Dell™ Systems

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 server, storage system, or appliance from potential damage. For complete safety, regulatory, and warranty information, refer to your *System Information* document.

Precautions for Rack-Mountable Products

Observe the following precautions for rack stability and safety. Also refer to the rack installation documentation accompanying the system and the rack for specific warning and/or caution statements and procedures.

Servers, storage systems, and appliances are considered to be components in a rack. Thus, "component" refers to any server, storage system, or appliance, as well as to various peripherals or supporting hardware.

⚠ **CAUTION: Installing system components 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.**

⚠ **CAUTION: 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 rack 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 a rack by trained service technicians. If you install the kit in any other rack, be sure that the rack meets the specifications.

- Do not move large racks by yourself. Due to the height and weight of the rack, it is recommended that a minimum of two people perform this task.

- Before working on the rack, make sure that the stabilizers are secured to the rack, extend 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 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 systems/components in a rack.

Installation Instructions

This installation guide provides instructions for trained service technicians installing one or more systems in a rack cabinet. The RapidRails™ rack kit can be installed without tools in all of the manufacturer's rack cabinets and the VersaRails™ rack kit can be installed in most industry-standard rack cabinets. The procedures for installing both RapidRails and VersaRails rack kits are similar. One rack kit is required for each system to be installed in the rack cabinet.

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.**

Before You Begin

Before you begin installing your system in the rack, carefully read "Safety Instructions," found earlier in this guide, as well as the safety instructions found in your system's *System Information* document 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.**

✍ **NOTE:** For instructions on installing the system itself, see "Installing a System in the Rack."

Important Safety Information

Observe these safety precautions 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 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 and anchored to the floor could cause the rack to tip over, potentially resulting in bodily injury under certain circumstances. Therefore, always install and anchor 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. Refer to the documentation provided with the rack cabinet for instructions on installing and anchoring the stabilizer feet.

Installation Tasks

Installing a rack kit involves the following tasks, which are described in detail in the following subsections:

1 Removing the rack doors

2 Marking the rack

3 Installing the slide assemblies in the rack

4 Installing the system in the rack

5 Installing the cable-management arm

6 Routing cables

7 Replacing the rack doors

✎ **NOTE:** There are two procedures for task 3, installing the slide assemblies in the rack. One procedure is for the RapidRails kit, and one is for the VersaRails kit.

Recommended Tools and Supplies

You need the following tools and supplies to install the system in a four-post rack cabinet:

• A #2 Phillips screwdriver

• Masking tape or a felt-tip pen, for use in marking the mounting holes to be used

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

• Two cable-management arm mounting brackets

Figure 1-1. RapidRails Rack Kit Contents
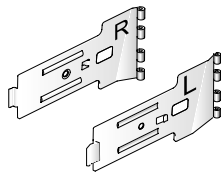
cable-management arm brackets (2)
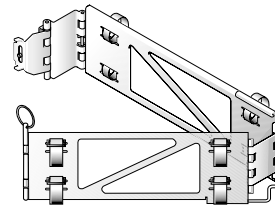
cable-management arm
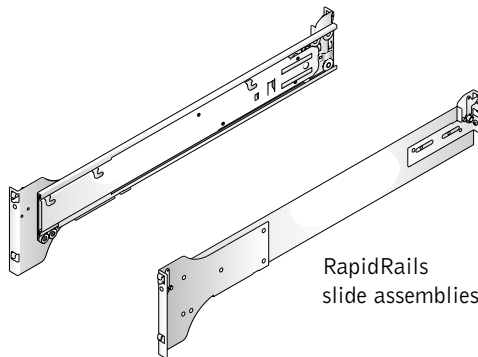
RapidRails
slide assemblies (2)

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 with brackets for round- and square-hole racks
- Two cable-management arm mounting brackets
- 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

bracket for vertical
rail with round holes

cable-management arm brackets

cable-management arm assembly
with vertical rail bracket for
square holes

VersaRails slide assemblies (2)

10-32 x 0.5-inch flange-head Phillips screws (8)
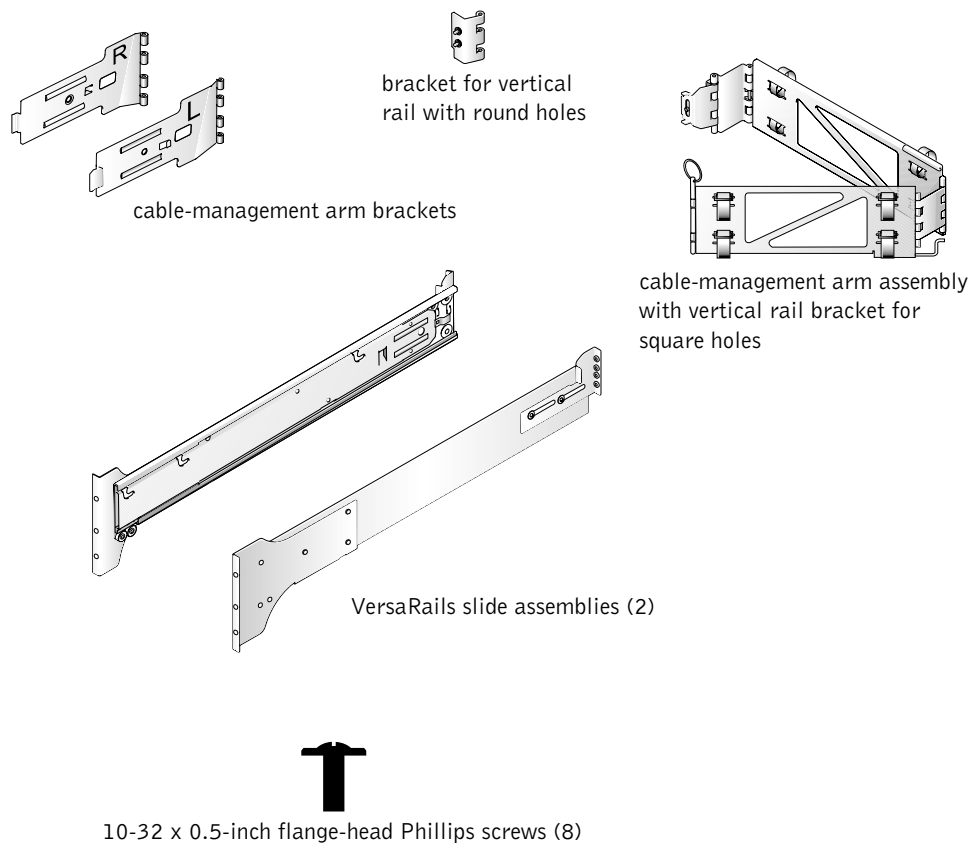
Rack Requirements for VersaRails

⊙ **NOTICE:** This 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.

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 accidently fall over.**

Marking the Rack

You must allow 4 U (17.7 cm, or 7 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 rear vertical rails (see Figure 1-3). 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 wish, 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. If you choose this method, skip ahead to "Installing the RapidRails Slide Assemblies."

Figure 1-3.   One Rack Unit

1 U (44 mm or 1.75 inches)

12.7 mm (0.5 inch)

15.9 mm (0.625 inch)

15.9 mm (0.625 inch)

12.7 mm (0.5 inch)
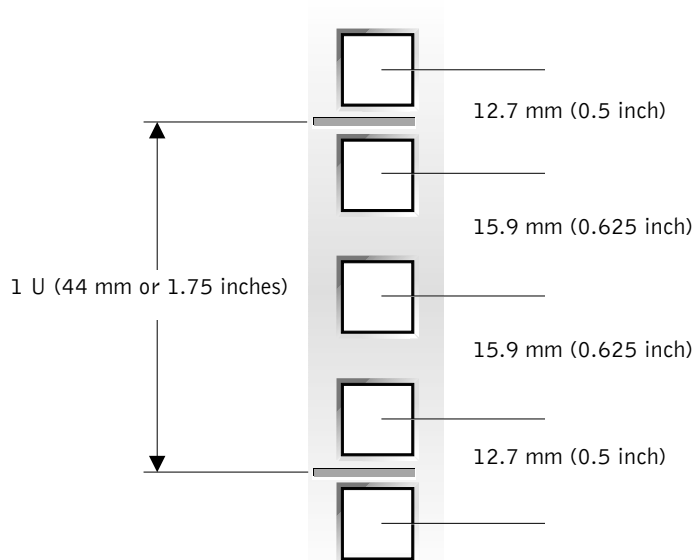
⚠ **CAUTION: If you are installing more than one system, install the slide assemblies so that the first system is installed in the lowest available position in the rack.**

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 1-3).

2 Place a mark 17.7 cm (7 inches) above the original mark you made (or count up 12 holes in a rack that meets EIA-310 standards) and mark the rack's front vertical rails with a felt-tipped marker 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
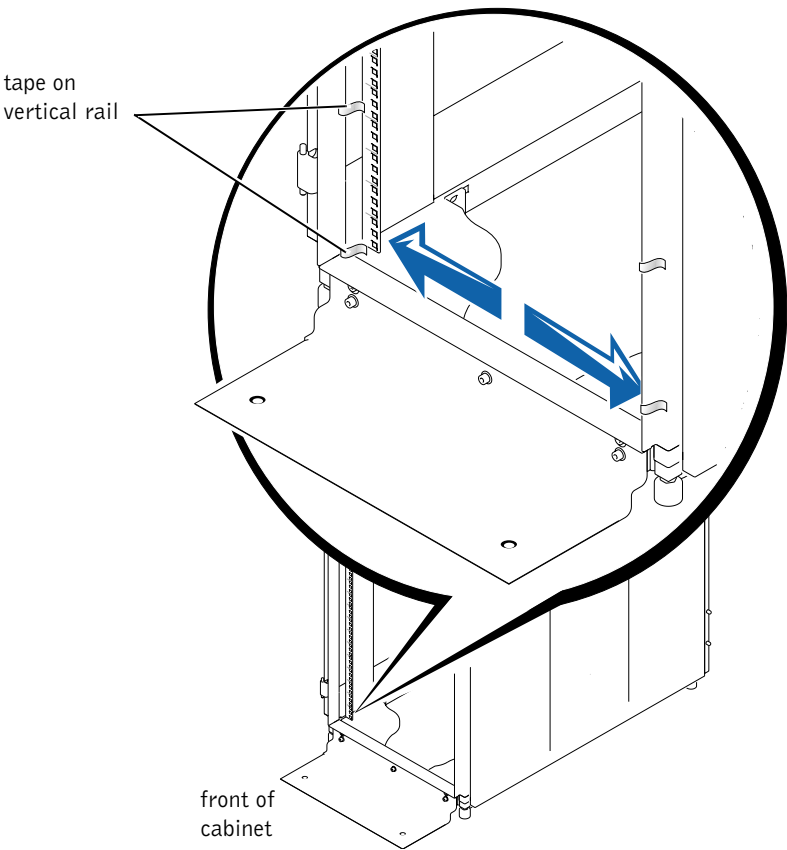
tape on
vertical rail

front of
cabinet

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 between the marks or tape you placed on the rack (see Figure 1-4).

   The mounting hook at the top of the slide assembly's mounting-bracket flange should enter the top hole between the marks you made on the vertical rails.

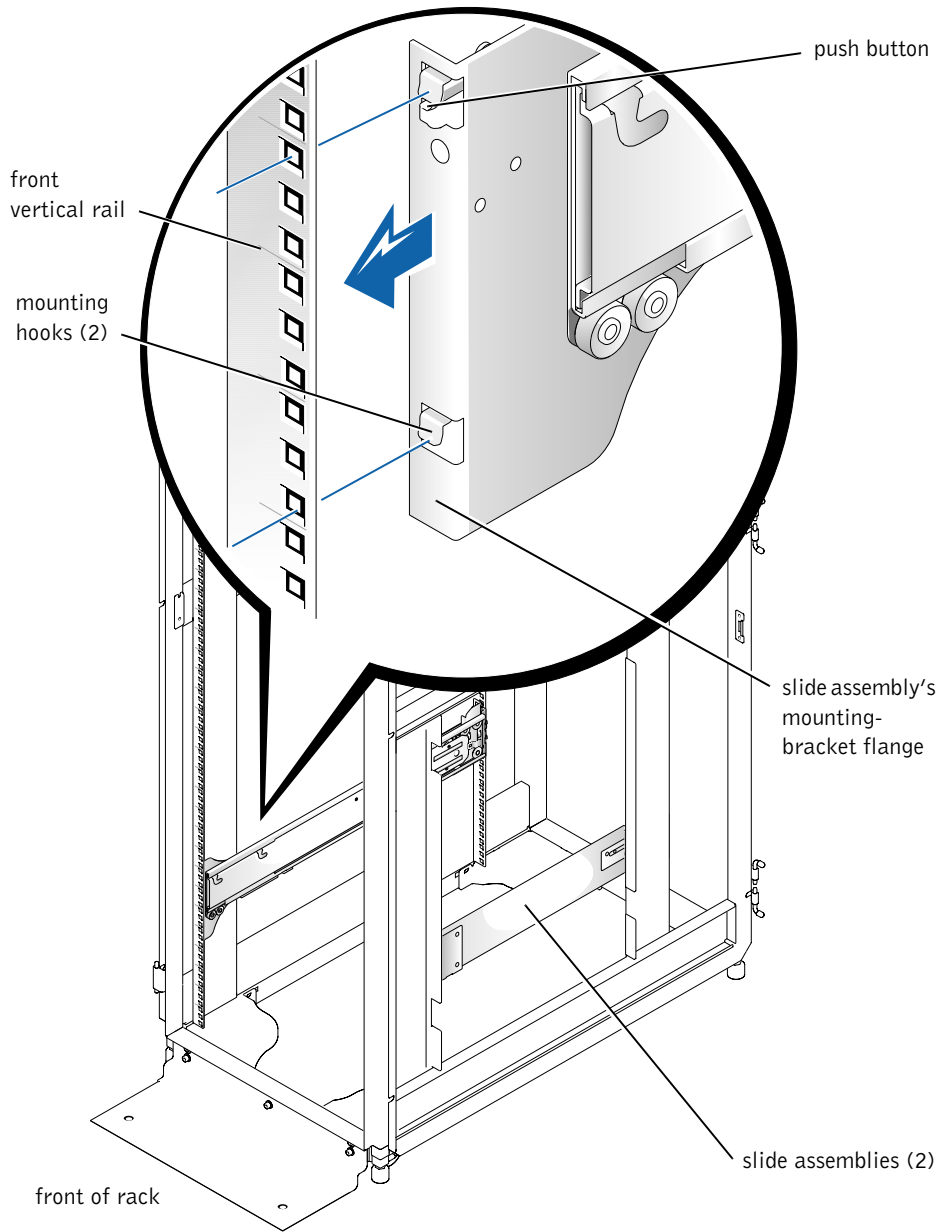2. Push the slide assembly forward until both mounting hooks enter their respective square holes on the vertical rail, and then push down on the mounting-bracket flange until the mounting hooks are seated in the square holes and the blue push button pops out and clicks (see Figure 1-5).

3. At the back of the cabinet, pull back on the mounting-bracket flange until the mounting hooks are located in their respective square holes, and then push down on the mounting-bracket flange until the mounting hooks are seated in their square holes and the push button pops out and clicks.

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

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

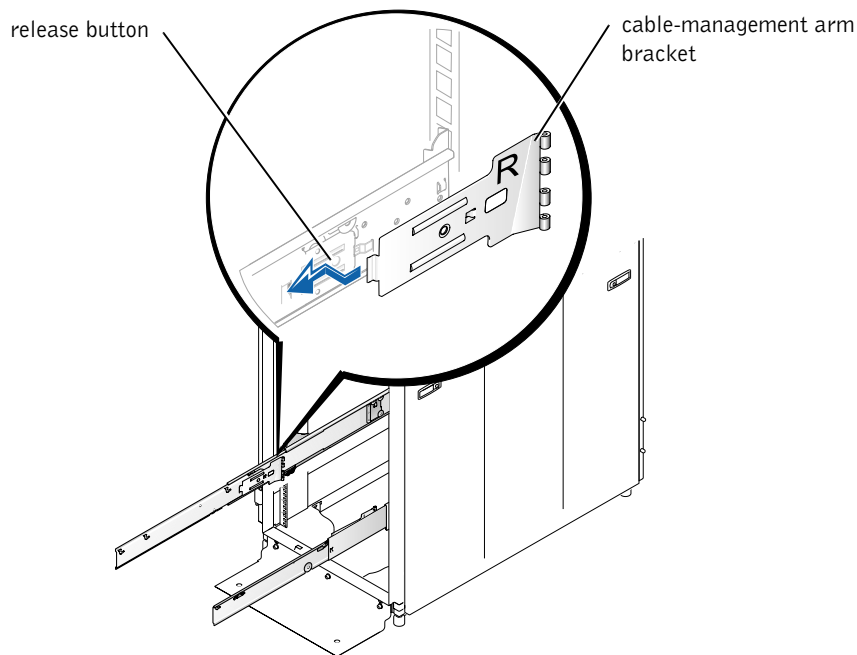**Figure 1-5. Installing the RapidRails Slide Assemblies**

push button

front
vertical rail

mounting
hooks (2)

slide assembly's
mounting-
bracket flange

slide assemblies (2)

front of rack

6 If you intend to install the cable-management arm on the left side of the rack cabinet (as viewed from the front), pull the left slide assembly out to its fully extended position (see Figure 1-6).

7 Align the cable-management arm bracket (stamped with **R**) so that the two angular tabs are aligned with slots on the inside of the left slide assembly.

8 Press the cable-management arm bracket (stamped with **R**) into its slot on the inside of the left slide assembly, and slide the bracket toward the front of the slide assembly about 12.7 mm (0.5 inch) (see Figure 1-6).

   A release button on the slide assembly enters the round opening on the cable-management arm bracket. This button clicks into place, locking the cable-management arm bracket to the slide assembly. Use this release button if you ever need to remove the cable-management arm bracket.

Figure 1-6.   Installing the Cable-Management Arm Bracket

release button

cable-management arm bracket

Installing the VersaRails Slide Assemblies

1 At the front of the rack cabinet, position one of the VersaRails slide assemblies so that its mounting-bracket flange fits between the marks or tape (or numbered location) on the rack (see Figure 1-4).

   The three holes on the front of the mounting bracket should align with three holes on the vertical rail (your rack may have round or square holes on its vertical rail).

2 Install two 10-32 x 0.5-inch flange-head Phillips screws in the mounting bracket's top and bottom holes to secure the slide assembly to the front vertical rail (see Figure 1-7).

   Ensure that the threaded holes on the mounting-bracket flange are centered over the corresponding holes in the vertical rails.

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 If the rack has square holes, install two 10-32 x 0.5-inch flange-head Phillips screws in the mounting bracket's top and bottom holes to secure the slide assembly to the back vertical rail.

   If the rack has round holes, install one 10-32 x 0.5-inch flange-head Phillips screw in the mounting bracket's bottom hole to secure the slide assembly to the back vertical rail.

5 Repeat steps 1 through 4 for the remaining slide assembly on the other side of the rack.

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

Figure 1-7. Installing the VersaRails Slide Assemblies

front
vertical rail

mounting
hole

10-32 x 0.5
inch flange-
head Phillips
screws (8)

slide assembly's
mounting-
bracket flange

front of rack
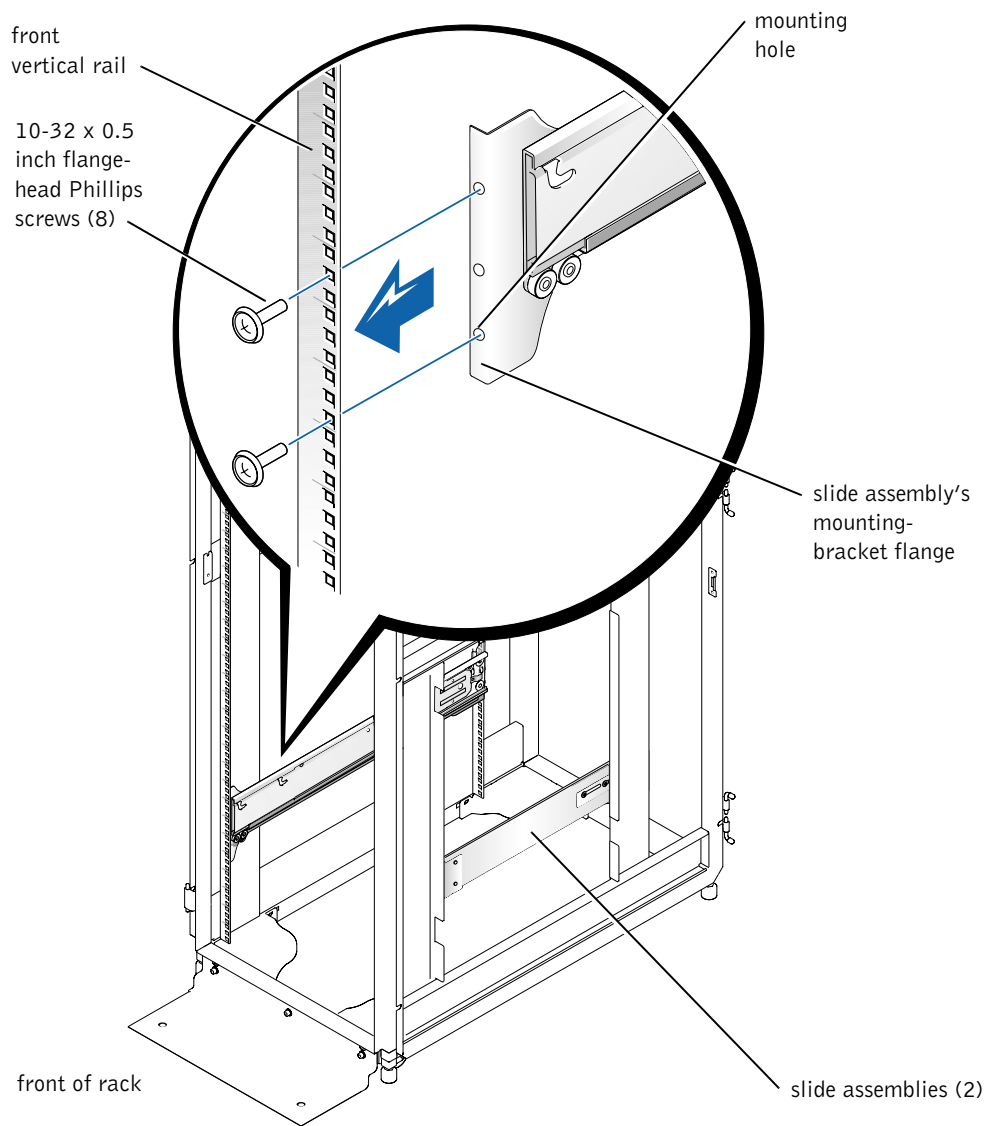
slide assemblies (2)

NOTE: If you intend to install the cable-management arm on the right side of the rack cabinet (as viewed from the front), perform steps 7 through 9 using the right slide assembly (as viewed from the front) instead of the left slide assembly.

7   If you intend to install the cable-management arm on the left side of the rack cabinet (as viewed from the front), pull the left slide assembly out to its fully extended position (see Figure 1-6).

8   Align the cable-management arm bracket (stamped with **R**) so that the two angular tabs are aligned with slots on the inside of the left slide assembly.

9   Press the cable-management arm bracket (stamped with **R**) into its slot on the inside of the left slide assembly, and slide the bracket toward the front of the slide assembly about 12.7 mm (0.5 inch) (see Figure 1-6).

A release button on the slide assembly enters the round opening on the cable-management arm bracket. This button clicks into place, locking the cable-management arm bracket to the slide assembly. Use this release button if you ever need to remove the cable-management arm bracket.

Installing the System in the Rack

This procedure applies to racks with installed RapidRails or VersaRails slide assemblies.

⚠ **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.**

⚠ **CAUTION: Reduce the weight of the system chassis by labeling and removing hard drives and power supplies.**

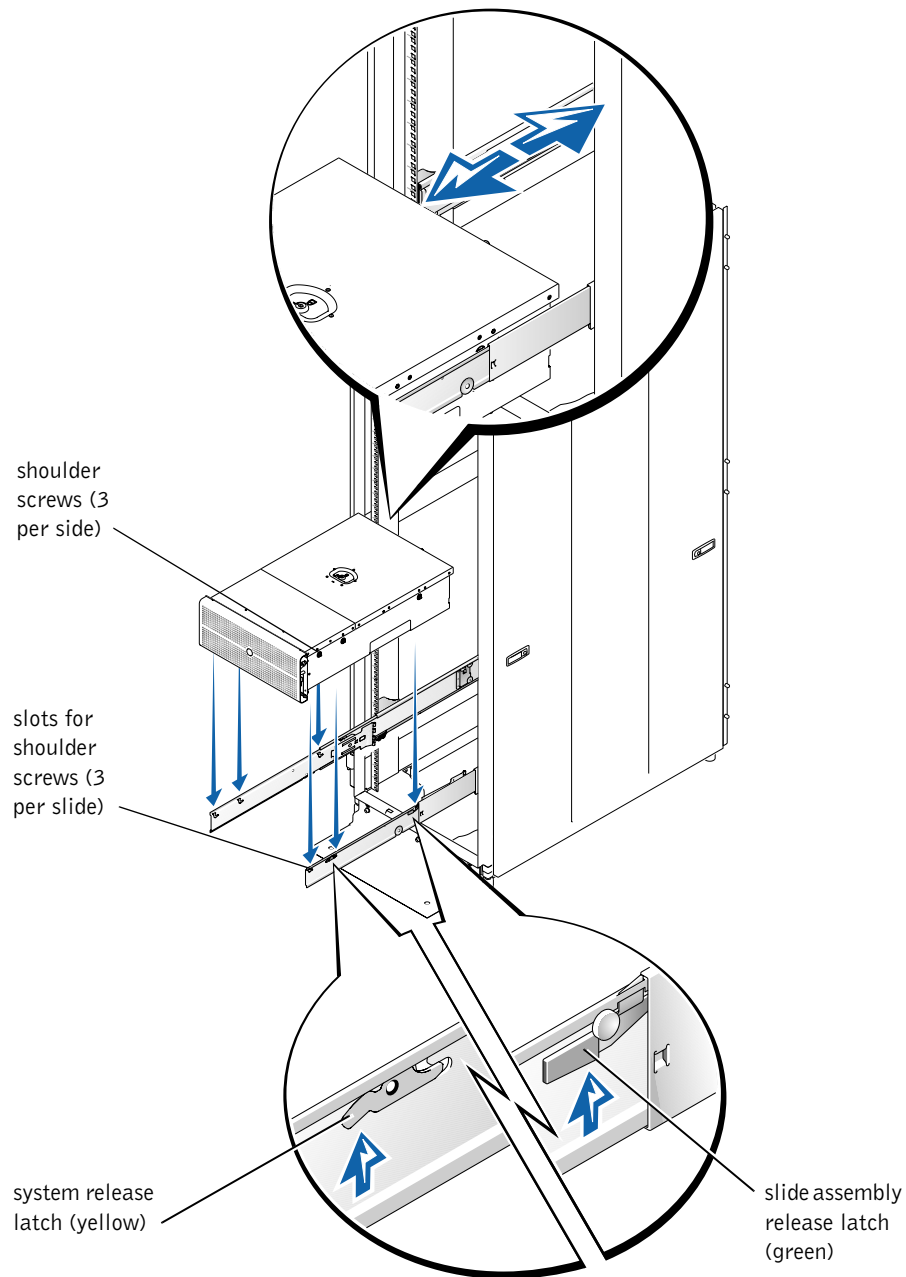1   Pull the two slide assemblies out of the rack until they lock in the fully extended position.

⚠ **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 above the extended slides.

Using a minimum of two persons, each person should lift the chassis from the side of the chassis. If you are installing the system high up in the rack, consider using four persons and platforms or mechanical hoisting equipment.

3   Align the three shoulder screws on the sides of the system with the slots on the inner side of the slide assemblies (see Figure 1-8).

Figure 1-8. Installing the System in the Rack

shoulder screws (3 per side)

slots for shoulder screws (3 per slide)

system release latch (yellow)

slide assembly release latch (green)

4 Lower the system into the slide assemblies (see Figure 1-8).

When all shoulder screws are properly seated, the yellow latch on each slide assembly clicks and locks the system into the slide assembly.

5 Press in on each slide assembly's green release latch and push the chassis into the rack (see Figure 1-8).

6 Push in and turn the captive thumbscrews on each side of the front panel to secure the system to the rack.

NOTE: As you pull the system out to its farthest extension, the slide assemblies will lock in the extended position. To push the system back into the rack, press the green release latches on the sides of the slide assemblies (see Figure 1-8) to release the locks, and then slide the system completely into the rack.

NOTE: A yellow system release latch is located on each slide. Use this latch when you wish to lift the system out of the slide assemblies (see Figure 1-8).

Installing the Cable-Management Arm

You can install the cable-management arm on either side of the rack cabinet. This procedure describes the steps to install the cable-management arm on the right side (as viewed from the back of the cabinet).

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

1 Facing the back of the rack cabinet, locate the vacant threaded hole(s) on the right-side vertical rail where you installed the slide assembly.

2 If you are installing the RapidRails kit or a VersaRails kit on a rack cabinet with square holes, the vertical rail mounting bracket with the single thumbscrew is already installed on the cable-management arm (see Figure 1-9).
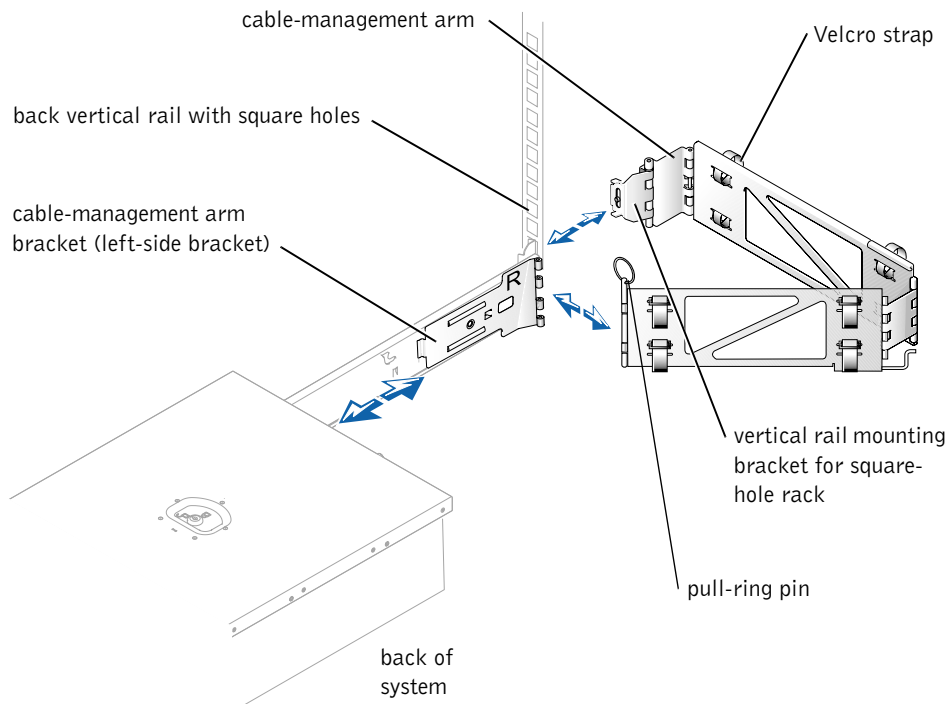
If you are installing the VersaRails kit in a rack with round holes, remove the vertical rail mounting bracket with a single thumbscrew and install the vertical rail mounting bracket with two thumbscrews on the cable-management arm (see Figure 1-10).

3 Using the thumbscrew(s) on the vertical rail mounting bracket, secure the bracket to the back of the right vertical rail, immediately behind the right slide assembly.
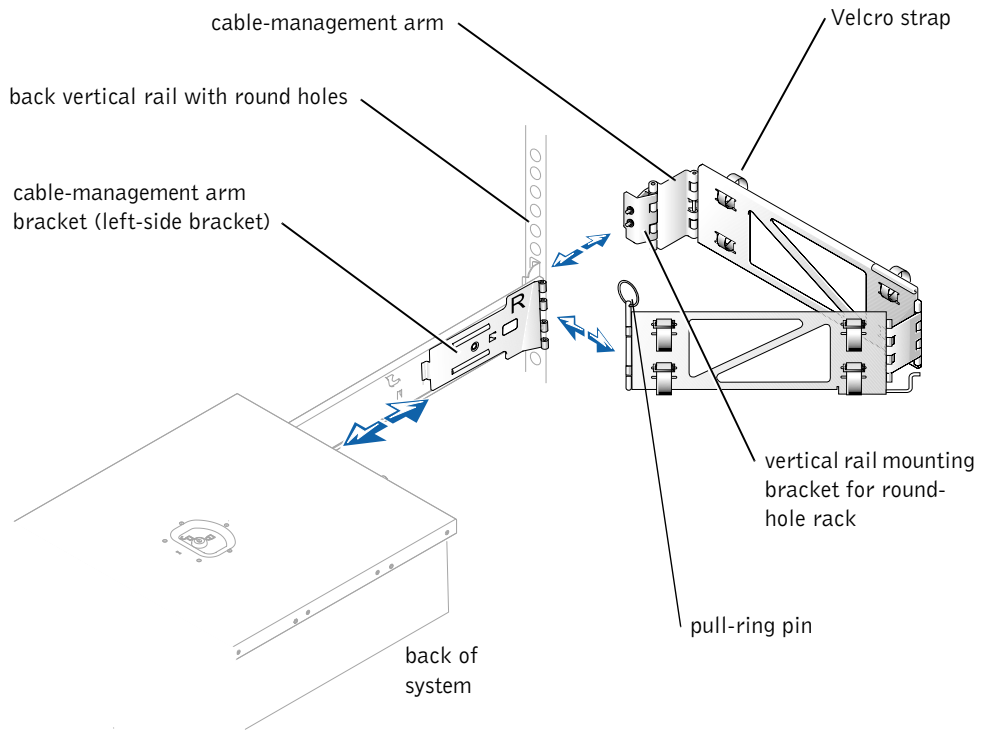
The thumbscrew(s) install in holes not used by the slide assemblies.

4 Align the hinge halves (one on the back end of the previously installed cable-management arm bracket, and the other on the free end of the cable-management arm) and join them with the pull-ring pin (see Figure 1-9 and Figure 1-10).

Figure 1-9.   Installing the Cable-Management Arm (RapidRails and VersaRails With Square-Hole Rack)

cable-management arm

Velcro strap

back vertical rail with square holes

cable-management arm
bracket (left-side bracket)

vertical rail mounting
bracket for square-
hole rack

pull-ring pin

back of
system

Figure 1-10. Installing the Cable-Management Arm (VersaRails With Round-Hole Rack)

cable-management arm

Velcro strap

back vertical rail with round holes

cable-management arm bracket (left-side bracket)

vertical rail mounting bracket for round-hole rack

pull-ring pin

back of system

Routing Cables

1. Attach the input/output (I/O) cables to their respective connectors on the system's back panel.

2. Connect the remaining cables to the system.

    For details, see your system's *Installation and Troubleshooting Guide* and *User's Guide*.

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 out to the fully extended position.

c Route the power cables through the lower set of Velcro straps (see Figure 1-11).

d Route the remaining I/O cables along the cable-management arm, allowing some additional slack in the cables at the hinge positions, and secure the cables to the cable-management arm with the upper set of Velcro straps on the cable-management arm.

Figure 1-11. Routing Cables (Top View)

power cables

cable-management arm
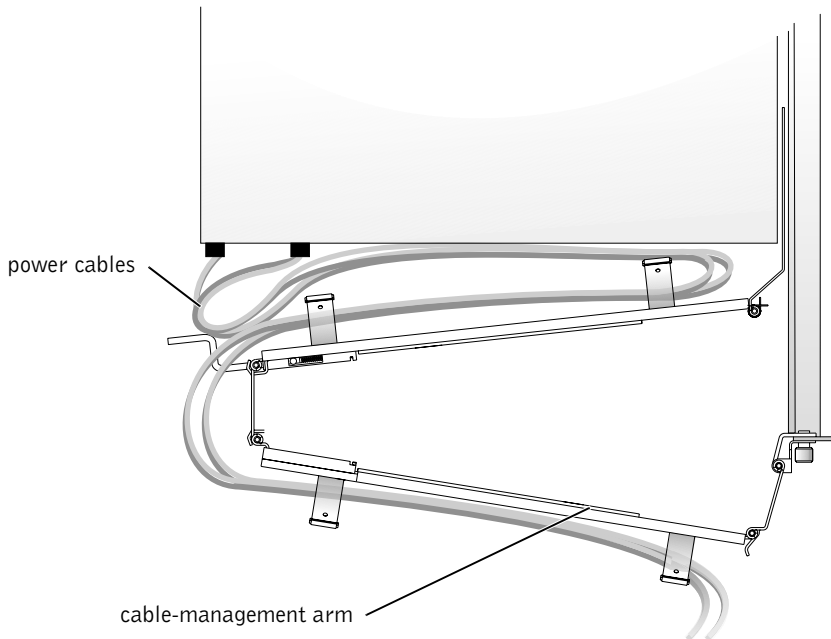
4 Slide the system in and out of the rack to verify that the cables are routed correctly and do not bind, stretch, or pinch with the movement of the cable-management arm.

5 Push in and tighten the captive thumbscrews that you loosened in step 3a.

Replacing the Rack Doors

Refer to the procedures for replacing 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.**

This completes the rack installation of your system.

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