

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 information, see the *Product Information Guide*.

SAFETY: Rack Mounting of Systems

Observe the following precautions for rack stability and safety.

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: Installing systems in a rack without the front and side stabilizers installed could cause the rack to tip over, potentially resulting in bodily injury under certain circumstances. Therefore, always install the stabilizers 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 injure someone.



NOTE: Your system is safety-certified as a free-standing unit and as a component for use in a rack cabinet using the customer rack kit when both the rack cabinet and rack kit were designed for your system. 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 have the final combination of system and rack kit in a cabinet evaluated for suitability by a certified safety agency. The manufacturer disclaims all warranties and liability in connection with such combinations.

- System rack kits are intended to be installed in an approved rack by trained service technicians. If you install the kit in any other rack, be sure that the rack meets the specifications.
- 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.
- After a component is inserted into the rack, carefully extend the rail into a locking position, and then slide the component into the rack.
- Do not overload the AC power 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 system/component when servicing other components in a rack.

Installation Instructions

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



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



NOTE: If your system is a tower version, you must install a tower-to-rack conversion kit. Instructions for installing this kit are included in a separate document.

The RapidRails rack kit can be installed in most industry-standard rack cabinets.



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.

Before You Begin

Before you begin installing your system in the rack, carefully read the safety instructions found at the beginning of this guide, as well as the safety instructions found in your system's *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 the casters. The cabinet has no 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.

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 becomes increasingly important when systems are installed high up in the rack.

Rack Stabilizer Feet



CAUTION: Installing systems in a rack without the front and side stabilizer feet installed could cause the rack to tip over, potentially resulting in bodily injury under certain circumstances. Therefore, always install the stabilizer feet before installing components in the rack.



CAUTION: After installing systems in a rack, never pull more than one system out of the rack on its slide assemblies at one time. The weight of more than one extended system could cause the rack to tip over and cause injury.

The stabilizer feet help prevent the rack from tipping over when a system or other component is pulled out of the rack with the slide assemblies fully extended. See the documentation provided with the rack cabinet for instructions on installing and anchoring the stabilizer feet.

Installation Tasks

Installing a rack kit involves performing the following tasks in their numbered order:

- 1 Removing the rack doors
- 2 Marking the rack (if necessary)
- 3 Installing the rail assemblies in the rack:
 - RapidRails installation
 - VersaRails installation
- 4 Installing the system in the rack
- 5 Installing the cable-management arm
- 6 Routing cables
- 7 Replacing the rack doors

Recommended Tools and Supplies

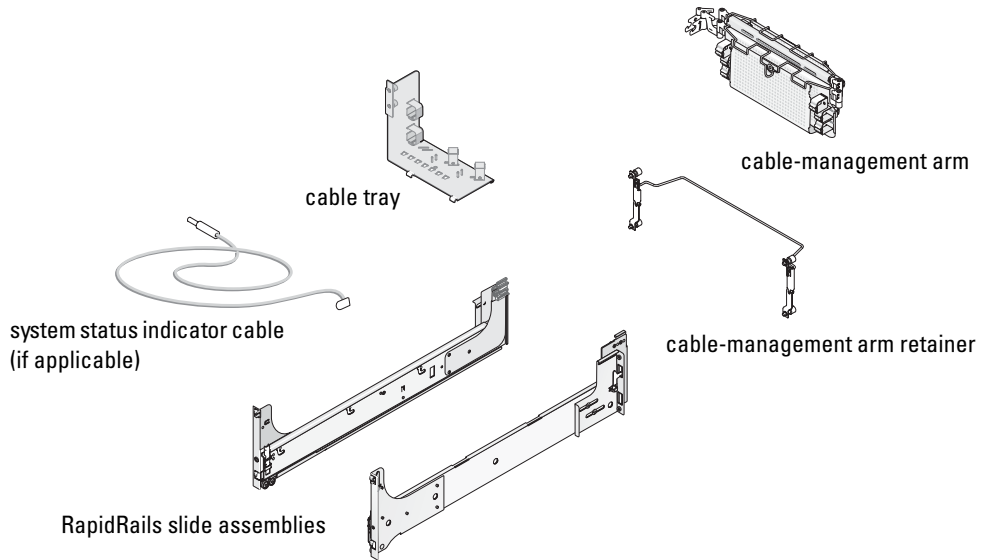
- A #2 Phillips screwdriver
- A T-10 Torx driver (if installing the tower-to-rack kit)
- Masking tape or a felt-tip pen, for use in marking the mounting holes to be used
- A measuring ruler or tape measure

RapidRails Rack Kit Contents

The RapidRails rack kit includes the following items (see Figure 1-1):

- One pair of RapidRails slide assemblies
- One cable-management arm
- One cable-management arm retainer
- One cable tray

Figure 1-1. RapidRails Rack Kit Contents



VersaRails Rack Kit Contents

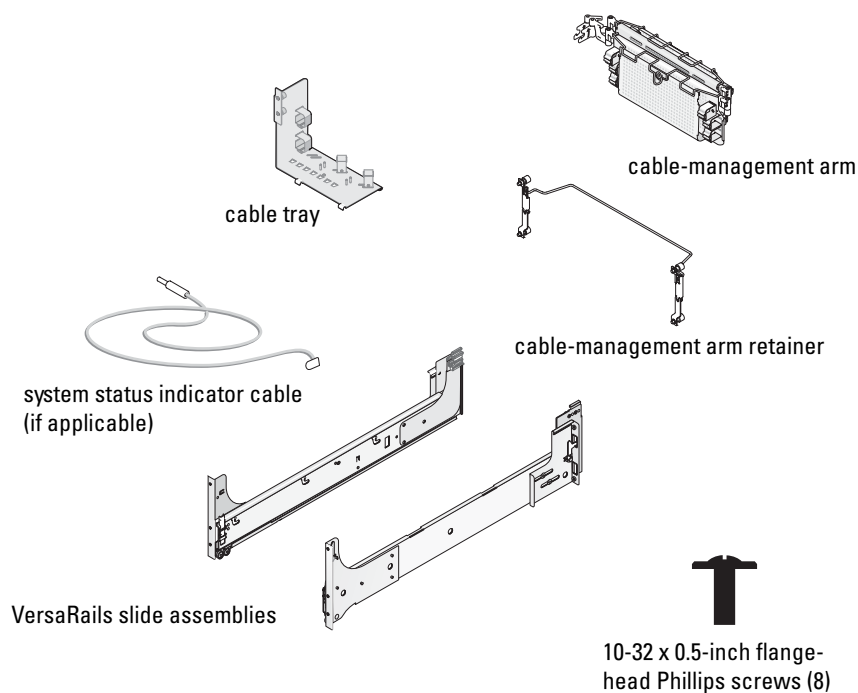
The VersaRails rack kit includes the following items (see Figure 1-2):

- One pair of VersaRails slide assemblies
- One cable-management arm
- One cable-management arm retainer
- One cable tray
- 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 1-2. VersaRails Rack Kit Contents




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.

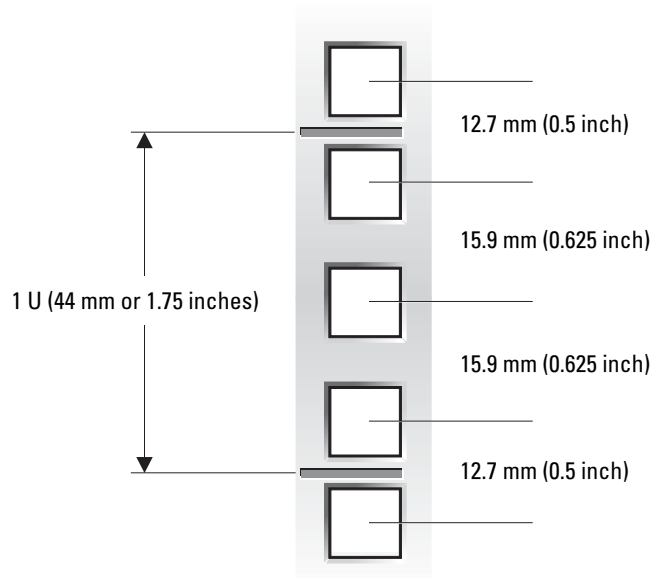
CAUTION: Store the two doors where they will not injure someone if the doors accidentally fall over.


Marking the Rack

 **NOTE:** Your rack may already be marked and not require this procedure.

You must allow 5 U (8.75 inches) of vertical space for each system you install in the rack (see Figure 1-3).

Figure 1-3. One Rack Unit

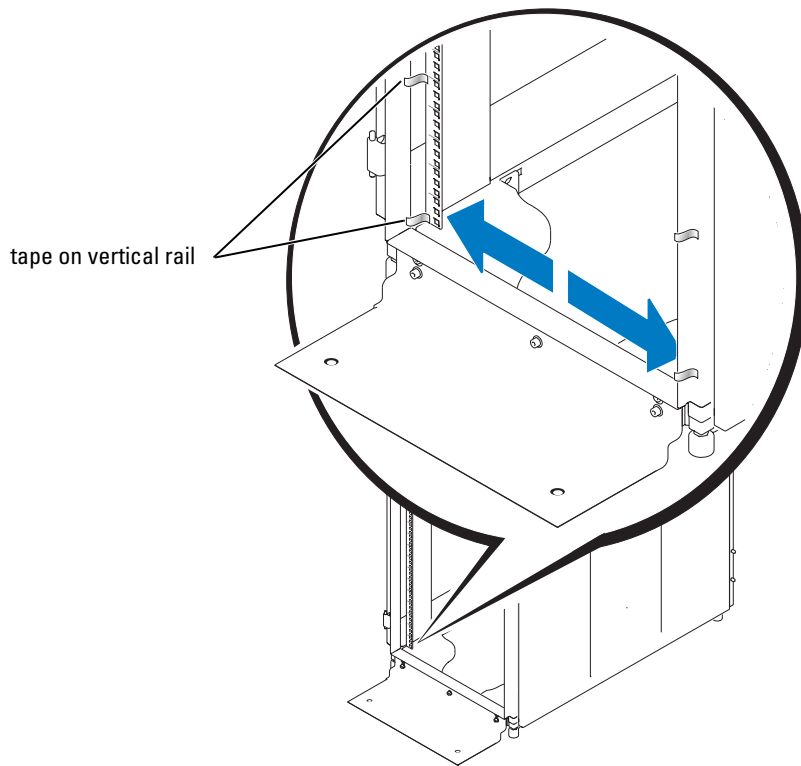


 **CAUTION:** If you are installing more than one system, install the slide assemblies so that the first system is installed in the lowest available position in the rack.

To mark the rack, perform the following steps:

- 1 Place a mark on the rack's front vertical rails where you want to locate the bottom of the system you are installing in the rack cabinet.
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 1-4).
- 2 Place a mark approximately 8.75 inches above the original mark you made (or count up 15 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 1-4).

Figure 1-4. Marking the Vertical Rails



Installing the RapidRails Slide Assemblies

- 1 At the front of the rack cabinet, position one of the RapidRails slide assemblies so that its mounting-bracket flange fits in the appropriate location on the rack (see Figure 1-5). The top mounting hook on the rail assembly's front-mounting bracket flange should enter the top hole between the marks on the vertical rails.
- 2 Push the slide assembly forward until the top mounting hook enters the square hole just below the upper marks or tape you placed on the vertical rail. Next, push down on the mounting-bracket flange until the mounting hooks seat in the square holes 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 are in the appropriate hole, and then push down on the flange until the mounting hooks seat in the square holes and the push button pops out and clicks.

- 4 Repeat steps 1 through 3 for the slide assembly on the other side of the rack.


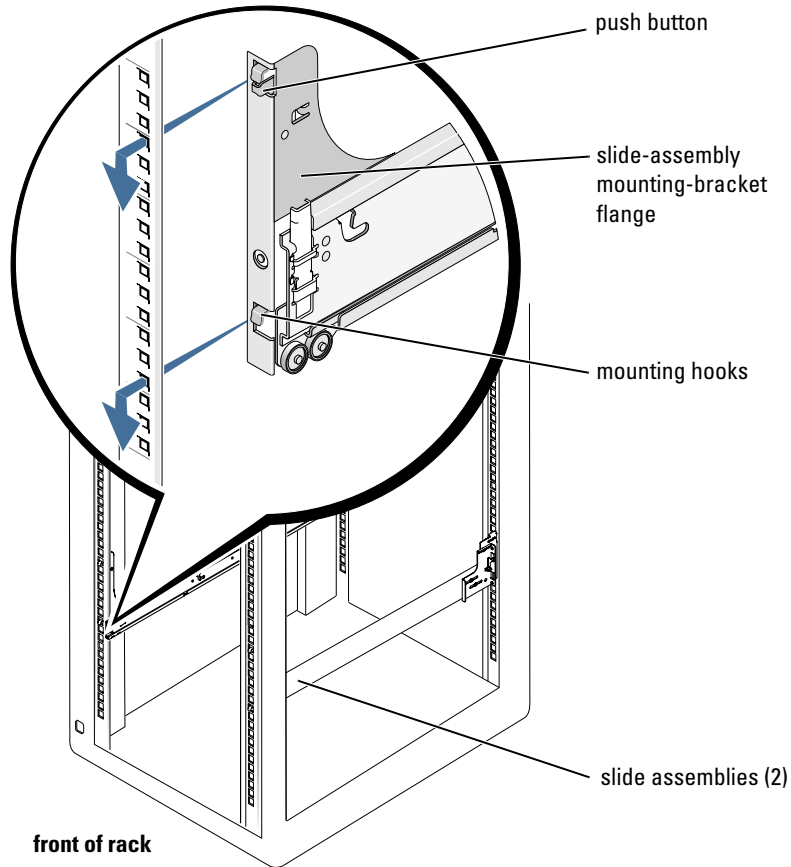
 **NOTE:** Ensure that the rails are mounted at the same vertical position on both sides of the rack.

Figure 1-5. Installing the RapidRails Slide Assemblies



Installing the VersaRails Slide Assemblies

- 1 At the front of the rack cabinet, place a VersaRails slide assembly so that its mounting-bracket flange fits between the marks or tape (or numbered location) on the rack (see Figure 1-6).
The holes on the front of the mounting bracket should align with the holes between the marks on the front vertical rail.
- 2 Install two 10-32 x 0.5-inch flange-head Phillips screws in the mounting flange's top hole and the bottom hole (see Figure 1-6).

- 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 back mounting flange's first and third holes to secure the slide assembly to the back vertical rail.
- 5 Repeat steps 1 through 4 for the slide assembly on the other side of the rack.


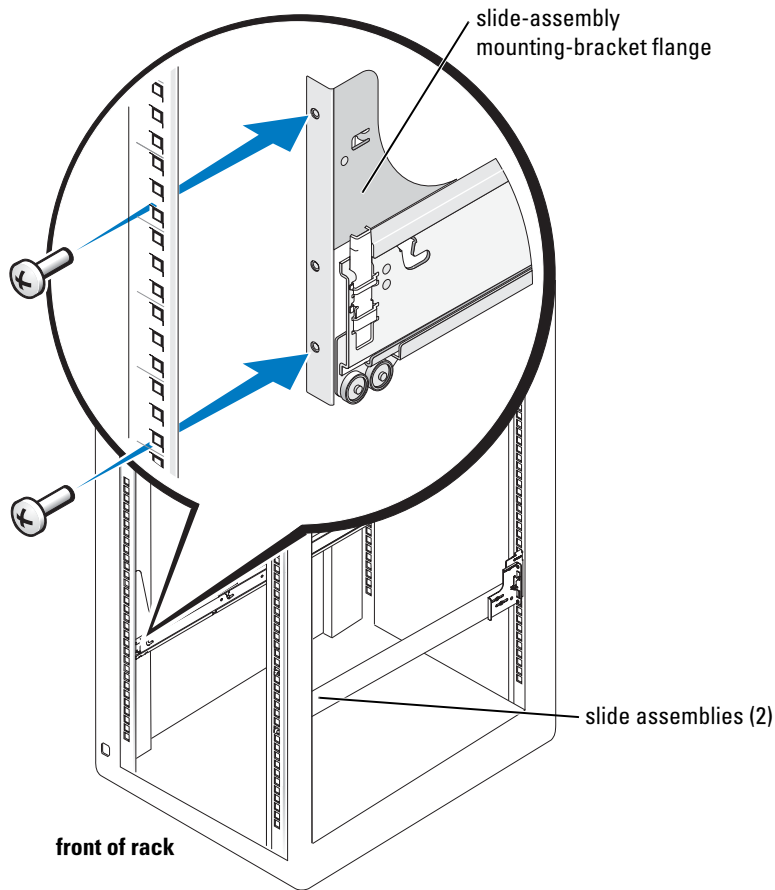
 **NOTE:** Ensure that the rails are mounted at the same vertical position on both sides of the rack.

Figure 1-6. Installing the VersaRails Rail Assemblies



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: Never pull more than one component out of the rack at a time.

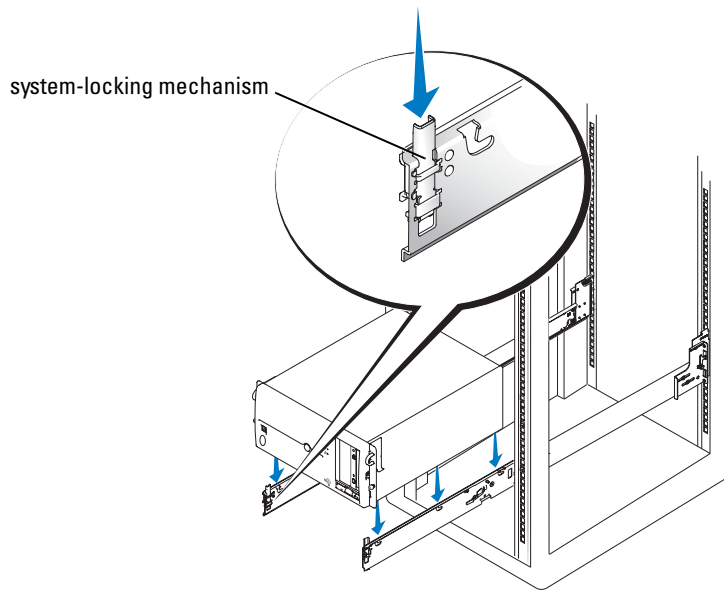
- 1 Pull the two interior slide assemblies out of the rack until they lock in the fully-extended position.



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

- 2 Lift the system into position.
Using a minimum of two persons, each person should place one hand on the front-bottom of the system and the other hand on the back-bottom of the system.
- 3 Tilt the front of the system upward while aligning the back shoulder screws on the sides of the system with the back slots on the slide assemblies (see Figure 1-7).
- 4 Engage the back shoulder screws in the slot just behind the slide-release latch, followed by the middle and front shoulder screws.
- 5 Push the system inward on the slide assemblies until the system locking mechanism clicks into place, locking the slide to the system (see Figure 1-7).
- 6 Pull up on the slide-release latches and push the system into the rack.
- 7 Tighten the thumbscrews on the rack front panel.

Figure 1-7. Installing the System in the Rack



Installing the Cable-Management Arm

This procedure is performed in two phases. First, install the cable tray into the back of the system chassis. Next, install the cable-management arm on either side of the cable tray.

Installing the Cable Tray

Attach the cable tray to the system chassis using four of the metal tabs at the bottom of the tray and two 6-32 x 0.25-inch hex-head Phillips screws (see Figure 1-8).

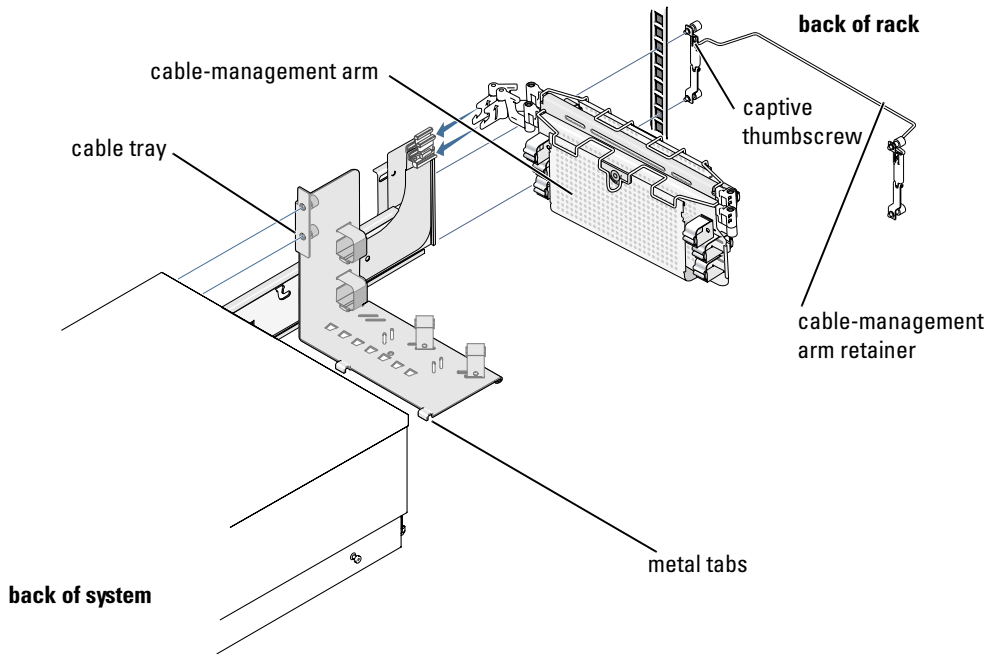


CAUTION: The cable tray cannot support the weight of the system. Do not grasp the cable tray when lifting the system. Lift the system only by the chassis edges.

Securing the Cable-Management Arm

- 1 Facing the back of the rack cabinet, locate the tab on the end of the slide assembly (see Figure 1-8).

Figure 1-8. Installing the Cable-Management Arm



- 2** Push the tab on the back end of the cable-management arm into the latch on the end of the slide assembly (see Figure 1-8).
The latch clicks when locked.
- 3** Push the tab on the front end of the cable-management arm into a matching latch on the inner segment of the slide assembly (see Figure 1-8).
The latch clicks when locked.
- 4** Install the system status indicator cable plug into its connector (see Figure 1-9).
- 5** Open the wire covers on the cable-management arm by lifting the center of the wire over the top of the embossed round button on the front of the forward part of the arm and lifting the wire over the top of a similar round button on the back part of the arm.
The wire cover swings open to enable cables to be routed within the arm.
- 6** Route the system status indicator end of the cable through the cable-management arm, and install the indicator in its slot at the back end of the cable-management arm (see Figure 1-9).

- 7 Connect the power cables to their receptacles on the system back panel.


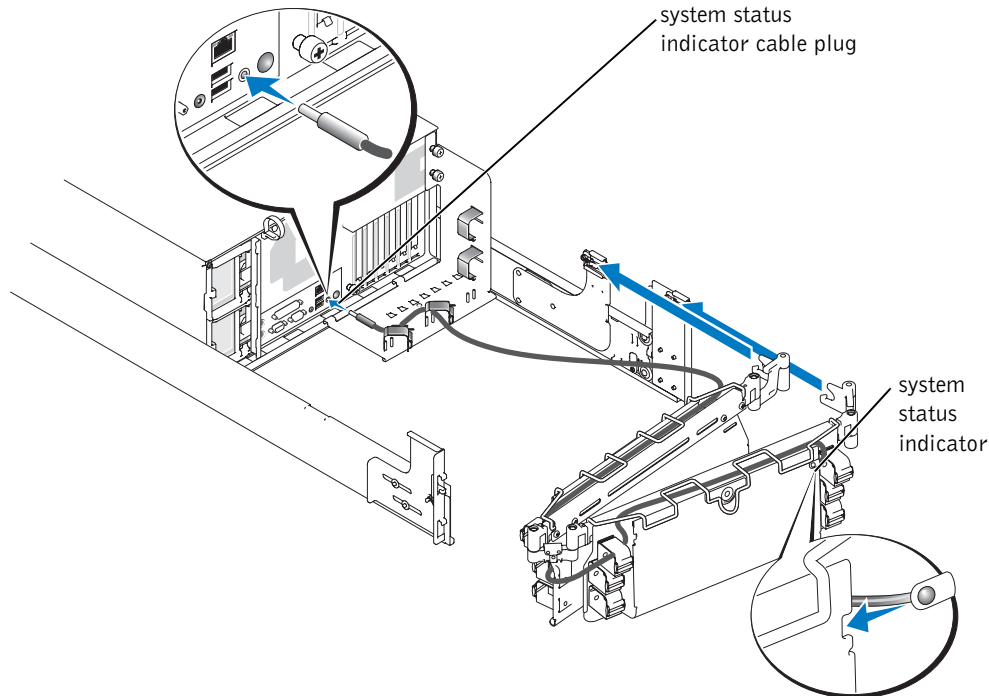

 **NOTE:** Use the strain-relief loop (if available) on the back of the system to provide strain relief for the power cables.

Figure 1-9. Installing the System Status Indicator Cable (If Applicable)



- 8 Connect the power cords to their receptacles on the back panel (see Figure 1-10).

 **CAUTION:** Allow some slack in each cable as you route them around hinges in the cable-management arm.

- 9 Attach the I/O cable connectors to their respective connectors on the system back panel.
- 10 Attach the I/O cable connectors to their respective connectors on the system back panel.
For details on cable connections, see your system's *Installation and Troubleshooting Guide* and your *User's Guide*.
- 11 Route the power and I/O cables through the cable-management arm, using four loosely secured tie-wraps (two in the middle and one on each end of the cable-management arm). Do not fully tighten the tie-wraps at this time (see Figure 1-10).

Allow some cable slack in the cable-management arm to prevent damage to the cables.

12 Secure the cables to the cable-management arm:

- a** After connecting the cables to the system, unscrew the thumbscrews that secure the front of the system to the front vertical rail.
- b** Slide the system forward to the fully extended position.
- c** Route the cables along the cable-management arm, make any adjustments needed to the cable slack at the hinge positions, secure the cables to the cable-management arm with the straps, and close the wire covers over the cable-management arm.


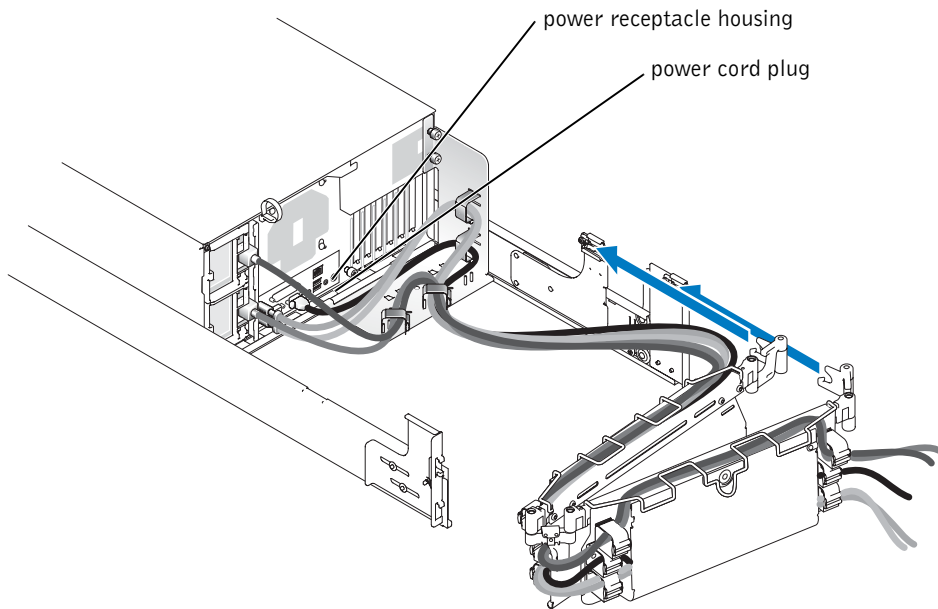
 **NOTE:** As you pull the system out to its furthest extension, the slide assemblies will lock in the extended position. To push the system back into the rack, press the slide release latch on the side of the slide, and then slide the system completely into the rack.

Figure 1-10. Routing the Power Cords



- 13** Slide the system in and out of the rack to verify that the cables are routed correctly and do not bind, stretch, or pinch with the movement of the cable-management arm.
- 14** Open the wire cover of the cable-management arm and tighten the straps just enough to ensure that the cable slack is neither too tight to cause excessive pinching nor too loose, yet keep the cables from slipping as the system is moved in and out of the rack.
- 15** Secure the cable-management arm retainer to the back of the rack using the captive thumbscrews (see Figure 1-8).

Replacing the Rack Doors

See the procedures for replacing doors in the documentation provided with your 24-U and 42-U rack cabinets.

This completes the rack installation of your system.

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