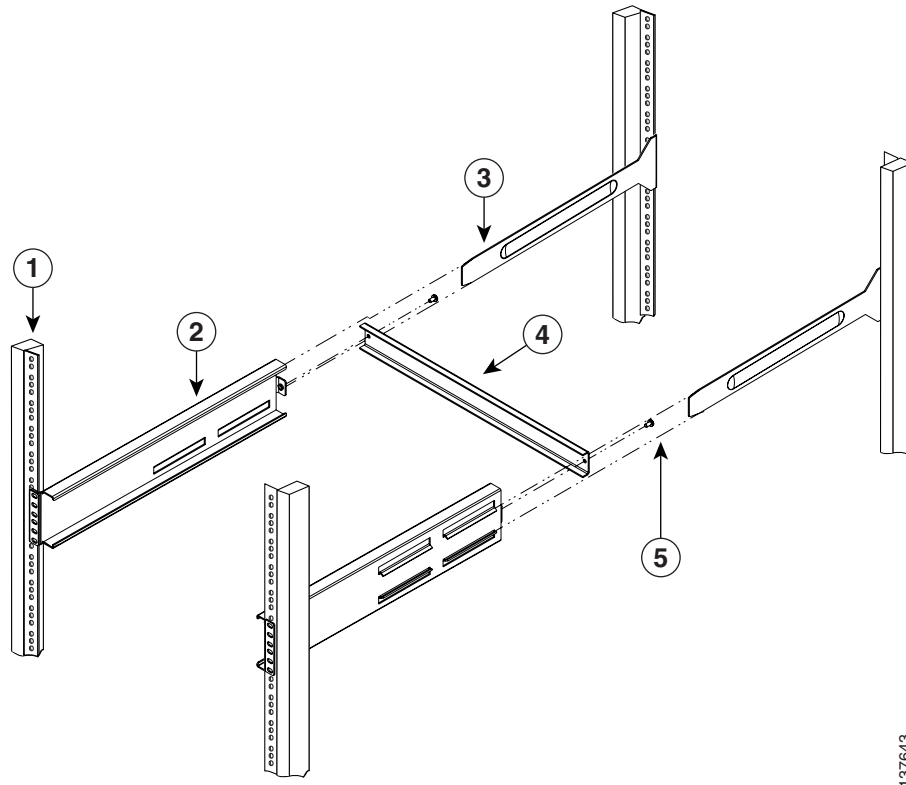
To install the shelf bracket kit, you will need the following:

- No. 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



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

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To install the shelf brackets in an EIA rack, perform the following steps:

- Step 1** Position a shelf bracket inside the rack mounting rails as shown in Figure A-1 and align the screw holes at the front of the shelf bracket with the holes in the front rack mounting rail, then attach the shelf bracket to the front rack mounting rail using a minimum of four 12-24 or 10-24 screws.



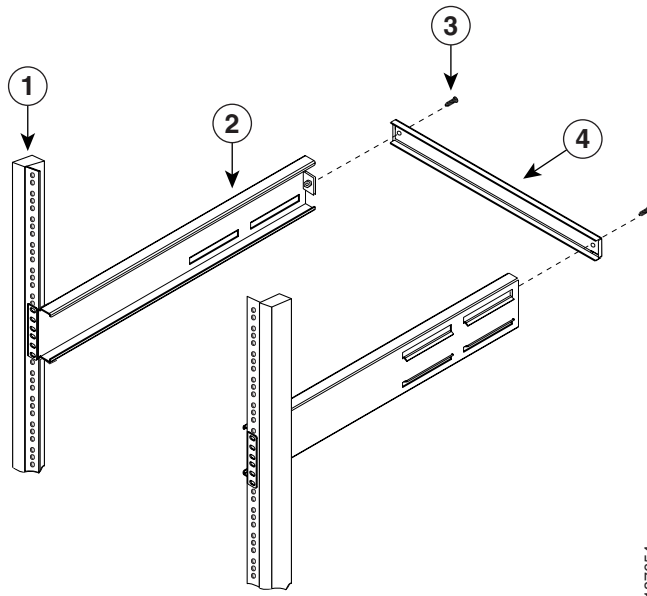
**Note** The bottom hole of the shelf bracket should align with the bottom hole of a rack unit on the rack mounting rail (the hole immediately above the 1/2" spacing).

- 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, then attach them to the rear rack mounting rails using a minimum of four 12-24 or 10-24 screws.

## Installing the Shelf Bracket Kit into a Two-Post Telco Rack

Figure A-2 shows the installation of the shelf bracket kit into a two-post Telco rack.

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



<b>1</b>	Rack Mounting Rail (2x)	<b>3</b>	10-32 screws (2x)
<b>2</b>	Shelf bracket (2x)	<b>4</b>	Crossbar

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To install the shelf brackets in a Telco rack, perform the following steps:

- Step 1** Position a shelf bracket inside a rack mounting rail as shown in [Figure A-2](#) and align the screw holes at the front of the shelf bracket with the holes in the rack mounting rail, then attach the shelf bracket to the 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" 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 rear of the shelf brackets as shown in [Figure A-2](#), using the 10-32 screws.

## Installing the Switch on the Shelf Brackets

This section provides general instructions for installing the switch on top of the shelf brackets. For detailed installation instructions, see the [“Installing the Switch in a Cabinet or 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, refer to the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family Switch* for important safety information.

To install the switch on top of the shelf brackets, perform the following steps:

- Step 1** Verify that the shelf brackets are level and securely attached to the rack mounting rails, the crossbar is securely attached to the shelf brackets, and the rack is stabilized.
- Step 2** Slide the switch onto the shelf brackets, ensuring it is squarely positioned.
- Step 3** Attach the switch to the rack mounting rails. See the [“Installing the Switch in a Cabinet or Rack”](#) section on [page 2-5](#).

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## Removing the Shelf Bracket Kit (Optional)

The Shelf Bracket Kit can be removed once the switch has been installed in a four-post EIA rack, and both front rack mount brackets and both C brackets are securely attached to the rack mounting rails.

To remove the shelf bracket kit, perform the following steps:

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- Step 1** Remove the screws fastening the slider brackets to the rear rack mounting rails then slide the slider brackets out of the shelf brackets.
  - Step 2** Remove the screws fastening the crossbar to the shelf brackets and remove the crossbar.
  - Step 3** Remove the screws fastening the shelf brackets to the front rack mounting rails and remove the shelf brackets from the rack.
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