Dell™ Systems

2-Post Rack Installation

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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⚠ CAUTION: Safety Instructions

Use the following safety guidelines to help ensure your own personal safety and to help protect your system and working environment from potential damage. For complete safety information, see the *System Information Guide*.

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 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.

⚠ CAUTION: Safety Instructions *(continued)*

- 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 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.

Installation Instructions

This installation guide provides instructions for trained service technicians installing one or more systems in an open-frame relay rack. One rack kit is required for each system to be installed in the rack cabinet.

This guide includes procedures for the two-post kit (installed in either center-mount or flush-mount configuration, for 3- or 6-inch-wide racks)

For ease in troubleshooting and the identification of system health, this rack kit includes a status-indicator cable that extends the information on the two-color status indicators on the front and back panels to the back of the cable-management arm. For more information on these indicators, see your system *User's Guide*.

Before attempting this installation, you should read through this entire document carefully.

⚠ **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.**

Two-Post Rack Installation

The two-post rack kit is used to install a system in a two-post, open-frame relay rack, such as those found in telecommunications equipment facilities. Both 3-inch and 6-inch wide two-post racks with universal-hole spacing or wide-hole spacing are accommodated. You can install this kit in a center-mount or a flush-mount configuration. The two-post kit incorporates slide assemblies that enable the system to be pulled out of the rack for servicing.

You must properly secure the two-post, open-frame relay rack to the floor, the ceiling or upper wall, and where applicable, to adjacent racks, using floor and wall fasteners and bracing specified or approved by the rack manufacturer or by industry standards. See the two-post, open-frame relay rack manufacturer's installation documentation for precautionary warnings before attempting this installation.

⚠ **CAUTION: Do not attempt to install the system into a two-post, open-frame relay rack that has not been securely anchored in place. Damage to the system and personal injury to yourself and to others may result.**

See "CAUTION: Safety Instructions" at the front of this document for additional safety information regarding rack installation.

Recommended Tools and Supplies

You need the following tools and supplies to install the system in a two-post open-frame relay rack:

- #2 Phillips screwdriver
- 11/32-inch wrench or nut driver (if changing to a flush-mount configuration)
- Masking tape or felt-tip pen to mark the mounting holes

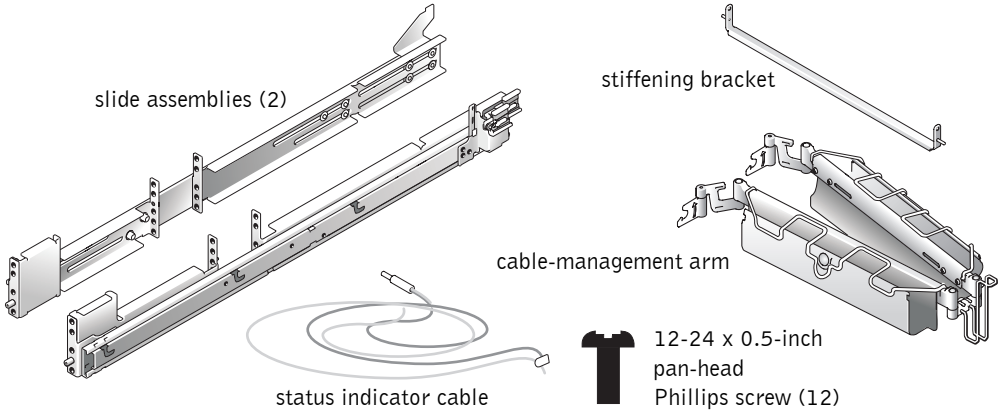
Rack Kit Contents

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

- One pair of slide assemblies (two-post)
- One stiffening bracket
- One cable-management arm
- One status indicator cable

- +Twelve 12-24 x 0.5-inch pan-head Phillips screws
- Tie-wraps (not shown in Figure 1-1)

Figure 1-1. Two-Post Rack Kit Components



Two-Post Rack Installation Tasks

Installing a two-post rack kit includes performing the following tasks in their numbered order:

1. Marking the rack
2. Installing the slide assemblies in the rack:
   - Center-mount installation
   - Flush-mount installation
3. Installing the system in the rack
4. Installing the cable-management arm
5. Routing cables

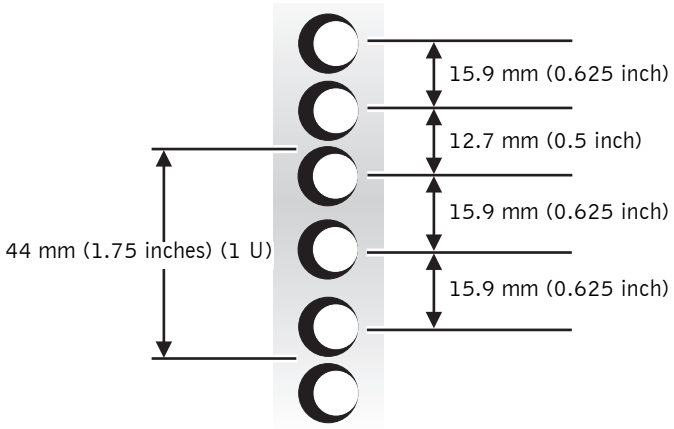
Marking the Rack

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

Universal-Hole Spacing Racks

Industry-standard two-post racks with universal-hole spacing have an alternating pattern of three holes per U 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 column of holes (see Figure 1-2).

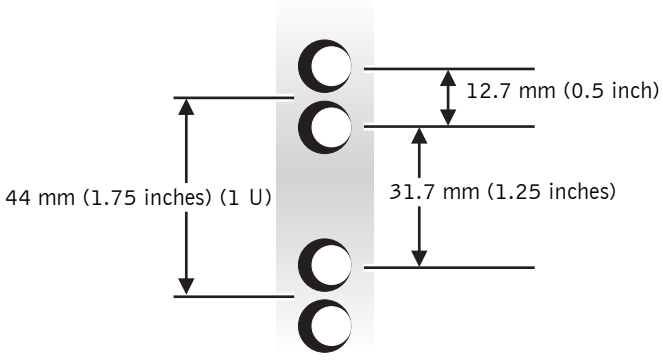
Figure 1-2. Two-Post, Open-Frame Relay Rack Universal-Hole Spacing



Wide-Hole Spacing Racks

Some two-post racks with wide-hole spacing have an alternating pattern of two holes per U with center-to-center hole spacing (beginning at the top hole of a 1-U space) of 31.7 mm and 12.7 mm (1.25 inches and 0.5 inch) for the front and back vertical column of holes (see Figure 1-3).

Figure 1-3. Two-Post, Open-Frame Relay Rack Wide-Hole Spacing



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 two-post rack.

   The bottom of each 1-U space is at the middle of the narrowest metal area between holes.

NOTE: If your rack has wide-hole spacing, go to step 3.

2. Place a mark 88 mm (3.5 inches) above the original mark you made (or count up six holes in a rack with universal-hole spacing (see Figure 1-2).

   Each 1-U (44 mm, or 1.75 inches) of vertical space on a rack with universal-hole spacing has three holes with center-to-center spacing between holes (beginning at the top of a 1-U space) of 0.625, 0.625, and 0.5 inches (see Figure 1-2).

NOTE: If your rack has universal-hole spacing, you have completed the procedure for marking the rack.

3. Place a mark 88 mm (3.5 inches) above the original mark you made (or count up to the fourth hole in the rack with wide-hole spacing (see Figure 1-3).

   Each 1-U (44 mm, or 1.75 inches) of vertical space on a rack with wide-hole spacing has two holes with center-to-center spacing between holes (beginning at the top of a 1-U space) of 31.7 mm (1.25 inches) (see Figure 1-3).

Installing the Slide Assemblies in the Rack

You can install the slide assemblies in a two-post open-frame rack having either universal-hole spacing (see Figure 1-2) or wide-hole spacing (see Figure 1-3). You can install the 2-U slide assemblies in either a flush-mount or center-mount configuration.

CAUTION: Do not attempt to install another system using this rack kit. Use only the rack kit intended 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.

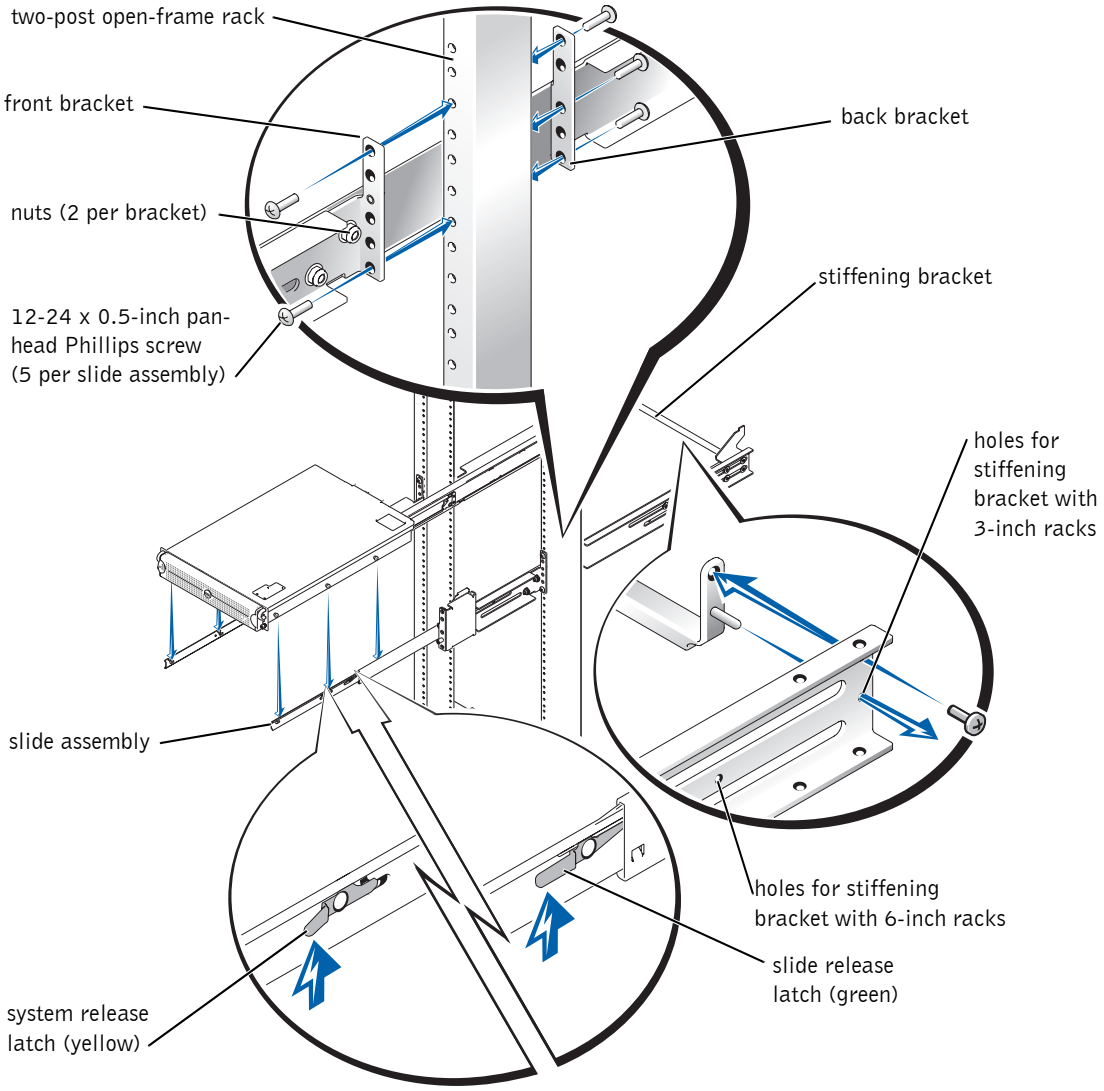
Center-Mount Installation

The two-post rack kit is shipped with the brackets configured for center-mount installation. To complete the installation, perform the following steps:

1. Locate the right slide assembly and push the back bracket toward the back of the slide assembly (see Figure 1-4).
2. Position the right slide assembly in the two-post rack at the location you marked, push the back bracket forward against the vertical two-post rack, secure the front center-mounting bracket with two 12-24 x 0.5-inch pan-head Phillips screws, and secure the back center-mounting bracket to the rack with three 12-24 x 0.5-inch pan-head Phillips screws (see Figure 1-4).
3. Repeat steps 1 and 2 to install the left slide assembly in the rack.
4. Install the stiffening bracket into the appropriate holes at the back of the slide assemblies and secure the bracket with a 12-24 0.5-inch pan-head Phillips screw on each slide assembly (see Figure 1-4).

   If the vertical rack is 3 inches wide, use the holes at the back end of the slide assemblies (shown in Figure 1-4). If the vertical rack is 6 inches wide, use the holes located 3 inches in front of the holes at the back end of the slide assemblies.

Figure 1-4. Installing the Slide Assemblies for Center-Mount Configuration



Flush-Mount Installation

The two-post rack kit is shipped with the brackets configured for center-mount installation. To prepare the slide assemblies for flush-mount installation in the two-post rack, perform the following steps:

1. Locate the two slide assemblies and place them, side by side, on a smooth work surface, with the front ends of the slide assemblies toward you. Position both slide assemblies so that the center brackets are facing upward (see Figure 1-5).

   NOTE: To prepare the slides for flush-mount installation, remove the front mounting bracket, rotate it 180 degrees, and reinstall it on the opposite slide assembly.

2. Using a #2 Phillips screwdriver and an 11/32-inch wrench or nut driver, remove two 12-24 x 0.5-inch pan-head Phillips screws, two nuts, and two shoulder washers from each front center bracket (see Figure 1-5).

3. Remove the front bracket from both slide assemblies.

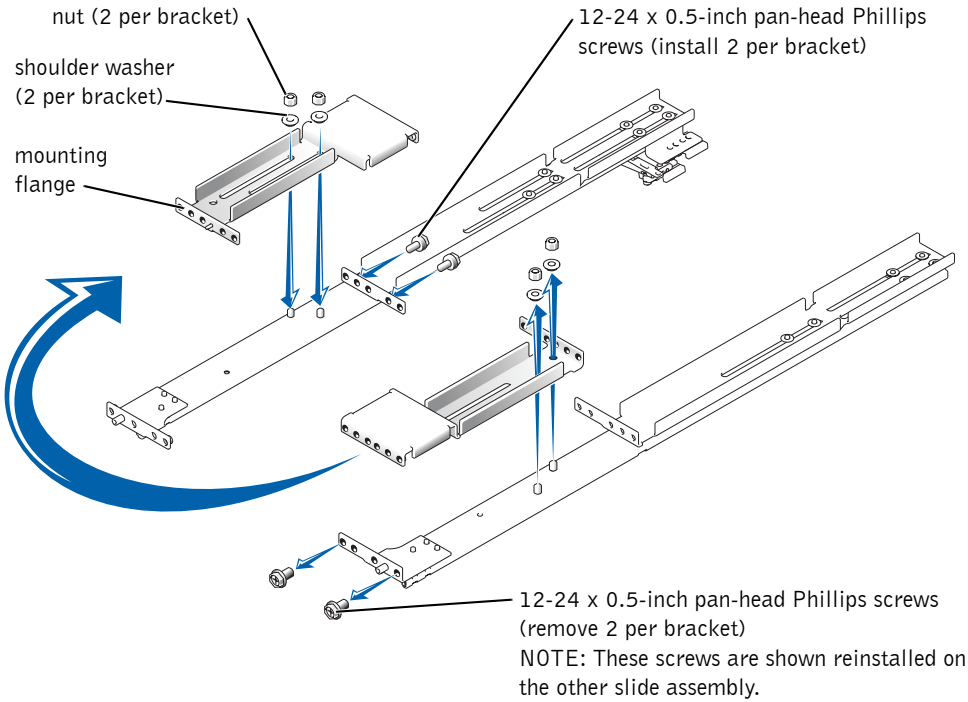
4. Place the bracket from one slide assembly onto the threaded studs on the opposite slide assembly, with the bracket turned 180 degrees so that the mounting flange faces forward (see Figure 1-5).

5. Secure each front center-mount bracket (by its nuts and shoulder washers) by finger-tightening them on their opposite slide assemblies using the two shoulder washers and two nuts you removed in step 2 (see Figure 1-5).

   The joined bracket becomes the new extended back bracket.

6. Repeat steps 4 and 5 to configure the other slide assembly.

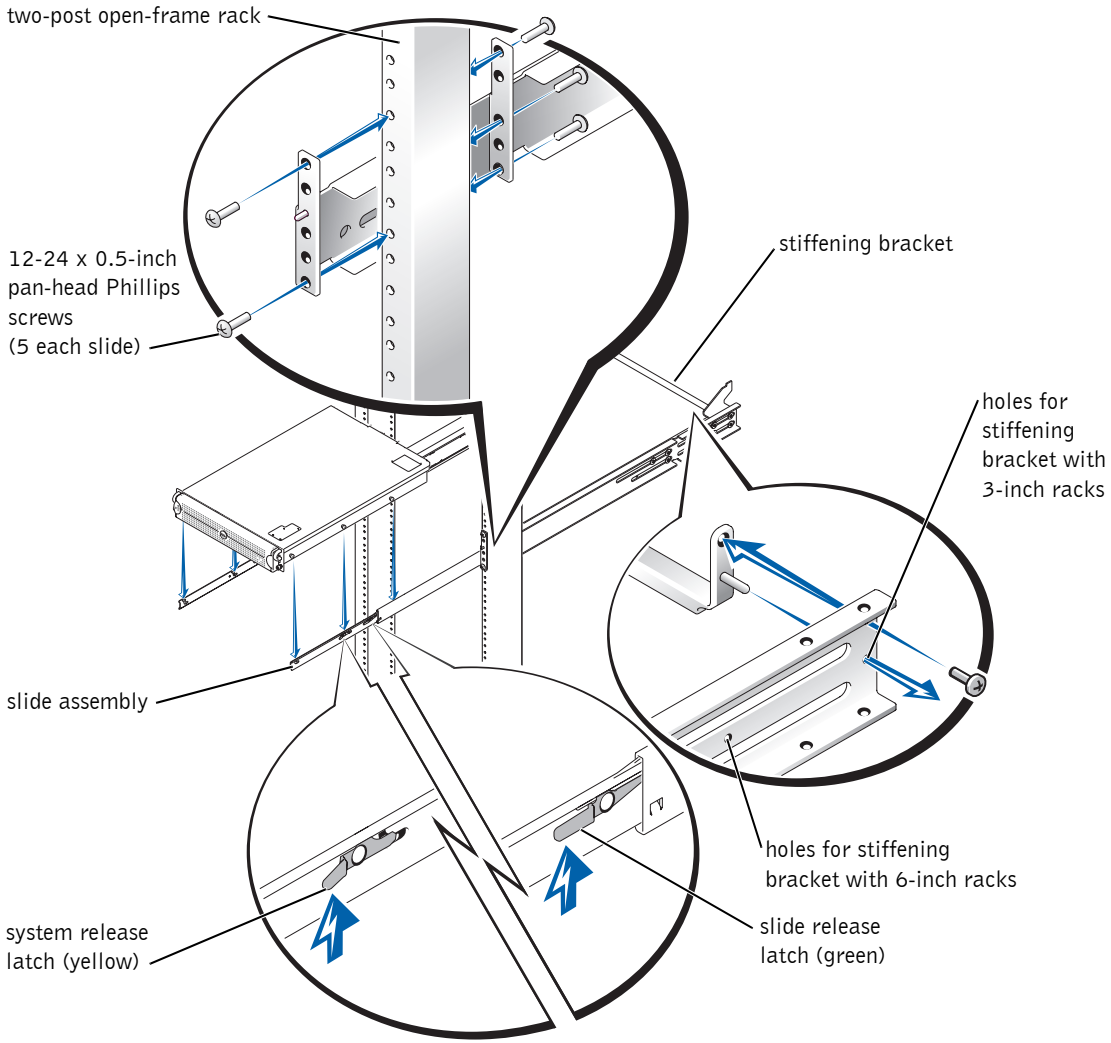
Figure 1-5. Rotating the Front Mounting Bracket for Flush-Mount Installation



7. Holding the left slide assembly into position in the two-post rack at the location you marked, adjust the extended back bracket tightly against the vertical two-post rack and secure it with three 12-24 x 0.5-inch pan-head Phillips screws (see Figure 1-6).
8. Secure the front bracket on the slide assembly to the two-post rail with two 12-24 x 0.5- inch pan-head Phillips screws (see Figure 1-6).
9. Perform steps 7 and 8 to install the right slide assembly in the rack.
10. Use an 11/32-inch wrench or nut driver to fully tighten the nuts on the mounting brackets on both slide assemblies that you tightened with your fingers.
11. Install the stiffening bracket between the slide assemblies and secure the bracket with a 12-24 0.5-inch pan-head Phillips screw on each slide assembly (see Figure 1-6).

    If the vertical rack is 3 inches wide, use the holes at the back end of the slide assemblies (shown in Figure 1-6). If the vertical rack is 6 inches wide, use the holes located 3 inches in front of the holes at the back end of the slide assemblies.

Figure 1-6. Installing the Slide Assemblies for Flush-Mount Configuration



Installing the System in the Rack

CAUTION: Due to the size and weight of the system, never attempt to install the system by yourself.

NOTE: The procedure for installing a system into a rack is identical for flush-mount and center-mount slide assemblies.

1. Pull the slides out to their 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 (see Figure 1-6).
3. Place one hand on the front-bottom of the system and the other hand on the back-bottom of the system.
4. Tilt the back of the system down while aligning the back shoulder screws on the sides of the system with the back slots on the slide assemblies.
5. Engage the back shoulder screws into their slots.
6. Lower the front of the system, and engage the front and middle shoulder screws in their slots (the middle slot is behind the yellow system release latch) (see Figure 1-6).

   When all shoulder screws are properly seated, the yellow latch on each slide assembly clicks and locks the system into the slide assembly.
7. Press up on the green slide release latch at the side of each slide to slide the system completely into the rack (see Figure 1-6).
8. Push in and turn the captive thumbscrews on each side of the front chassis panel to secure the system to the rack.

NOTE: Use the yellow system release latch whenever you wish to remove the system from the slide assemblies.

Installing the Cable-Management Arm

NOTICE: The cable-management arm can only be installed on the right side of the rack cabinet (as viewed from the back).

To install the cable-management arm on the system, perform the following steps:

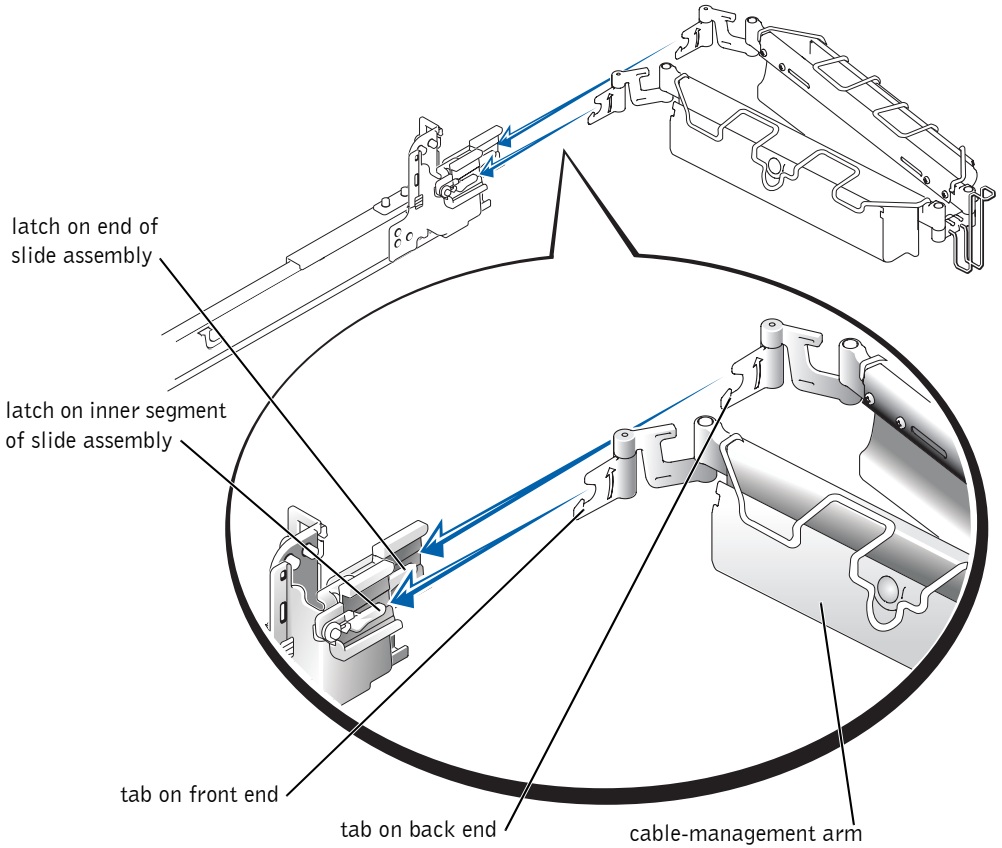
1. Facing the back of the rack cabinet, locate the latch on the end of the slide assembly.
2. Push the tab on the back end of the cable-management arm into the latch on the end of the slide assembly (see Figure 1-7).

   The latch clicks when locked.

3 Push the tab on the front end of the cable-management arm into a mating latch on the inner segment of the slide assembly (see Figure 1-7).

The latch clicks when locked.

Figure 1-7. Installing the Cable-Management Arm



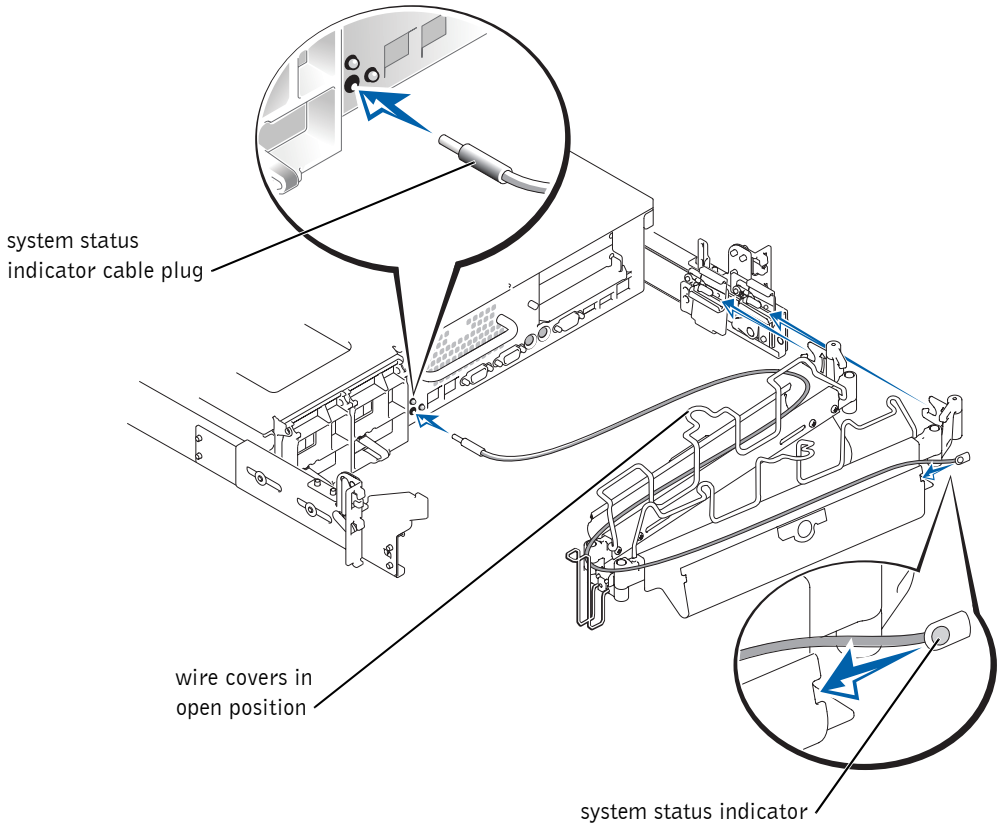
4 Install the system status indicator cable plug into its connector (see Figure 1-8).

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.

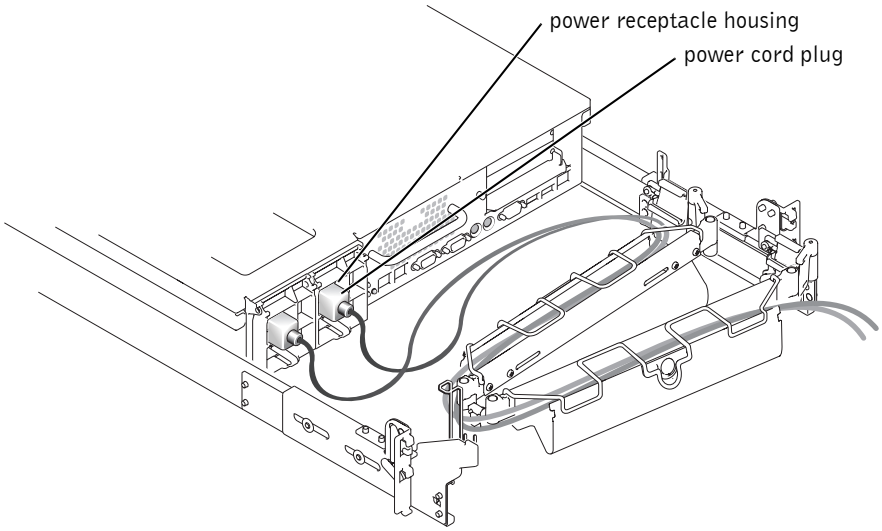
6 Route the system status indicator end of the cable through the cable-management arm, and install the indicator in its slot at the back end of the cable-management arm (see Figure 1-8).

Figure 1-8. Installing the System Status Indicator Cable



7 Connect the power cords to their receptacles on the back panel (see Figure 1-9).

Figure 1-9. Routing the Power Cords



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

Routing Cables

1. 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 the *User's Guide*.

2. 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.

3. 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.

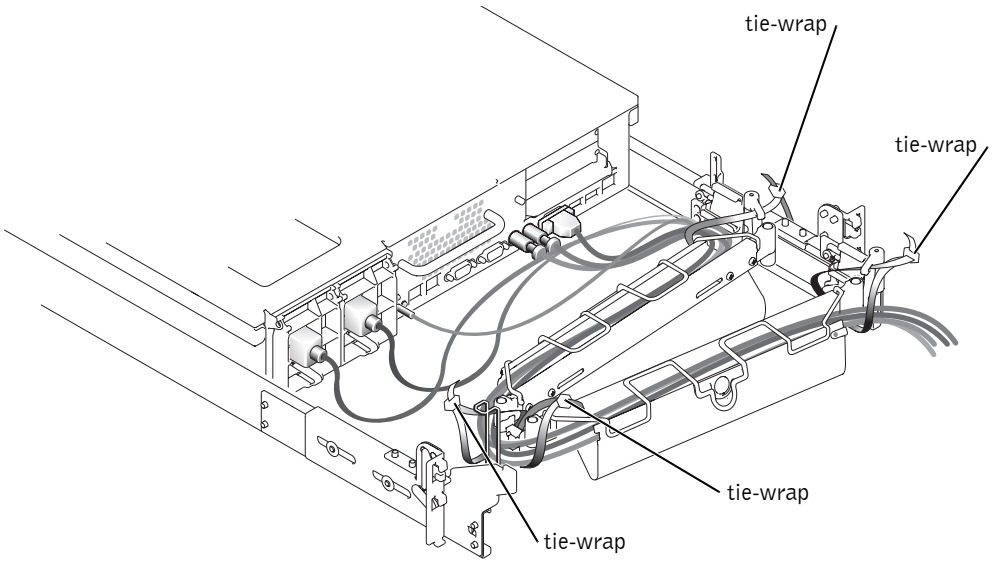
   c. Route the cables along the cable-management arm, make any adjustments needed to the cable slack at the hinge positions, secure the cables to the cable-management arm with the tie-wraps, and close the wire covers over the cable-management arm.

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.

4 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.

5 Tighten the tie-wraps 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.

Figure 1-10. Routing Cables



You have completed the installation of the rack kit in a two-post rack.