Rack Installation

This chapter provides information on the rack installation and includes the following sections:
- Rack Requirements, page 2-65
- Rack-Mounting Guidelines, page 2-69
- Installing and Removing the Brackets, page 2-69
- Installing the Switch on the Brackets, page 2-71

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):
- General Requirements for Open Four-Post Racks, page 2-65
- General Rack and Cabinet Requirements for Cisco MDS 9700 Series Directors, page 2-65
- Rack and Cabinet Requirements for the Cisco MDS 9718 Chassis, page 2-66
- Rack and Cabinet Requirements for the Cisco MDS 9710 Chassis, page 2-66
- Rack and Cabinet Requirements for the Cisco MDS 9706 Chassis, page 2-67
- Clearance Requirements for Cisco MDS 9700 Series Directors, page 2-67

General Requirements for Open Four-Post Racks

The rack must be a 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 “Clearance Requirements for Cisco MDS 9700 Series Directors” section on page 2-67 section.

General Rack and Cabinet Requirements for Cisco MDS 9700 Series Directors

You can install the following types of racks or cabinets for your switch:
- Standard perforated-doors cabinets
- Solid-walled cabinets with a roof fan module (bottom to top cooling)
- Standard open four-post Telco racks
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Rack Requirements

- Standard open two post Telco racks

Cisco MDS 9700 Series Directors are compatible with Cisco racks (such as Cisco R42612) and PDUs.

Use a standard 19 inch, four post Electronic Industries Alliance (EIA) cabinet or rack with mounting rails that conform to English universal hole spacing per section 1 of the ANSI/EIA-310-D-1992 standard.

The depth of a four post rack or a cabinet must be 24 to 32 inches (61.0 to 81.3 cm) between the front and rear mounting vertical rails.

Ensure that the airflow and cooling are adequate and there is sufficient clearance around the air vents on the switch, as described in Appendix 6, “Technical Specifications.”

The rack must have sufficient vertical clearance for the chassis along with 2 RU for the shelf brackets, and any desired clearance for the installation process.

The front and rear doors of enclosed racks must have at least 60% open area perforation pattern.

Additionally, you must consider the following site requirements for the rack:

- Power receptacles must be located within reach of the power cords used with the switch.
  - AC power supplies
  - Power cords for 3-kW AC power supplies are 8 to 12 feet (2.5 to 4.3 m) long.
  - DC power supplies
  - Power cords for 3.0-kW DC power supplies are supplied and dimensioned by the customer.
  - HVAC/HVDC power supplies
  - Power cords for 3.5-kW HVAC/HVDC power supplies are 14 feet (4.26 m) long.

- Where necessary, have a seismic rating of Network Equipment Building Standards (NEBS) Zone 3 or Zone 4, per GR-63-CORE.

Rack and Cabinet Requirements for the Cisco MDS 9718 Chassis

To correctly install the switch in a cabinet that is located in a hot-aisle/cold-aisle environment, you should fit the cabinet with baffles to prevent exhaust air from recirculating into the chassis air intake.

Work with your cabinet vendors to determine which of their cabinets meet the following requirements or see the Cisco Technical Assistance Center (TAC) for recommendations:

- The height of the rack or cabinet must accommodate the 25 RU (43.75 inches or 111.1 cm) height of the switch and its bottom support bracket.
- Minimum gross load rating of 2000 lb (907.2 kg) (static load rating) if supporting two switches.

Rack and Cabinet Requirements for the Cisco MDS 9710 Chassis

The rack must meet the following requirements:

- The minimum vertical rack space per chassis is 24.5 inches (62.2 cm) or 14 RU.
- The width between the 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 and rear rails.
To correctly install the switch in a cabinet that is located in a hot-aisle/cold-aisle environment, you should fit the cabinet with baffles to prevent exhaust air from recirculating into the chassis air intake. Work with your cabinet vendors to determine which of their cabinets meet the following requirements or see the Cisco Technical Assistance Center (TAC) for recommendations:

- The height of the rack or cabinet must accommodate the 14-RU (24.5 inches or 62.2 cm) height of the switch and its bottom support bracket.
- Minimum gross load rating of 2000 lb (907.2 kg) (static load rating) if supporting three switches.

### Rack and Cabinet Requirements for the Cisco MDS 9706 Chassis

To correctly install the switch in a cabinet that is located in a hot-aisle/cold-aisle environment, you should fit the cabinet with baffles to prevent exhaust air from recirculating into the chassis air intake. Work with your cabinet vendors to determine which of their cabinets meet the following requirements or see the Cisco Technical Assistance Center (TAC) for recommendations:

- The height of the rack or cabinet must accommodate the 9 RU (15.75 inches or 40.0 cm) height of the switch and its bottom support bracket. The bottom support bracket ships as a part of the accessory kit for the switch.
- Minimum gross load rating of 2000 lb (907.2 kg) (static load rating) if supporting four switches.

### Clearance Requirements for Cisco MDS 9700 Series Directors

You must provide adequate clearance between the chassis and any other rack, device, or structure so that you can properly install the chassis, route cables, provide airflow, and maintain the switch. Ensure that the following clearance requirements are met:

- 7 inches (17.78 cm) between the front of chassis and inside of cabinet.
- 34 inches (86.36 cm) [40 inches recommended (101 cm)] in front of the cabinet so that a fully loaded 34 inches (86.36 cm) chassis box can be moved.
- 2 inches (5.08 cm) for module handles.
- 3 inches (7.62 cm) between the rear of the chassis and the inside of the cabinet, that is, the perforated rear door (required for airflow in the cabinet if used).
- 25 inches (63.5 cm) outside of the cabinet to remove fabric modules.
- No clearance is required between the chassis and the sides of the rack or cabinet (no side airflow).
- Clearance required for cables that connect to as many as 400 ports (in addition to the cabling required for other devices in the same rack). These cables must not block access to any removable chassis modules or block airflow into or out of the chassis. Route the cables through the cable management frames on the left and right sides of the chassis.

*Figure 2-1 illustrates the front, rear, and side clearance requirements for Cisco MDS 9700 Series Directors:*
Chapter 2      Rack Installation

Rack Requirements

Figure 2-1  Clearance Requirements for Cisco MDS 9700 Series Directors (Top View)

Table 2-1  Cisco MDS 9700 Clearance Requirements

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chassis</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Cable Management Frames</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Vertical rack-mount posts and rails</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>Area used for fan tray handles at the rear of the chassis (allow 2 inches [5 cm])</td>
<td>12</td>
</tr>
</tbody>
</table>
Table 2-1  Cisco MDS 9700 Clearance Requirements

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Nearest object or inside of cabinet (no side clearance required)</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>Fibre Channel ports. Air intake from the cold aisle for all modules and power supplies</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>Air exhaust to the hot aisle for all modules and power supplies</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>No left side clearance required (no airflow on left side)</td>
<td></td>
</tr>
</tbody>
</table>

### 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 Installing the Rack-Mount Support Brackets

Before installing the rack-mount support brackets for the Cisco MDS 9700 Series, check the contents of your kit. Table 2-2 lists the contents of the shelf bracket kit.

Table 2-2  Contents of Rack-Mount Support Brackets Kit

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Part Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Bottom support brackets</td>
</tr>
<tr>
<td>20</td>
<td>12-24 x 3/4-in. Phillips screws</td>
</tr>
<tr>
<td>20</td>
<td>M6 x 19 mm Phillips binder-head screws</td>
</tr>
<tr>
<td>20</td>
<td>10-32 x 3/4-inch screws</td>
</tr>
</tbody>
</table>

### 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 2-3 lists the contents of the shelf bracket kit.

Table 2-3  Contents of Shelf Bracket Kit

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Part Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Slider brackets</td>
</tr>
<tr>
<td>2</td>
<td>Shelf brackets</td>
</tr>
<tr>
<td>1</td>
<td>Crossbar</td>
</tr>
<tr>
<td>2</td>
<td>10-32 x 3/8-in. Phillips pan-head screws</td>
</tr>
<tr>
<td>16</td>
<td>12-24 x 3/4-in. Phillips screws</td>
</tr>
<tr>
<td>16</td>
<td>10-24 x 3/4-in. Phillips screws</td>
</tr>
</tbody>
</table>

**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 9700 Series Shelf Bracket Kit into a Rack

Figure 2-2 shows the installation of the Cisco MDS 9700 Series Shelf Bracket Kit into a four-post rack.

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

Step 1  Position a shelf bracket inside the rack-mounting rails. 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 three (M6, 12-32 or 12-24) screws.

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 three (M6, 12-32 or 12-24) screws.

Step 3  Verify that the shelf brackets are at the same height (using the level or tape measure as desired).

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 2-72
- Installing the Switch on the Shelf Brackets, page 2-72
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 “” section on page 2-73.

**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 “Required Tools and Equipment” section on page 3-102.

**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 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 “Required Equipment” section on page 2-70.

The Cisco MDS 9700 Series Shelf Bracket Kit can be used to support the switch in a nonthreaded rack. This shelf bracket kit can be used as a permanent support when installing a Cisco MDS 9700 Series Director in a rack that meets the requirements listed in the “Rack Requirements” section on page 2-65.

**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 shelf brackets, follow these 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 that it is squarely positioned.

Step 3
Attach the Cisco MDS 9700 Series 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 “Required Equipment” section on page 2-70

Caution

We recommend that 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.

Removing the Shelf Bracket Kit

The shelf bracket kit can be removed after the Cisco MDS 9700 Series switch has been installed in a two-post telco (only MDS 9706 Director) or four-post EIA rack, and the front rack-mount brackets are securely attached to the rack-mounting rails. For additional support in an EIA rack, ensure that the C brackets on the Cisco MDS 9710 Switch are attached to the rear rack-mounting rails.

To remove the shelf bracket kit, follow these steps:

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. Then remove the shelf brackets from the rack.