

Dell® PowerEdge® 2100 and 2200 Systems

RACK KIT INSTALLATION GUIDE



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Read This First

A prerequisite for using this manual to service Dell computer systems is a basic knowledge of IBM®-compatible PCs and prior training in IBM-compatible PC troubleshooting techniques. In addition to information provided in this manual and the *User's Guide* that came with the system, Dell provides the *Diagnostics and Troubleshooting Guide* for troubleshooting procedures and instructions on using the Dell diagnostics to test the computer system.

Warnings, Cautions, and Notes

Throughout this manual, there may be blocks of text printed in bold type or in italic type. These blocks are warnings, cautions, and notes, and they are used as follows:

WARNING: A WARNING indicates the potential for bodily harm and provides instructions for how to avoid the problem.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and provides instructions for how to avoid the problem.

NOTE: A NOTE provides helpful information about using the computer system.

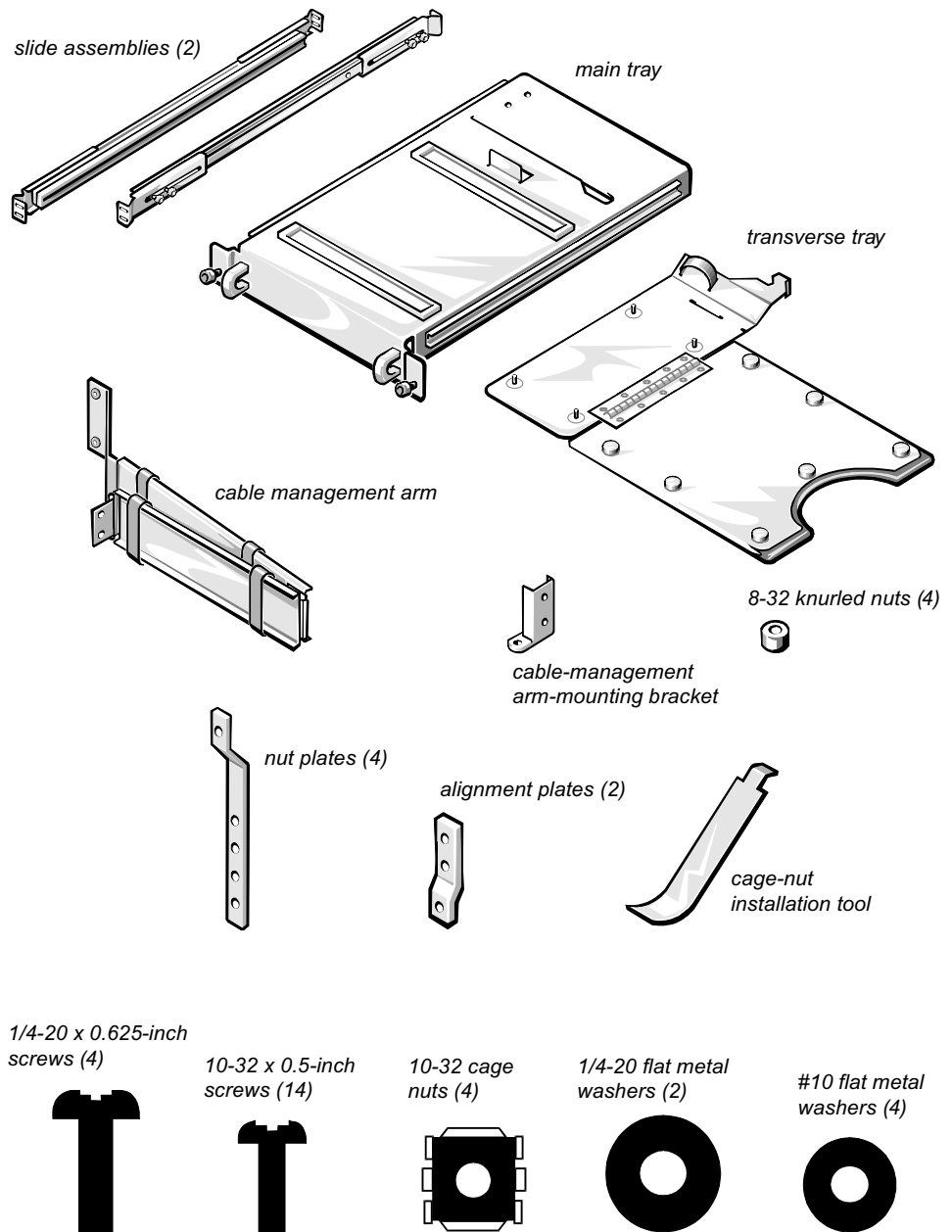
Dell® PowerEdge® 2100 and 2200 Systems Rack Kit Installation Guide

This installation guide provides instructions for trained service technicians to install one or more Dell PowerEdge 2100 or 2200 systems in a Dell rack. One rack kit is required for each PowerEdge system to be installed in the rack. The rack kit includes the following items (see Figure 1):

- One pair of slide assemblies with mounting brackets
- One main tray with built-in rails
- One transverse tray with built-in slides
- One cable-management arm-mounting bracket
- One cable management arm
- Four curved nut plates
- Two alignment plates
- One cage-nut installation tool
- Fourteen 10-32 pan-head Phillips screws
- Four #10 flat metal washers
- Four 1/4-20 pan-head Phillips screws
- Two 1/4-20 flat metal washers
- Four 10-32 cage nuts
- Four 8-32 knurled nuts

NOTES: If you have purchased a Dell rack system along with your PowerEdge 2100 or 2200 system, the rack kit is pre-installed in the rack.

The nonmetric screws called out in illustrations and procedural steps are identified first by size and then by the number of threads per inch. For example, a #10 Phillips screw with 32 threads per inch is identified as a 10-32 screw.



NOTE: The screws, nuts, and washers shown in black are actual-size templates.

Figure 1. Rack Kit Contents

Before You Begin

Before you begin installing your PowerEdge 2100 or 2200 system, carefully read the safety precautions and installation restrictions in the following subsections.

Kit Installation Restrictions

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

WARNING: Dell's server systems are certified as components for use in Dell's Rack Cabinet using the Dell Customer Rack Kit. The final installation of Dell servers and Rack Kits in any other brand of rack cabinet has not been approved by any safety agencies. It is the customer's responsibility to have the final combination of Dell servers and Rack Kits for use in other brands of rack cabinets evaluated for suitability by a certified safety agency.

Rack Stabilizer Feet

WARNING: Installing PowerEdge 2100 or 2200 systems in a Dell rack without the front and side stabilizer feet installed could cause the rack to tip over, resulting in bodily injury under certain circumstances. Therefore, always install the stabilizer feet before installing components in the rack.

The stabilizer feet help prevent the possibility of the rack tipping over when a PowerEdge 2100 or 2200 system is installed and then pulled out of the rack to the fully extended position of the slide assemblies. Refer to the *Dell PowerEdge Rack-Mountable Solutions Installation Guide* provided with the rack for instructions on installing the stabilizer feet.

WARNING: After installing computers in a rack, never pull more than one computer out of the rack on its slides at one time. The weight of more than one computer extended on slides could cause the rack to tip over and injure someone.

Recommended Tools

To install the rack kit, you should have the following tools:

- A #2 Phillips screwdriver
- A 3/8-inch nut driver
- The cage-nut installation tool included in the rack kit
- A steel measuring tape

Installing the Rack Kit in the Rack

NOTES: If you purchased a Dell rack system along with your PowerEdge 2100 or 2200 system, the rack kit is pre-installed in the rack.

For instructions on installing the PowerEdge system itself, see “Installing the PowerEdge 2100 or 2200 System in the Rack” found later in this guide.

Use the following procedure to install the rack kit in the rack:

- 1. Remove the rack’s front and back doors.**
- 2. Install the slide assemblies in the rack.**
- 3. Install the mounting bracket for the cable management arm.**
- 4. Install the main tray in the slide assemblies.**
- 5. Install the cable management arm on the bracket.**
- 6. Install the transverse tray onto the main tray.**

The subsections that follow include instructions for performing these tasks.

Removing the Doors From the Rack

You must remove the doors from the rack to provide access to the interior of the rack and to prevent damage to the doors while installing the kit. Use the following procedure to remove the doors.

WARNING: Use two people to remove the doors to prevent personal injury.

1. Open the latch on the front door.

Slide the latch's push button cover up as far as it will go, press the push button, rotate the handle clockwise until the latch releases, and then pull the door open (see Figure 2).

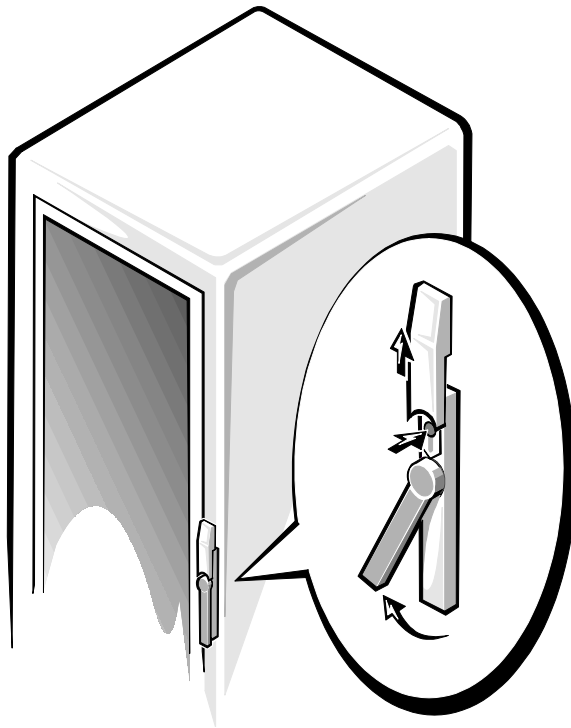


Figure 2. Opening the Latch on the Door

2. Remove the front door as shown in Figure 3.

- a. One person should grasp the top of the door to stabilize it. The other person should grasp the bottom of the door.
- b. The person holding the bottom of the door should press the release lever on the bottom hinge and then pull the bottom of the door away from the rack a few inches.
- c. The person holding the top of the door should press the release lever on the top hinge and then pull the door away from the rack.

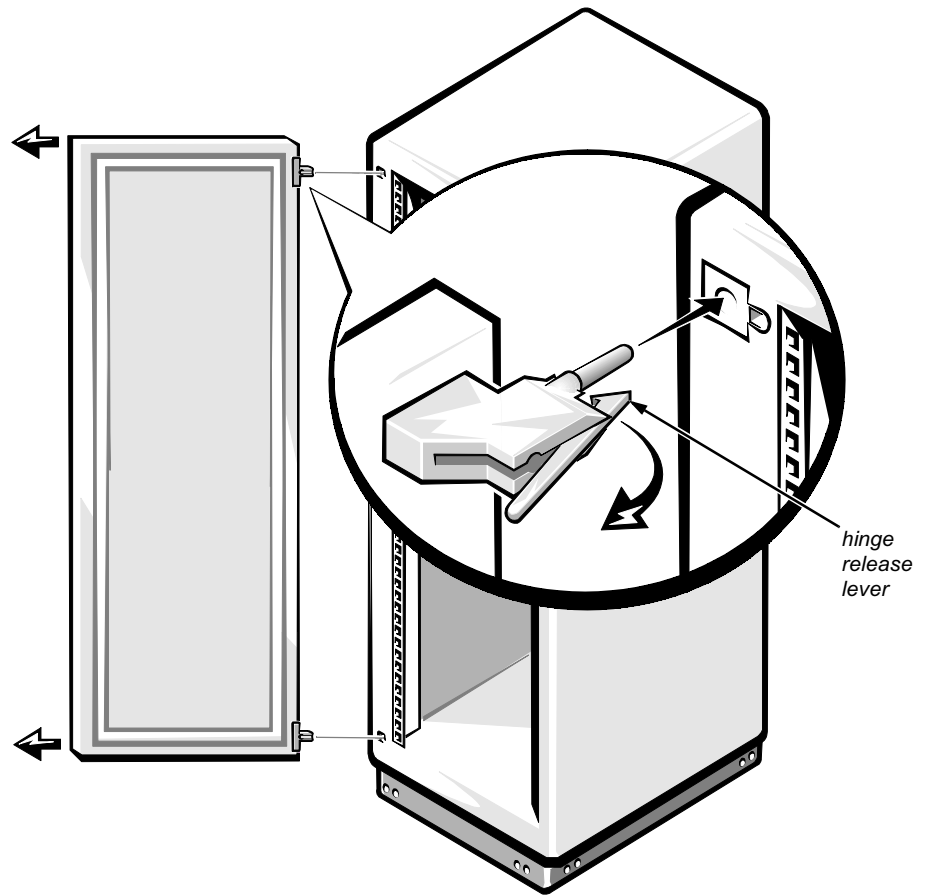


Figure 3. Removing the Doors

3. Repeat steps 1 and 2 to remove the back door from the rack.

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

Installing the Slide Assemblies in the Rack

Use the following procedure to install the slide assemblies in the rack.

1. Determine where you want to install the slide assemblies.

WARNING: If you are installing more than one computer, install the slide assemblies so that the first computer is installed in the lowest position in the rack.

If you intend to install more than one PowerEdge 2100 or 2200 system in the rack, you must install the slide assemblies so that there is at least 12.25 inches of vertical space between the bottom of one slide assembly and the bottom of the next (see Figure 4). In the Dell rack, this distance is equal to 21 holes in the vertical rails between slide assemblies. To install the computer in the rack's lowest position, select the ninth hole from the bottom of each vertical rail in which to install the cage nuts, as described in step 2.

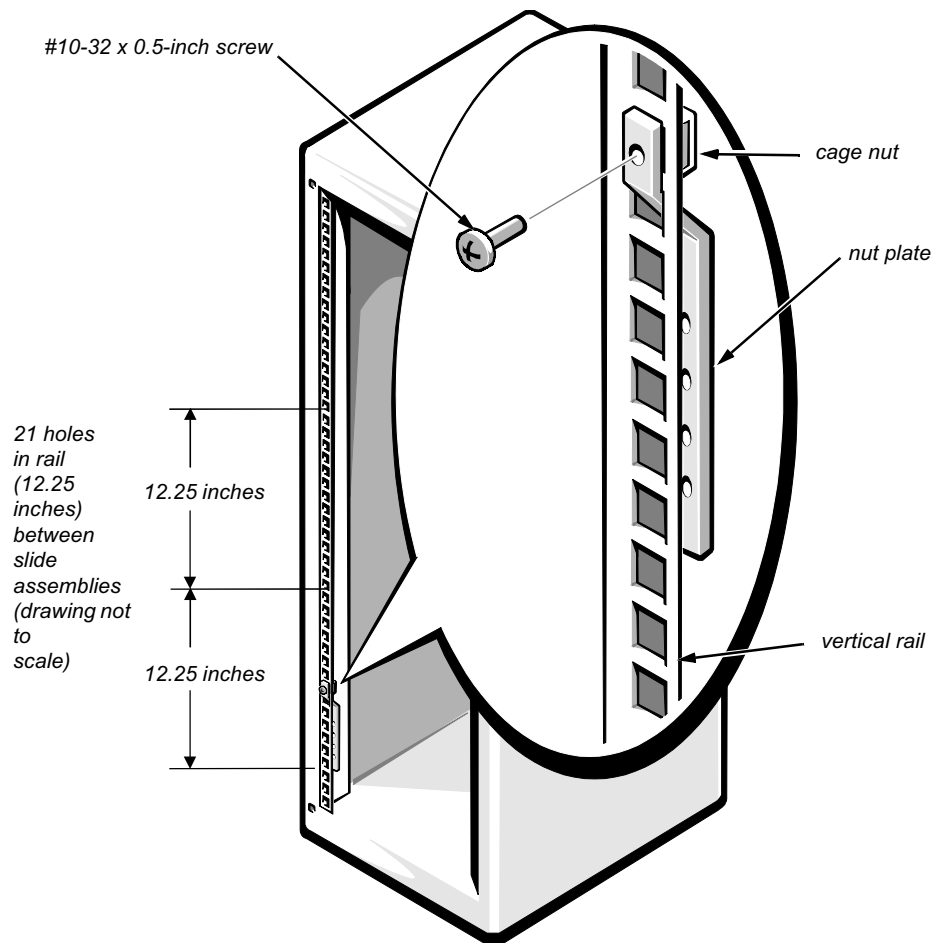


Figure 4. Determining Where to Install the Slide Assemblies

After determining where to install the slide assemblies, mark the locations of the cage nuts on the rack's vertical rails with a felt-tipped marker or masking tape.

2. Install the cage nuts and nut plates.

Install the curved nut plates on the vertical rails where you want the ends of the slide assemblies to be located (see Figure 5). Each curved nut plate is held in place by one Phillips screw and one cage nut.

The following substeps explain how to install the cage nuts and the nut plates:

- Insert the lower lip of the 10-32 cage nut over the bottom of the opening in the back of a rail as shown in the cage-nut installation graphic in Figure 5. Then insert the small end of the cage-nut installation tool through the opening in the rail (from the front), and hook the tool over the top lip of the cage nut.
- Push in on the cage nut while rotating the tool up and pulling the tool back toward you until the top lip of the cage nut snaps into position.
- Repeat this process to install the remaining cage nuts.
- To install one of the curved nut plates, insert it through the hole below the cage nut (from the back of the rail) as shown in the nut-plate installation graphic in Figure 5, and then secure the nut plate in place with a 10-32 x 0.5-inch Phillips screw (see Figure 5).
- Repeat substeps a through d to install the remaining nut plates.

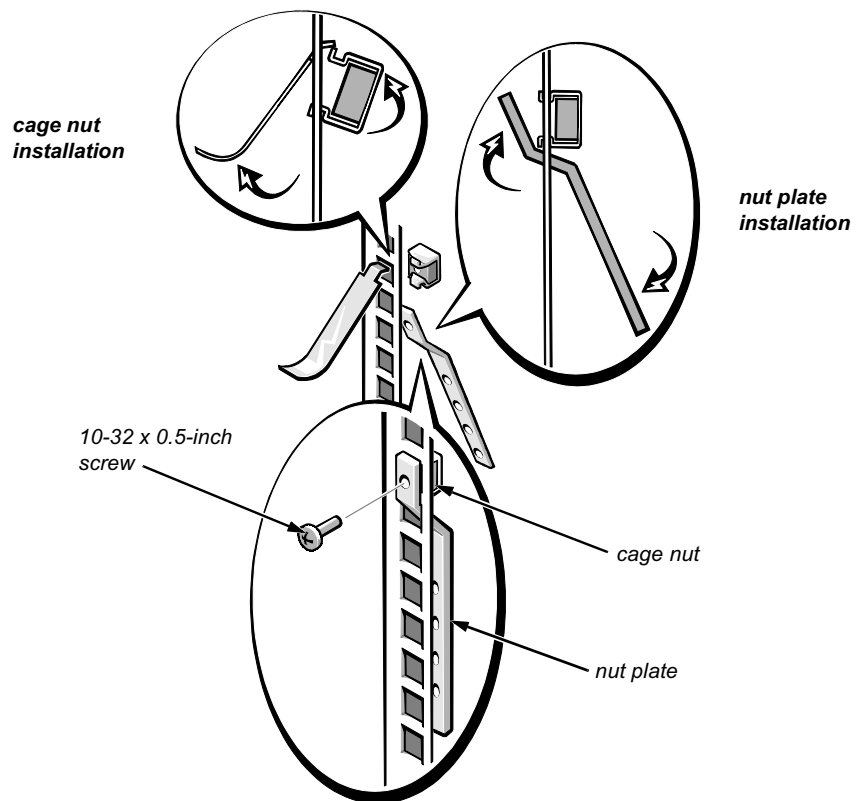


Figure 5. Installing the Cage Nuts and Nut Plates

3. Remove any obstructions before installing the slides.

NOTE: Do not adjust the location (front-to-back position) of the rail if the T-shaped brackets are moved.

The vertical rails are held in position with adjustable T-shaped brackets. If any of these brackets are positioned so that they will interfere with the proper fit of a slide, remove the two Phillips screws securing the bracket to the vertical rail and move the bracket to the next adjacent three-hole grouping in the rail (see Figure 6).

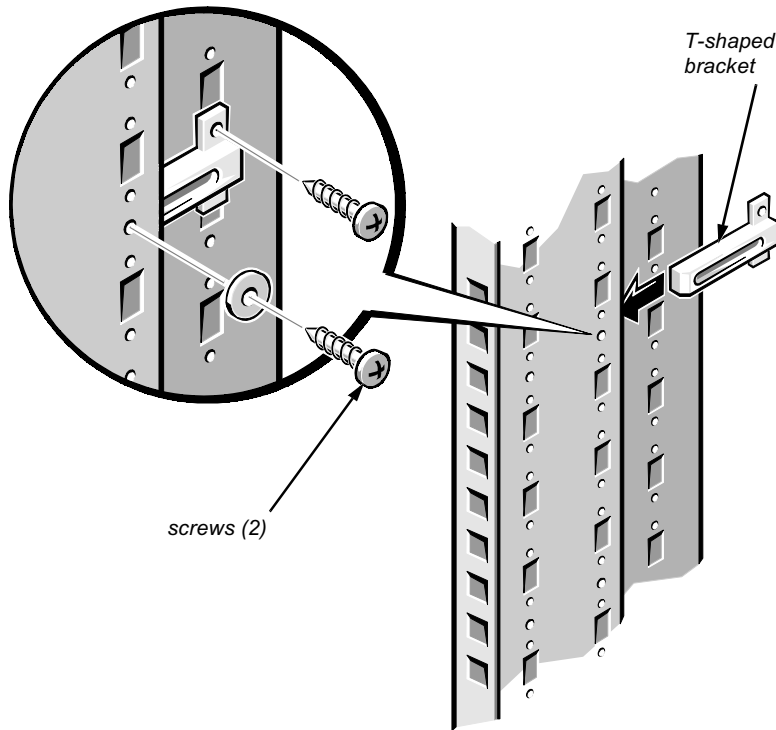


Figure 6. Relocating the T-Shaped Brackets

4. Using a Phillips screwdriver, slightly loosen the two screws that hold the back slide-mounting bracket to the exterior slide (see Figure 7).

*NOTE: Do **not** adjust the front slide-mounting brackets. Doing so will prevent the tray from aligning properly with the rack. Make adjustments only to the back slide-mounting brackets.*

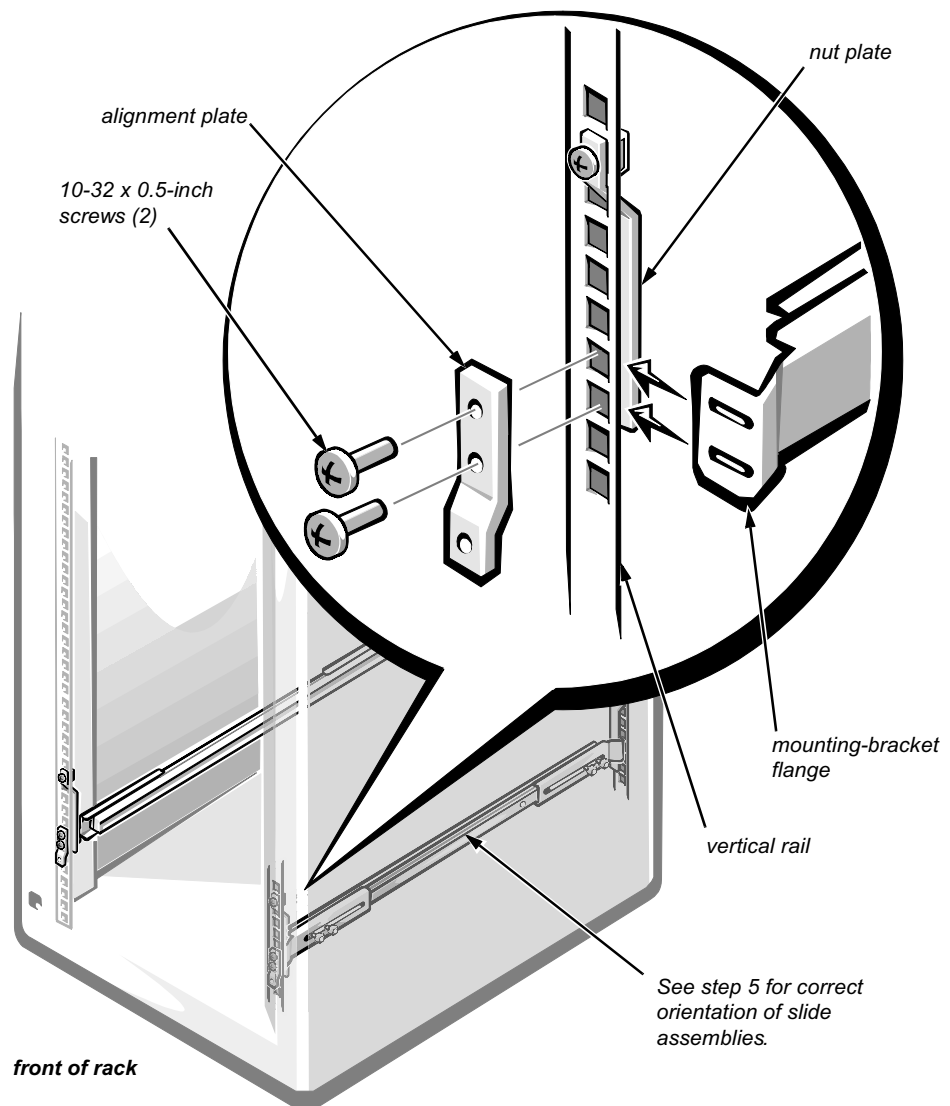


Figure 7. Installing the Slide Assemblies

5. Install the slide assembly in the rack:

NOTES: When installing the slide assemblies, be sure that the green plastic stops at the ends of the channels are at the back of the rack and that the green push button (on the interior slide) is near the front of the rack.

If the slide assembly is completely extended and locked in position, press the spring located on the inside of the interior slide (near the end with the green plastic stop) to release the slide so that it can be returned to the retracted position.

- Insert the slide's mounting-bracket flanges between the nut plates and the rack's vertical rails as shown in Figure 7.
- Position the mounting bracket at the back of the slide assembly so that its two slots are aligned with the two lowest holes in the nut plate (see Figure 7). Secure the mounting bracket with two 10-32 x 0.5-inch

Phillips screws and two #10 flat metal washers. Do *not* completely tighten the two mounting screws until you install the tray and verify that the width between the slide assemblies is correct.

- c. Insert a 10-32 x 0.5-inch Phillips screw through the alignment plate. Position the mounting bracket at the front of the slide assembly so that its two slots are aligned with the two lowest holes in the nut plate, and install the alignment plate (see Figure 7). Secure the alignment plate and mounting bracket using a second 10-32 x 0.5-inch Phillips screw.
- d. If necessary, adjust the slide assembly's length until the mounting-bracket flanges fit snugly against the back of the rails on both ends as shown in Figure 8. (Dell racks require no adjustment to the slide assemblies; the mounting brackets are preconfigured to the correct length).

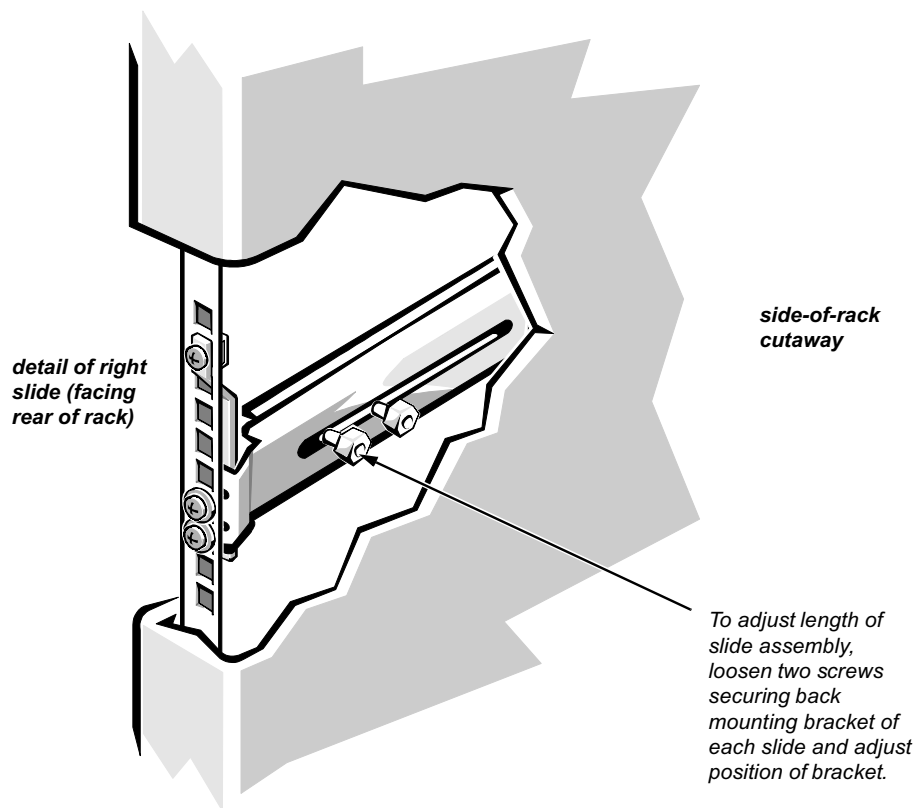


Figure 8. Adjusting the Length of the Slide Assemblies

- e. Pull the interior slide out until you have access to the two back mounting-bracket screws and nuts (see Figure 8). Tighten the two mounting-bracket screws.
 - f. Push the interior slide back in to the retracted position.
- 6. Repeat steps 3 through 5 to install the second slide assembly.**

Installing the Cable-Management Arm-Mounting Bracket

Use the following procedure to install the cable-management arm-mounting bracket on the tray:

1. **Position the cable-management arm-mounting bracket as shown in Figure 9.**

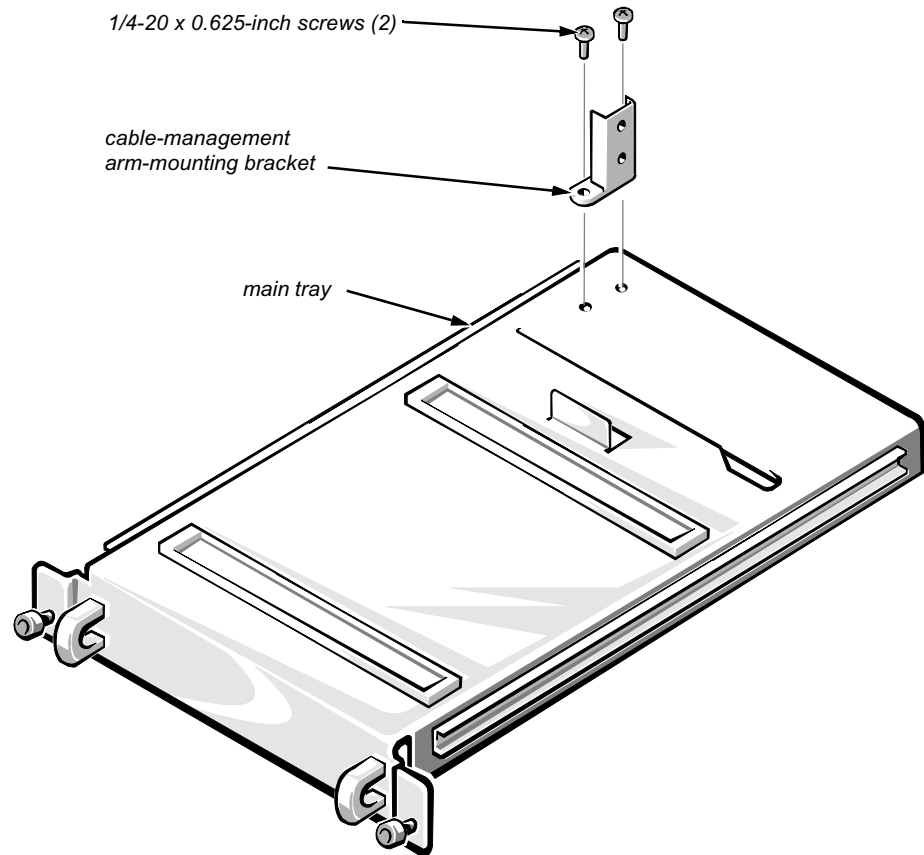


Figure 9. Installing the Cable-Management Arm-Mounting Bracket

2. **Secure the cable-management arm-mounting bracket to the tray with two 1/4-20 x 0.625-inch Phillips screws.**

Installing the Main Tray in the Rack

Use the following procedure to install the tray in the rack.

WARNING: To prevent personal injury, use two people to lift the tray and hold it in position while inserting the tray's rails into the slides on each side.

1. **Extend the two interior slides out of the rack until they lock in the extended position.**

2. Lift the main tray into position, and insert the tray's built-in rails into the channels of the interior slides (see Figure 10).

The slotted holes in the slide-mounting brackets (see Figure 7) allow for adjustment if the width between the slide assemblies is not correct. Adjust the width so that the tray slides into place easily.

NOTE: You will feel resistance as the rails thread themselves into the ball-bearing cages in the slide assemblies—this is normal. Continue to push the tray inward until it slides completely into the rack and is fully seated. (You may have to pull the main tray partially out and push it back into the rack to fully thread the ball-bearing cages.) When fully engaged, the back of the captive thumbscrews in the main tray should mate with the alignment plates on the rack's front vertical rails.

As you pull the tray out to its furthest extension, the tray will lock in the extended position. To push the tray back into the rack, press the green buttons near the front of both interior slides (see Figure 10) and simultaneously push in on the tray.

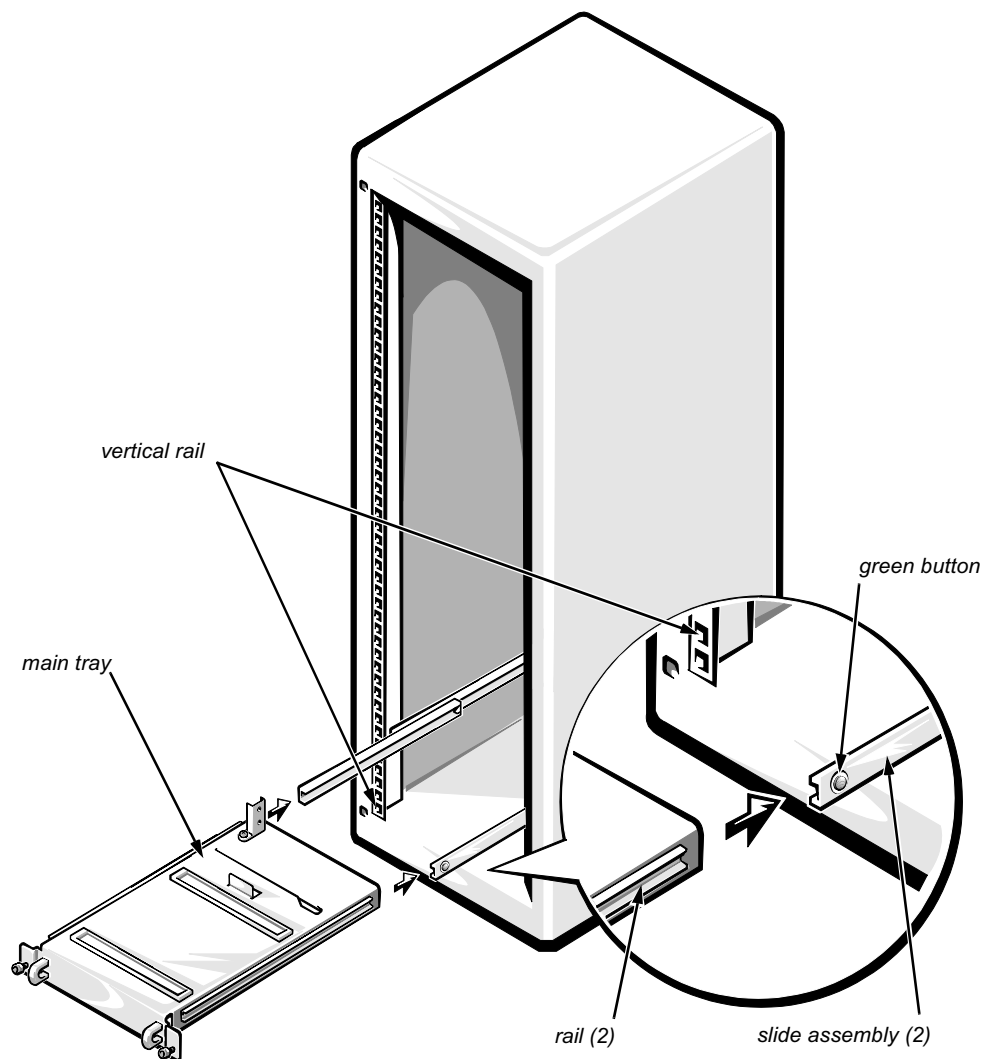


Figure 10. Installing the Main Tray in the Rack

3. Tighten all eight of the slide-assembly mounting screws securely.

After you tighten all of the mounting-bracket screws, slide the tray in and out a few times to ensure that none of the adjustments changed as you tightened the screws.

Installing the Cable Management Arm

Use the following procedure to install the cable management arm onto the cable-management arm-mounting bracket. Perform this procedure from the back of the rack.

- 1. Fully extend the main tray from the rack.**
- 2. Install the cable management arm on the cable-management arm-mounting bracket.**

Secure the cable management arm to the mounting bracket with two 1/4-20 x 0.625-inch Phillips screws and two 1/4-20 flat metal washers (see Figure 11).

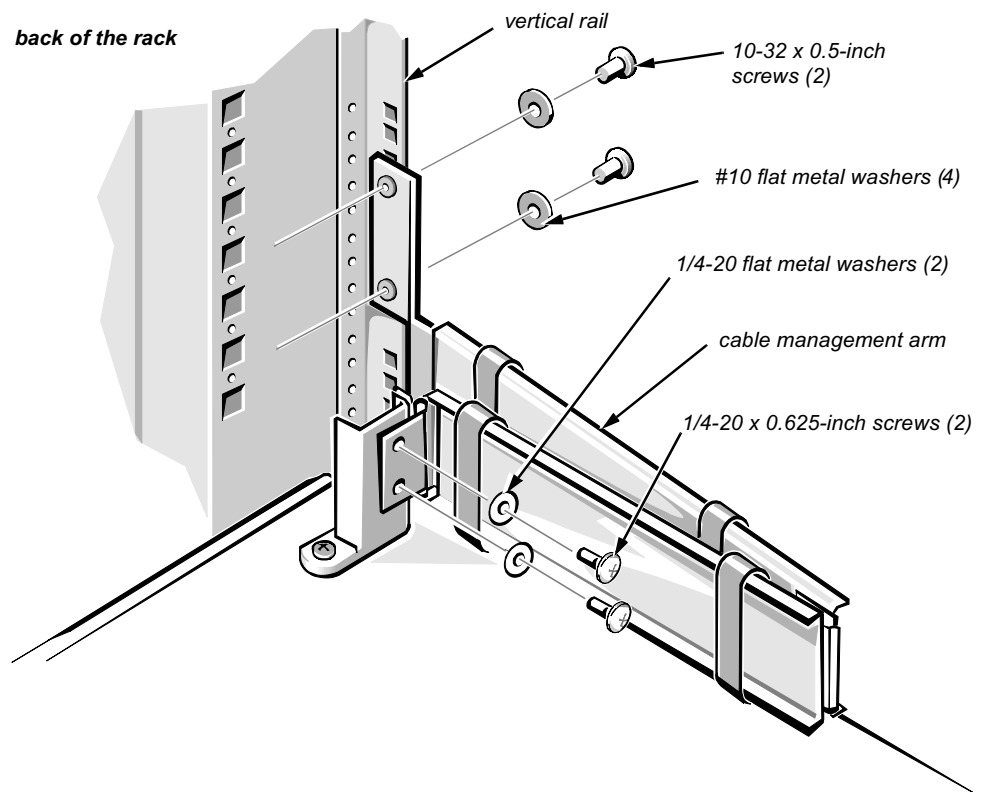


Figure 11. Installing the Cable Management Arm

- 3. Secure the loose end of the cable management arm to the back vertical rail (see Figure 11).**

Use two 10-32 x 0.5-inch Phillips screws and two #10 flat metal washers to secure the cable management arm to the back vertical rail as shown in Figure 11. This is the rail on the right side as you face the back of the rack.

Installing the Transverse Tray

Follow these steps to install the transverse tray onto the main tray:

NOTE: This task requires two people—one to support the hinge plate and one to guide the transverse tray into position.

1. Fully extend the main tray from the rack.
2. While holding the transverse tray adjacent to the main tray, align the slides on the underside of the transverse tray with the rails on the top of the main tray (see Figure 12).

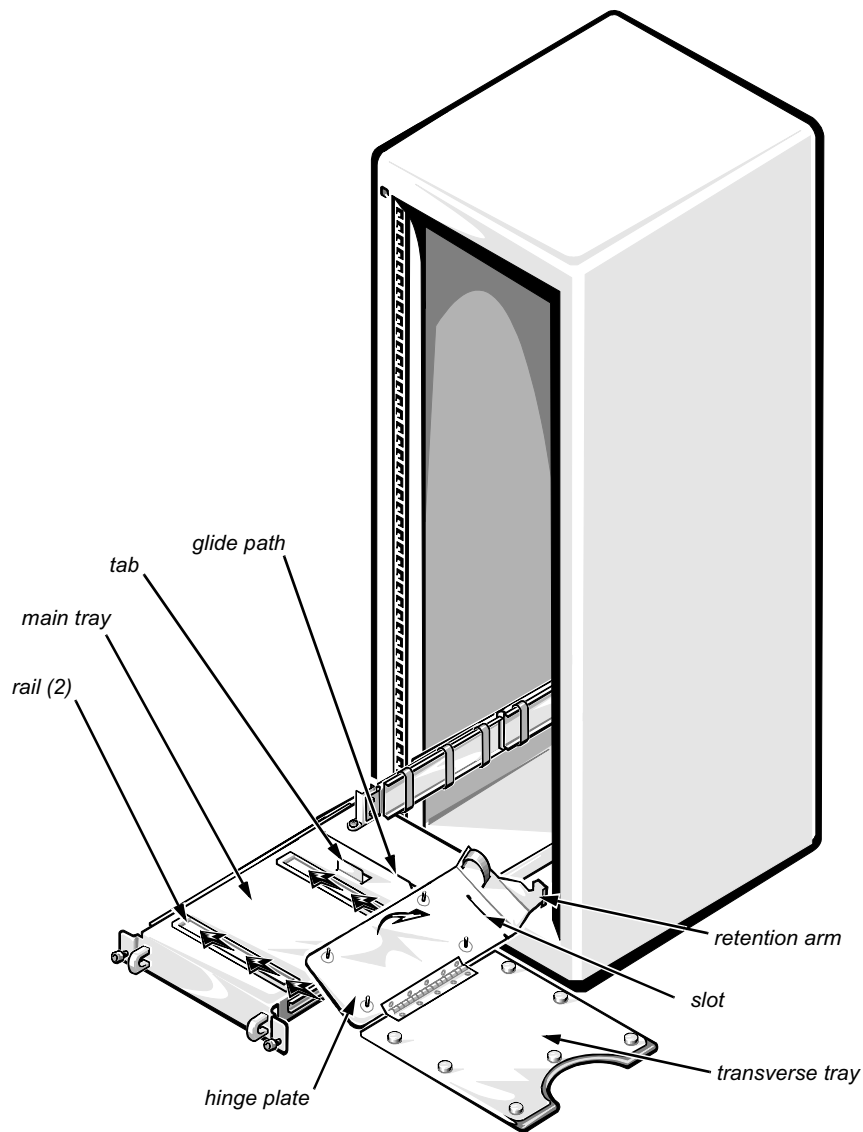


Figure 12. Installing the Transverse Tray

3. Install the transverse tray onto the main tray (see Figure 12).

Position the hinge plate at a slight angle so that the retention arm does not interfere with the main tray, and slide the transverse tray onto the main tray. You will feel resistance as the rails thread themselves into the ball-bearing cages in the slide assemblies. When the rails are fully threaded into the slides, a flat retaining spring will click into place at the open end of each slide.

4. While holding the hinge plate at a right angle to the transverse tray, slide the transverse tray back towards you as far as possible.

5. Lower the hinge plate to a horizontal position, making sure that the tab on the main tray engages the slot in the hinge plate (see Figure 12).

Installing the PowerEdge 2100 or 2200 System in the Rack

Use the following procedure to install a PowerEdge 2100 or 2200 system in the rack.

WARNING: The computer weighs approximately 17.7 kg (39.0 lb) when fully loaded. To prevent personal injury, use two people to lay the computer on its side so you can remove the computer's feet in the following procedure.

WARNING: If you are installing more than one computer, install the first computer in the lowest position in the rack. Never pull more than one computer out of the rack at a time.

1. Remove the computer cover.

See Chapter 6, "Working Inside the Computer," in the computer's *User's Guide* for instructions on removing the computer cover.

2. Remove any expansion cards that interfere with access to the floor of the chassis.

See Chapter 7, "Installing System Board Options," in the *User's Guide* for instructions on removing expansion cards.

3. Remove the feet from the computer.

- a. Lay the computer on its side on a piece of foam or cardboard (to prevent damage to the computer) while you remove the feet.
- b. From inside of the computer chassis, press the plastic rivet out from the center of each foot with a pen or small screwdriver.
- c. From outside of the chassis, pull each foot from the chassis.

4. Set the computer in the tray.

WARNING: Be sure that the rack has all three stabilizer feet installed to prevent it from tipping over when you place the weight of the computer on the extended tray.

To prevent personal injury, use two people to lift the computer onto the tray. Be sure to use proper lifting techniques to prevent back injury.

If necessary, remove the four 8-32 knurled nuts from the four threaded studs on the hinge plate. Using two people, lift the computer up over the tray and position it so that the four threaded studs on the hinge plate fit into the holes where the feet were installed on the bottom of the chassis. Then set the computer down on the threaded studs (see Figure 13).

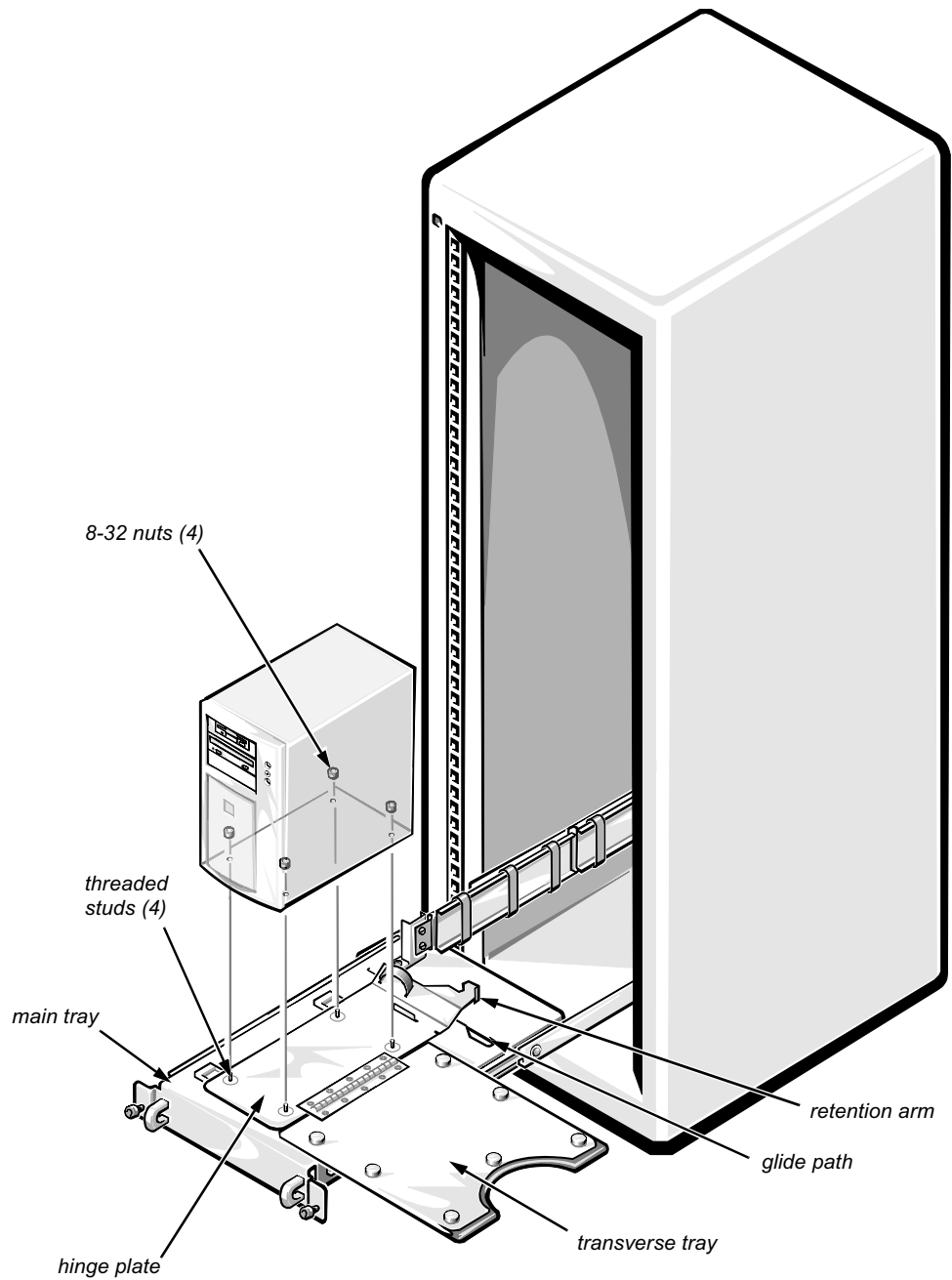


Figure 13. Installing the PowerEdge System in the Tray

- 5. Secure the computer to the hinge plate using the four 8-32 knurled nuts.**
- 6. If you removed any expansion cards from the computer in step 2, replace the cards now.**
- 7. Replace the computer cover.**

See Chapter 6, “Working Inside the Computer,” in the *User’s Guide* for instructions on replacing the computer cover.

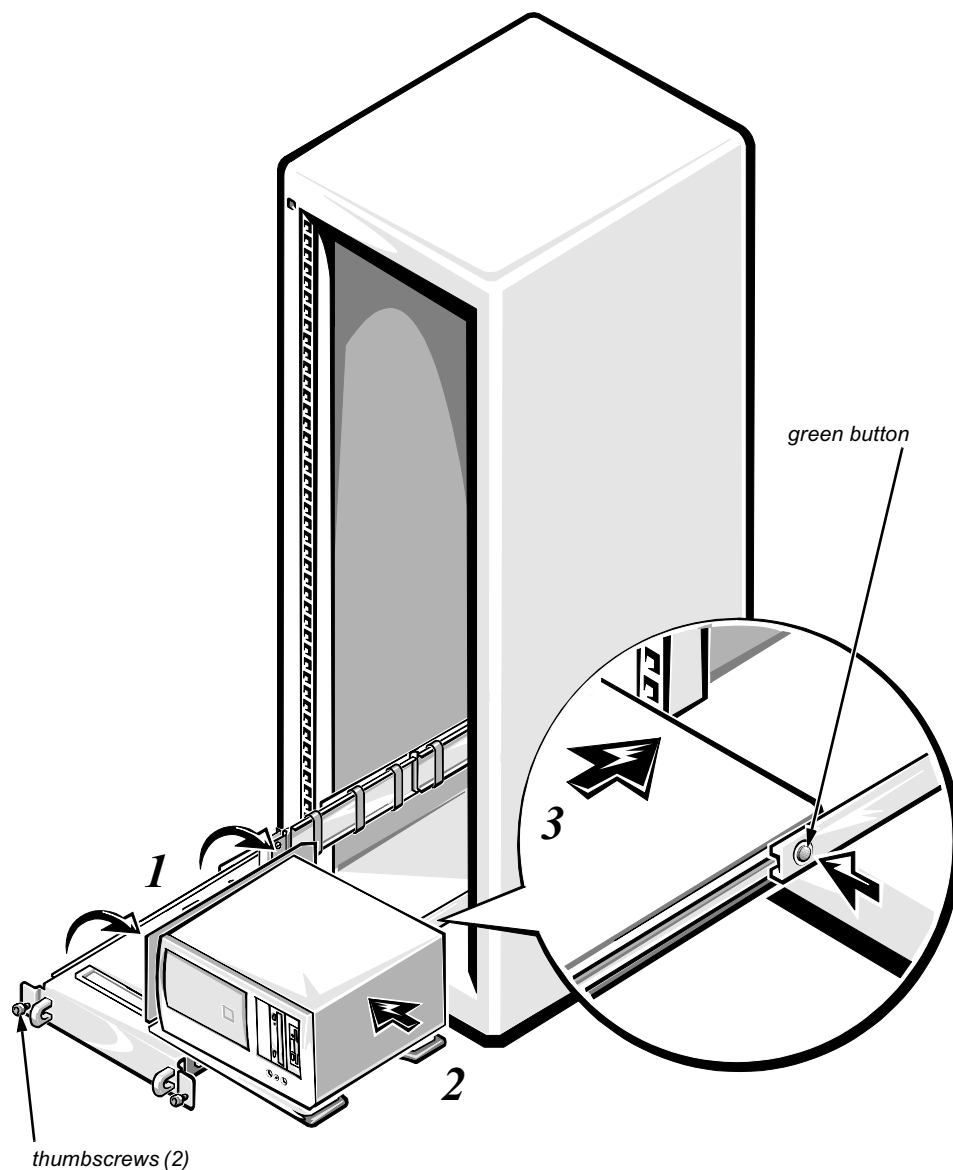


Figure 14. Loading the Computer Into the Rack

8. Carefully rotate the computer to a horizontal position on the transverse tray (see Figure 14, step 1).



WARNING: To avoid personal injury, avoid placing your hands on the upper surface of the transverse tray or main tray while rotating, sliding, or moving the computer.

Before moving the transverse tray in the next step, make sure that the retention arm on the hinge plate is properly inserted into the glide path in the main tray (see Figure 13).

9. Slide the transverse tray to the left until it reaches its limit of travel (Figure 14, step 2).

10. Slide the main tray back into the rack (see Figure 14, step 3).

NOTE: In its fully-extended position, the tray will be locked. To release the tray, press the green button near the front of each interior slide and simultaneously push in on the main tray.

11. Tighten the captive thumbscrews at the front of the main tray to lock the computer in position.

12. Install the cables.

Connect the cables to the back of the computer, and route them along the cable management arm. Secure the cables with the Velcro strips attached to the cable management arm and hinge plate.

13. Using two people, replace the rack's front and back doors as follows:

- a. Lift the front door into position, and align the hinges with the holes in the rack as shown in Figure 3.
- b. Slide the hinges into the holes in the rack until the hinge release levers lock the hinges into position.
- c. Close the door latch by rotating the handle counterclockwise until it stops, push the handle in until it locks in position, and then slide the cover down over the push button (see Figure 2).
- d. Repeat steps a through c to install the back door.

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