

Rack Installation Guide

Notes, Notices, and Cautions



NOTE: A NOTE indicates important information that helps you make better use of your computer.



NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.



CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

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Safety Instructions


Use the following safety guidelines to ensure your own personal safety and to help protect your system and working environment from potential damage. For complete safety and regulatory information, see the *Product Information Guide* that shipped with your system. Warranty information might be included in this document or as a separate document.

SAFETY: Rack Mounting of Systems


Observe the following precautions for rack stability and safety. Also refer to the rack installation documentation accompanying the system and the rack for specific caution statements and procedures. Systems are considered to be components in a rack. Thus, "component" refers to any system as well as to various peripherals or supporting hardware.

 **CAUTION:** Before installing systems in a rack, install front and side stabilizers on stand-alone racks or the front stabilizer on racks joined to other racks. Failure to install stabilizers accordingly before installing systems in a rack could cause the rack to tip over, potentially resulting in bodily injury under certain circumstances. Therefore, always install the stabilizer(s) before installing components in the rack.

After installing system/components in a rack, never pull more than one component out of the rack on its slide assemblies at one time. The weight of more than one extended component could cause the rack to tip over and may result in serious injury.

 **NOTE:** Your system is safety-certified as a free-standing unit and as a component for use in a Dell rack cabinet using the customer rack kit. The installation of your system and rack kit in any other rack cabinet has not been approved by any safety agencies. It is your responsibility to ensure that the final combination of system and rack complies with all applicable safety standards and local electric code requirements. Dell disclaims all liability and warranties in connection with such combinations.

- System rack kits are intended to be installed in a rack by trained service technicians. If you install the kit in any other rack, be sure that the rack meets the specifications of a Dell rack.

 **CAUTION:** Do not move racks by yourself. Due to the height and weight of the rack, a minimum of two people should accomplish this task.

- Before working on the rack, make sure that the stabilizers are secured to the rack, extended to the floor, and that the full weight of the rack rests on the floor. Install front and side stabilizers on a single rack or front stabilizers for joined multiple racks before working on the rack.
- Always load the rack from the bottom up, and load the heaviest item in the rack first.
- Make sure that the rack is level and stable before extending a component from the rack.
- Use caution when pressing the component rail release latches and sliding a component into or out of a rack; the slide rails can pinch your fingers.
- Do not overload the AC supply branch circuit that provides power to the rack. The total rack load should not exceed 80 percent of the branch circuit rating.
- Ensure that proper airflow is provided to components in the rack.
- Do not step on or stand on any component when servicing other components in a rack.

General Installation Instructions

This installation guide provides instructions for trained service technicians installing one or more systems in a rack cabinet. The RapidRails™ configuration can be installed without tools in manufacturer's rack cabinets that have square holes; the VersaRails™ configuration can be installed in most industry-standard rack cabinets that have square or round holes. One rack kit is required for each system to be installed in the rack cabinet.

Before You Begin

Before you begin installing your system in the rack, carefully read "Safety Instructions" on page 5, as well as the safety instructions found in your *Product Information Guide* for additional information.



CAUTION: When installing multiple systems in a rack, complete all of the procedures for the current system before attempting to install the next system.



CAUTION: Rack cabinets can be extremely heavy and move easily on their casters. They do not have brakes. Use extreme caution while moving the rack cabinet. Retract the leveling feet when relocating the rack cabinet. Avoid long or steep inclines or ramps where loss of cabinet control may occur. Extend the leveling feet for support and to prevent the cabinet from rolling.



NOTE: For instructions on installing the system itself, see "Installing the System in the Rack" on page 15.

Important Safety Information

Observe the safety precautions in the following subsections when installing your system in the rack.



CAUTION: You must strictly follow the procedures in this document to protect yourself as well as others who may be involved. Your system may be very large and heavy and proper preparation and planning are important to prevent injury to yourself and to others. This precaution becomes increasingly important when systems are installed high up in the rack.



CAUTION: Do not install rack kit components designed for another system. Use only the rack kit for your system. Using the rack kit for another system may result in damage to the system and personal injury to yourself and to others.

Rack Requirements for VersaRails



NOTICE: The VersaRails rack kit is intended to be installed by trained service technicians in a rack that meets the specifications of American National Standards Institute (ANSI)/Electronic Industries Association (EIA) standard ANSI/EIA-310-D-92, International Electrotechnical Commission (IEC) 297, and Deutsche Industrie Norm (DIN) 41494. One rack kit is required for each system that is installed in a rack.

Rack Stabilizer Feet

CAUTION: Before installing systems in a rack, install front and side stabilizers on stand-alone racks or the front stabilizer on racks joined to other racks. Failure to install stabilizers accordingly before installing systems in a rack could cause the rack to tip over, potentially resulting in bodily injury under certain circumstances. Therefore, always install the stabilizer(s) before installing components in the rack.

The stabilizer feet help prevent the rack from tipping over. See the documentation provided with the rack cabinet for instructions on installing and anchoring the stabilizer feet.

Recommended Tools and Supplies

You may need the following items to install the system in a four-post rack cabinet:

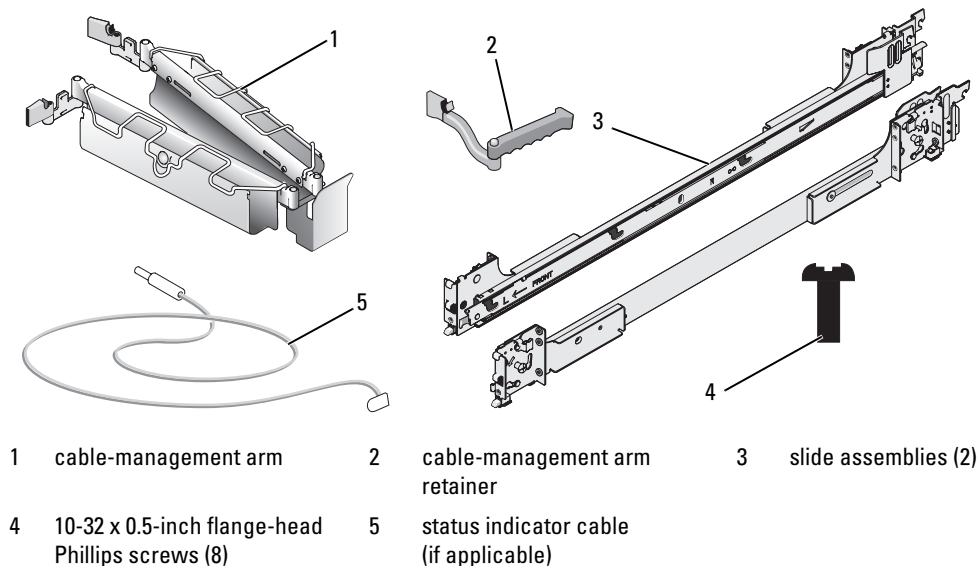
- #2 Phillips screwdriver
- Masking tape or a felt-tip pen, for use in marking the mounting holes to be used

Rack Kit Contents

- One pair of slide assemblies
- One cable-management arm
- One cable-management arm retainer
- One status indicator cable (if applicable)
- Eight 10-32 x 0.5-inch flange-head Phillips screws

NOTE: The nonmetric screws described in illustrations and in procedural steps are identified by size and number of threads per inch. For example, a #10 Phillips-head screw with 32 threads per inch is identified as a 10-32 screw.

Figure 1-1. Rack Kit Contents



Installation Tasks

Installing a rack kit involves performing the following tasks (described in detail in subsequent sections) in their numbered order:

- 1 Removing the rack doors
- 2 Marking the rack
- 3 Configuring the sliding rail assemblies
- 4 Installing the mounting rails in the rack
 - RapidRails installation
 - VersaRails installation
- 5 Installing the system in the rack
- 6 Installing the cable-management arm
- 7 Routing cables
- 8 Attaching the cable-management arm retainer
- 9 Replacing the rack doors

Removing the Rack Doors

See the procedures for removing doors in the documentation provided with your rack cabinet.



CAUTION: Because of the size and weight of the rack cabinet doors, never attempt to remove or install them by yourself.



CAUTION: Store the doors where they will not injure someone if the doors accidentally fall over.

Marking the Rack

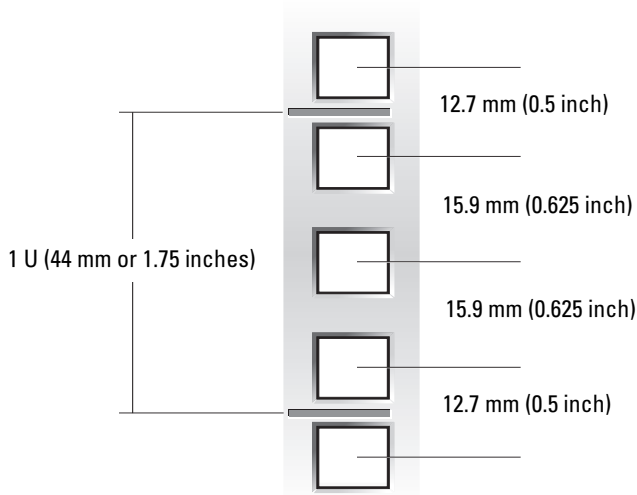
For a 2-U system, you must allow 2 U (88 mm, or 3.5 inches) of vertical space for each system you install in the rack.

Rack cabinets that meet EIA-310 standards have an alternating pattern of three holes per rack unit with center-to-center hole spacing (beginning at the top hole of a 1-U space) of 15.9 mm, 15.9 mm, and 12.7 mm (0.625 inch, 0.625 inch, and 0.5 inch) for the front and back vertical rails (see Figure 1-2). Rack cabinets may have round or square holes.



NOTE: The vertical rails may be marked by horizontal lines and numbers in 1-U increments. If you want, you can make a note of the number marking on the rack's vertical rail. It is not necessary to mark or place tape on the rack.

Figure 1-2. One Rack Unit



⚠ CAUTION: If you are installing more than one system, install the mounting rails so that the first system is installed in the lowest available position in the rack.

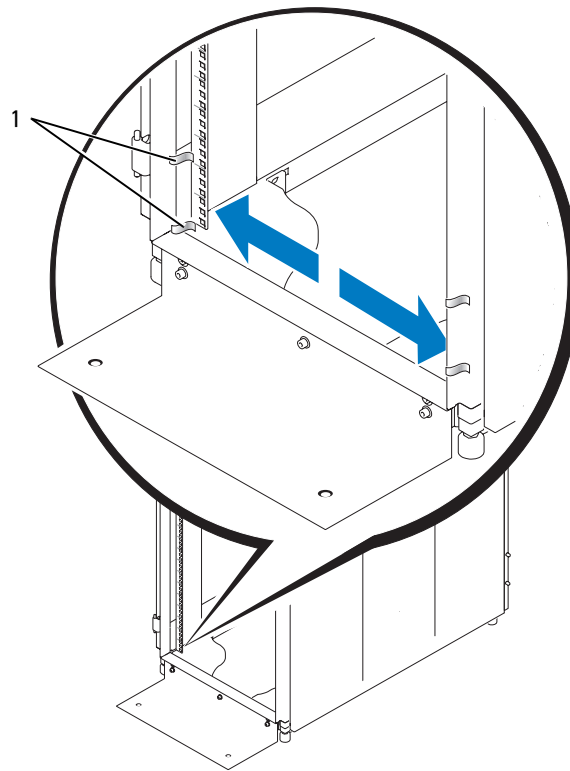
To mark the rack, perform the following steps:

- 1 Place a mark (or tape) on the rack's front vertical rails where you want to locate the bottom of the system you are installing in the rack.

The bottom of each 1-U space is at the middle of the narrowest metal area between holes (marked with a horizontal line on some rack cabinets—see Figure 1-3).

- 2 Place a mark 88 mm (3.5 inches) above the original mark you made (or count up three holes in a rack that meets EIA-310 standards) and mark the rack's front vertical rails with a felt-tipped pen or masking tape (if you counted holes, place a mark just above the top hole). This mark or piece of tape indicates where the system's upper edge will be located on the vertical rails (see Figure 1-3).

Figure 1-3. Marking the Vertical Rails



1 marks on vertical rail (2)

Configuring the Sliding Rail Assemblies

The sliding rail assembly has a rotating mounting bracket at each end of the rail. The position of the bracket determines whether the rail assembly is used as a RapidRail or a VersaRail. The RapidRail side of the bracket has a hook and a latch that secure it to the vertical rail. The VersaRail side of the bracket has three holes and uses screws to attach it to the vertical rail.

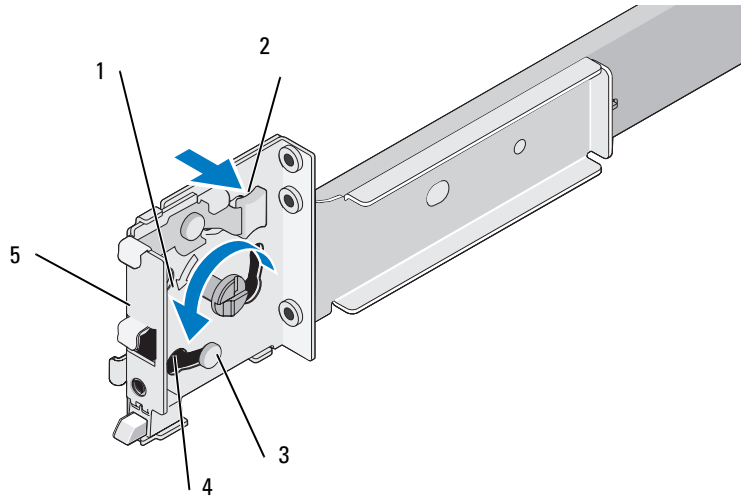


NOTE: The rack kit ships with the slide assemblies in the RapidRails configuration.

To change from one type of rail assembly to the other type of rail assembly:

- 1 Lift the blue lever on the rotating mounting bracket (see Figure 1-4).
- 2 Rotate the bracket and slide it up off of the two shoulder standoffs.
- 3 Continue to rotate the bracket 180 degrees until you can set the notches back over the shoulder standoffs.
- 4 Rotate the bracket in the opposite direction until the bracket clicks into place.

Figure 1-4. Changing the Position of the Rotating Mounting Bracket



- | | | | | | |
|---|------------------|---|---|---|------------------------|
| 1 | rotating bracket | 2 | release lever | 3 | shoulder standoffs (2) |
| 4 | notches (2) | 5 | mounting-bracket flange
(RapidRails version shown) | | |

Installing the Mounting Rails in the Rack

Installing RapidRails Mounting Rails

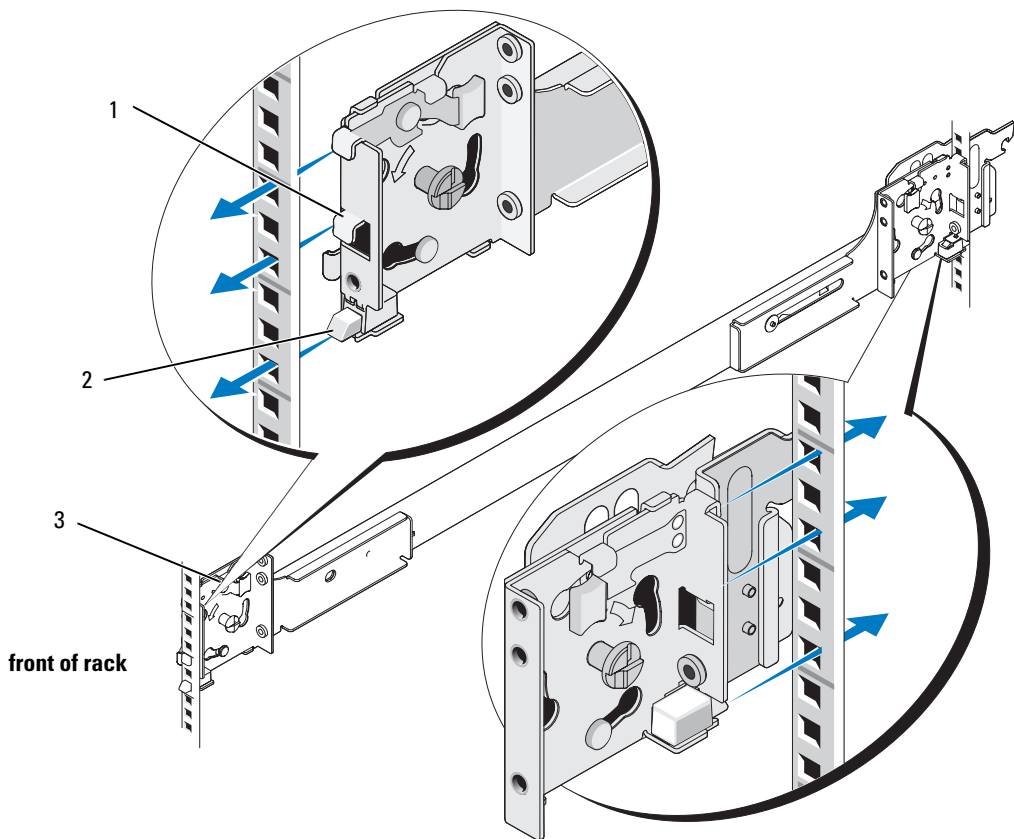


NOTE: Ensure that the rotating mounting brackets on the slide assemblies are in the RapidRail configuration. See Figure 1-5.

- 1 At the front of the rack cabinet, position one of the mounting rails so that its mounting-bracket flange fits between the marks or tape you placed (or numbered locations) on the vertical rails in "Marking the Rack" on page 8 (see Figure 1-5).


The top mounting hook on the front mounting-bracket flange should enter the top hole between the marks you made on the vertical rails.

Figure 1-5. Installing RapidRails Mounting Rails



1 mounting hooks (4) 2 push buttons (2) 3 mounting rails (2)

- 2 Push the mounting rail forward until the mounting hooks enter their square holes, and then push down on the mounting-bracket flange until the mounting hooks seat and the push button pops out and clicks (see Figure 1-5).
- 3 At the back of the cabinet, pull back on the mounting-bracket flange until the mounting hooks enter their square holes, and then push down on the flange until the mounting hooks seat and the push button pops out and clicks.
- 4 Repeat step 1 through step 3 for the mounting rail on the other side of the rack.

 **NOTE:** Ensure that the mounting rails are mounted at the same vertical position on both sides of the rack.

Installing the VersaRails Mounting Rails



NOTE: Ensure that the rotating mounting brackets on the slide assemblies are in the VersaRail configuration. See Figure 1-6.

- 1 At the front of the rack cabinet, position one of the mounting rails so that its mounting-bracket flange fits between the marks you placed (or numbered locations) on the vertical rails in "Marking the Rack" on page 8 (see Figure 1-6).

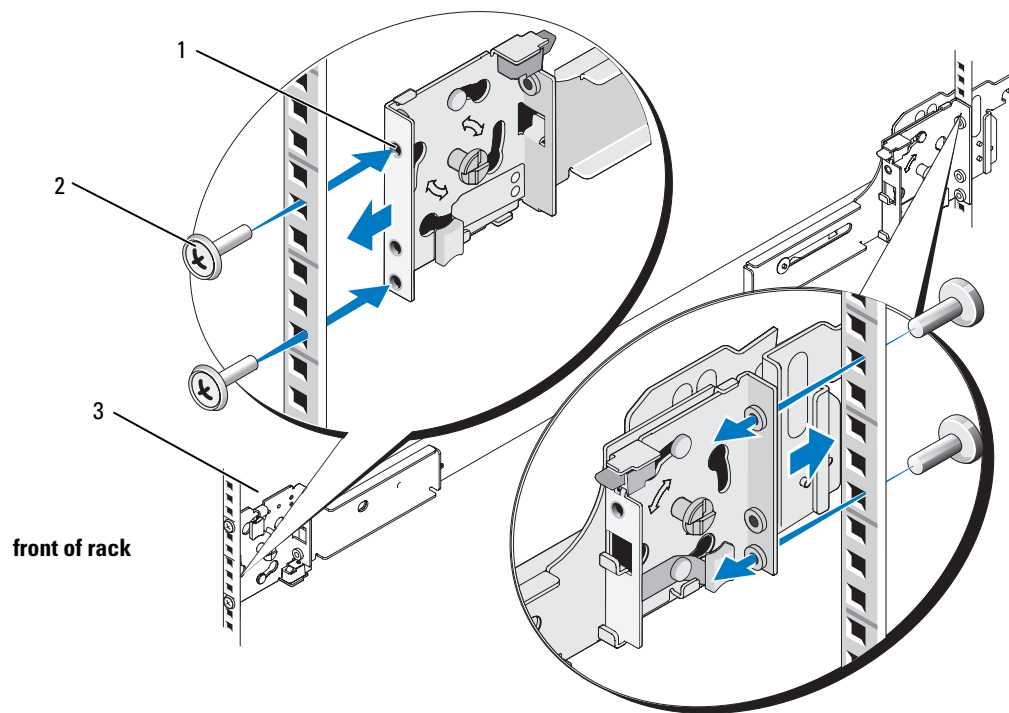
The three holes on the front of the mounting-bracket flange should align with the holes between the marks you made on the front vertical rail.

- 2 Install two 10-32 x 0.5-inch flange-head Phillips screws in the upper and lower holes in the mounting-bracket flange to secure the mounting rail to the front vertical rail.
- 3 At the back of the cabinet, pull back on the mounting-bracket flange until the mounting holes align with their respective holes on the back vertical rail.
- 4 Install two 10-32 x 0.5-inch flange-head Phillips screws in the upper and lower holes in the mounting-bracket flange to secure the mounting rail to the back vertical rail.
- 5 Repeat step 1 through step 4 for the mounting rail on the other side of the rack.



NOTE: Ensure that the mounting rails are mounted at the same position on the vertical rails on each side of the rack.

Figure 1-6. Installing VersaRails Mounting Rails



- | | | | | | |
|---|-------------------------|---|--|---|--------------------|
| 1 | mounting-bracket flange | 2 | 10-32 x 0.5-inch flange-head Phillips screws (4 per mounting rail) | 3 | mounting rails (2) |
|---|-------------------------|---|--|---|--------------------|

Installing the System in the Rack



CAUTION: If you are installing more than one system, install the first system in the lowest available position in the rack.



CAUTION: Because of the size and weight of the system, never attempt to install the system in the mounting rails by yourself.

- 1 Pull the two inner slide rails out of the rack until they lock in the fully extended position.
- 2 Lift the system into position above the extended slides.

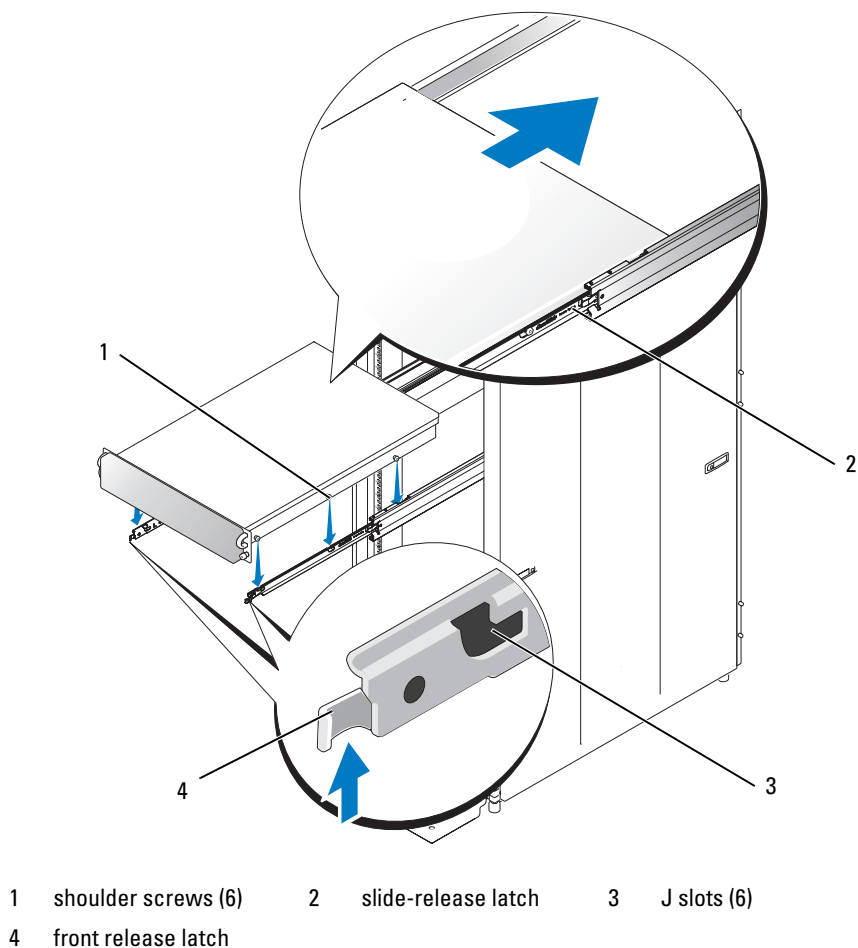
The three shoulder screws on the sides of the system fit into the corresponding J-slots (see detail on Figure 1-7) on the inner slide assemblies.

- 3 Lower the back of the system while aligning the back shoulder screws on the sides of the system with the back J-slots on the slide assemblies.
- 4 Engage the back shoulder screws into their respective J-slots.
- 5 Lower the front of the system and fit the middle and front shoulder screws into the J-slots in the slide assemblies.

The system release latch at the front of the inner slide rail will snap back as the shoulder screw passes into the front slot. Use this system release latch when you wish to remove the system from the slide assemblies.

- 6 Press the slide-release latch on the outside of each inner slide, then push the system into the rack.
- 7 Install the cable-management arm. See "Installing the Cable-Management Arm" on page 17.
- 8 Tighten the thumbscrews on the rack front panel to secure the slide assemblies to the rack.

Figure 1-7. Installing the System in the Rack



Removing the System From the Rack

To remove the system from the rack, perform the following procedure:

- 1 Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
- 2 Remove the I/O cable connectors and power cable connectors from their respective connectors on the system back panel.
- 3 Loosen the thumbscrews on each side of the front chassis panel that secures the system to the rack.
- 4 Pull the system out of the rack until it stops because of the safety catch.

- 5 Pull up on the front release latch on each rail to disengage the safety catch (see Figure 1-7) and slide the system forward.
- 6 Pull the system completely out of the rack.

Installing the Cable-Management Arm




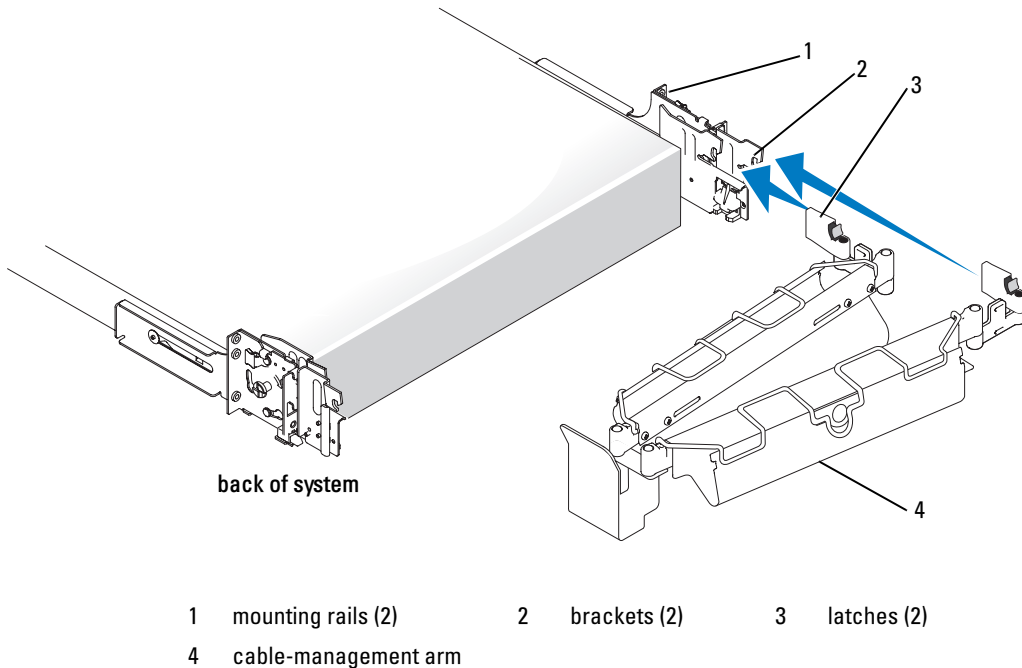
-  **NOTE:** You can attach the cable-management arm to either side of the rack cabinet.
-  **NOTE:** Attach the cable-management arm retainer to the side opposite of where you attach the cable-management arm.
- 1 Fit the latch on the front end of the cable-management arm onto the bracket on the end of the mounting rail until the latch clicks (see Figure 1-8).
- 2 Fit the latch on the unattached end of the cable-management arm onto the bracket on the end of the slide assembly until the latch clicks (see Figure 1-8).
-  **NOTE:** Both ends of the cable-management arm must be connected before you begin routing the system cables.

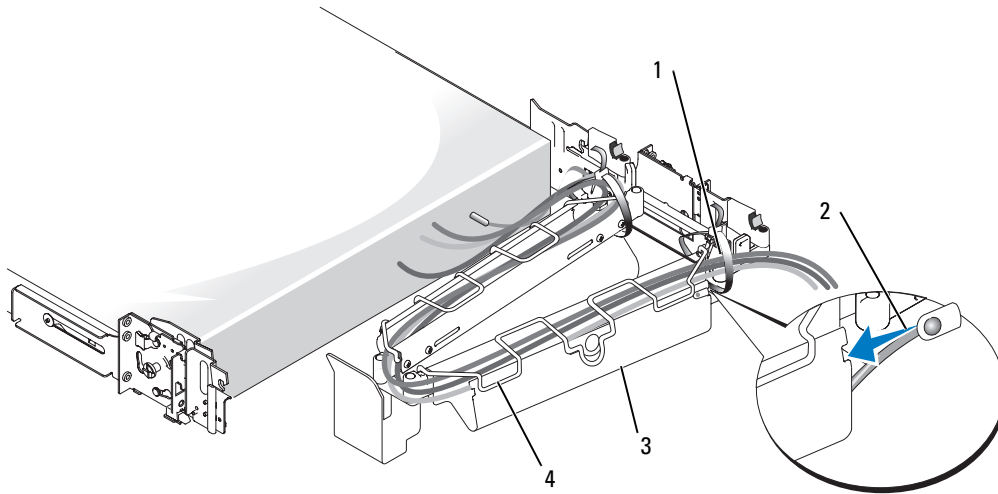
Figure 1-8. Installing the Cable-Management Arm




Routing Cables


- 1 Open the wire cable basket on the top of the cable-management arm, to enable cables to be routed within the arms (see Figure 1-9).

Figure 1-9. Routing Cables on the Cable-Management Arm




- | | | | | | |
|---|-------------------|---|-------------------------------|---|----------------------|
| 1 | tie wraps (2) | 2 | system status-indicator cable | 3 | cable-management arm |
| | | | connector | | |
| 4 | wire cable basket | | | | |

- 2 If applicable, connect the system status-indicator cable to its connector on the system back panel. Route the system status-indicator cable through the cable-management arm, and press the LED end into the slot on the end of the cable-management arm until it snaps into place.
 - 3 Attach the I/O cable connectors and power cable connectors to their respective connectors on the system back panel.
For details on cable connections, see your system's *Getting Started Guide* or *Hardware Owner's Manual*.
-  **NOTE:** Use the retainer brackets on the back of the power supplies to provide strain relief for the power cables.
- 4 Route the cables along the bend in the cable-management arm.
 - 5 Adjust the cable slack as needed at the hinge position and secure the cables with the tie wraps (see Figure 1-9).

- 6 Close the cable basket.
- 7 Slide the system in and out of the rack to verify that the cables are routed correctly and do not bind, stretch, or interfere with the movement of the cable-management arm. Adjust the cable positioning inside the cable management arm as needed.
 -  **NOTE:** If you pull the system out to its furthest extension, the slide assemblies will lock in the extended position. To release the lock, press the slide release latch on the side of each slide and then slide the system into the rack.
- 8 When you are satisfied that the cables are routed correctly, push the system fully into the rack.

Attaching the Cable-Management Arm Retainer

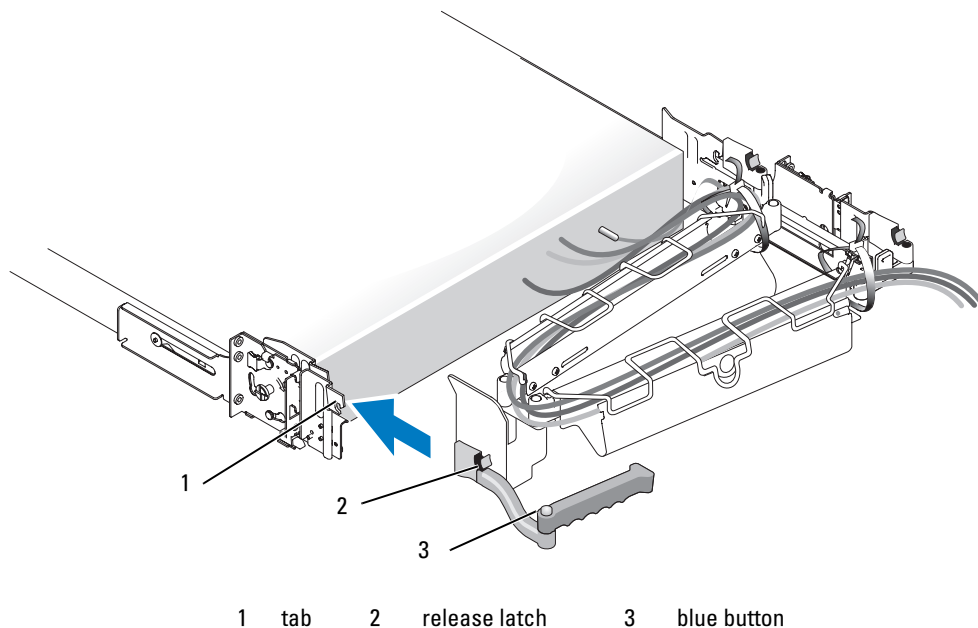
The cable-management arm retainer keeps the cable-management arm in place. To attach the cable-management arm retainer:

- 1 Connect the release latch on the cable-management arm retainer to the tab on the outer slide assembly (see Figure 1-10).
 -  **NOTE:** Attach the cable-management arm retainer to the side opposite of where you attach the cable-management arm.
- 2 Fold the cable-management arm retainer until it locks into place behind the cable-management arm.

To unlock the cable-management arm retainer:

- 1 Press the blue button on the cable-management arm retainer while lifting the retainer arm.
- 2 Rotate the arm of the retainer to an open position.

Figure 1-10. Installing the Cable-Management Arm Retainer



Replacing the Rack Doors

See the procedures for replacing doors in the documentation provided with your rack.

CAUTION: Because of the size and weight of the rack cabinet doors, never attempt to remove or install them by yourself.