

Dell™ PowerEdge™ 4210 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.

Information in this document is subject to change without notice.

© 2002 Dell Computer Corporation. All rights reserved.

Reproduction in any manner whatsoever without the written permission of Dell Computer Corporation is strictly forbidden.

Trademarks used in this text: *Dell*, *PowerEdge*, and the *DELL* logo are trademarks of Dell Computer Corporation.

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell Computer Corporation disclaims any proprietary interest in trademarks and trade names other than its own.

March 2002 P/N 7N141 Rev. A00

Contents

- Safety Instructions 1-1**
- Installation Instructions 1-2**
 - Rack Requirements 1-2
- Rack Installation 1-2**
 - Before You Begin. 1-2
 - Installation Tasks. 1-4
 - Recommended Tools and Supplies. 1-4
 - Provided Tools 1-4
 - Removing and Replacing the Rack Doors. 1-4
 - Removing the Front Door 1-5
 - Replacing the Front Door 1-6
 - Opening and Removing the Back Doors. 1-6
 - Replacing the Back Doors 1-8
 - Removing the Side Panels 1-8
 - Replacing the Side Panels 1-10
 - Reversing the Front Door (optional) 1-10
 - Securing the Rack Leveling Feet. 1-14
 - Installing the Rack Stabilizer Feet 1-16
 - Routing Cables. 1-19
- Coupling Two Racks 1-20**

Index

Figures

Figure 1-1. Removing the Front Door. 1-5

Figure 1-2. Opening the Left Back Door. 1-7

Figure 1-3. Removing the Back Doors 1-8

Figure 1-4. Removing a Side Panel 1-9

Figure 1-5. Removing the Front-Door Hinges 1-11

Figure 1-6. Reversing the Top and Bottom Hinges 1-12

Figure 1-7. Rotate Front Door. 1-13

Figure 1-8. Adjusting the Leveling Feet 1-15

Figure 1-9. Attaching the Front Stabilizer Foot 1-17

Figure 1-10. Attaching the Side Stabilizer Foot 1-18

Figure 1-11. Cable-Routing Options. 1-19

Figure 1-12. Rack Coupling Kit. 1-20

Figure 1-13. Installing the Hexagonal Spacers. 1-21

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.


 **CAUTION:** For complete safety and regulatory information, refer to your *System Information* document.

 **CAUTION:** 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 cabinet evaluated for suitability by a certified safety agency. The manufacturer disclaims all warranties and liability in connection with such combinations.

 **CAUTION:** 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.


- 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, 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 a 42-unit (U) rack. Information includes assembling the rack, coupling two 42-U racks, and routing cables through the rack. The 42-U rack can be installed using the recommended tools.



Rack Requirements


-  **NOTICE:** The 42-U rack 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.


Rack Installation

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

Before You Begin


-  **CAUTION:** Before you begin installing your rack, carefully read "Important Safety Information," 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.

 **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.


 **CAUTION:** Do not attempt to move your rack with components installed. If you move a fully loaded rack on a slightly uneven floor surface, the rack may become unstable and tip over.


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.

Installation Tasks

Installing a rack cabinet involves performing the following tasks:

- 1 Removing and replacing the rack doors
- 2 Removing and replacing the side panels
- 3 Reversing the front door and badge (optional)
- 4 Securing the leveling feet
- 5 Installing the stabilizer feet
- 6 Routing cables through the rack
- 7 Coupling two racks (optional)

Recommended Tools and Supplies

You may need the following tools and supplies to install the rack:

- #1 Phillips screwdriver
- #2 Phillips screwdriver
- 12-mm wrench
- Needle-nose pliers
- 4-mm Allen wrench (if you want to reverse the direction that the front door opens)
- 6-mm Allen wrench

Provided Tools

The following tool is provided: 4-mm Allen wrench.

Removing and Replacing the Rack Doors




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.

Removing the Front Door

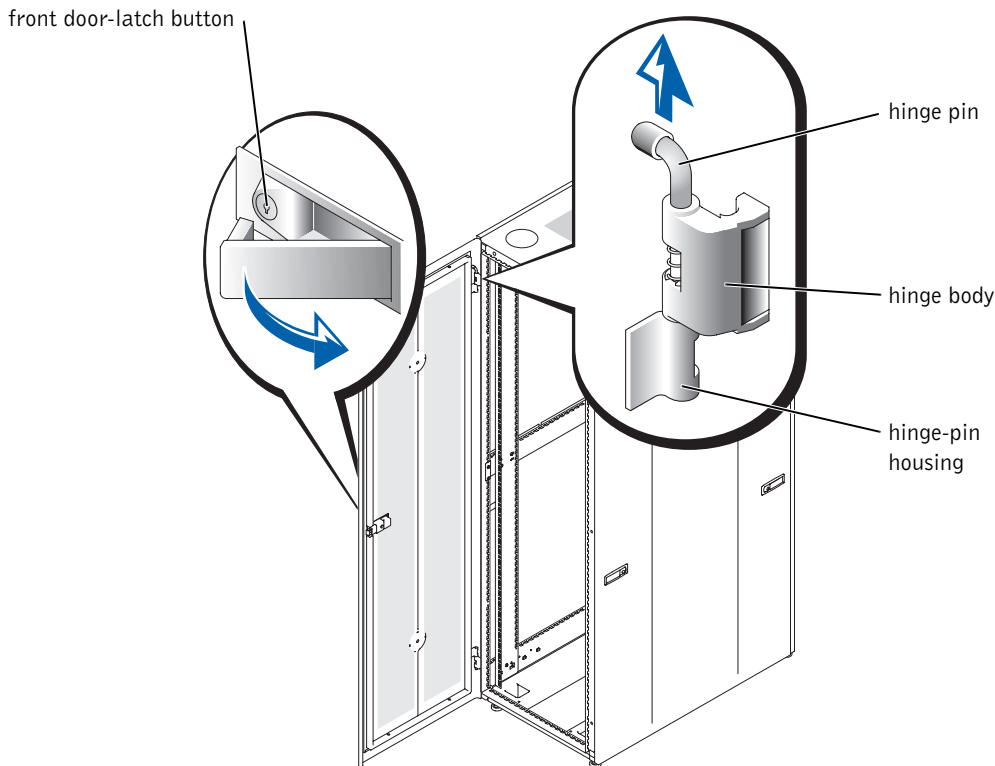
- 1 Open the front door all the way (see Figure 1-1).

 **NOTE:** The front door, right back door, and side panels all have the same type of door latch.

- 2 While holding the door, pull the top hinge pin upward so that it clears the door's hinge-pin housing (see Figure 1-1).

The hinge pin's retention clip prevents the hinge from being pulled out of the hinge body.

Figure 1-1. Removing the Front Door



- 3 While holding the hinge pin out of the door's hinge-pin housing, pull the door slightly away from the rack so that the door clears the hinge body.
- 4 Release the hinge pin.

- 5 Lift the door upward so that the door clears the bottom hinge post.



CAUTION: Due to the size and weight of the door, it is recommended that you lay the removed door flat with its outer surface facing upward.

- 6 Lay the panel in a safe location with the panel's outer surface facing upward.

Laying the door flat with the outer surface facing upward will help prevent damage to the door's cosmetic coating.

Replacing the Front Door

To replace the front door, perform the steps for removal in reverse.

Opening and Removing the Back Doors



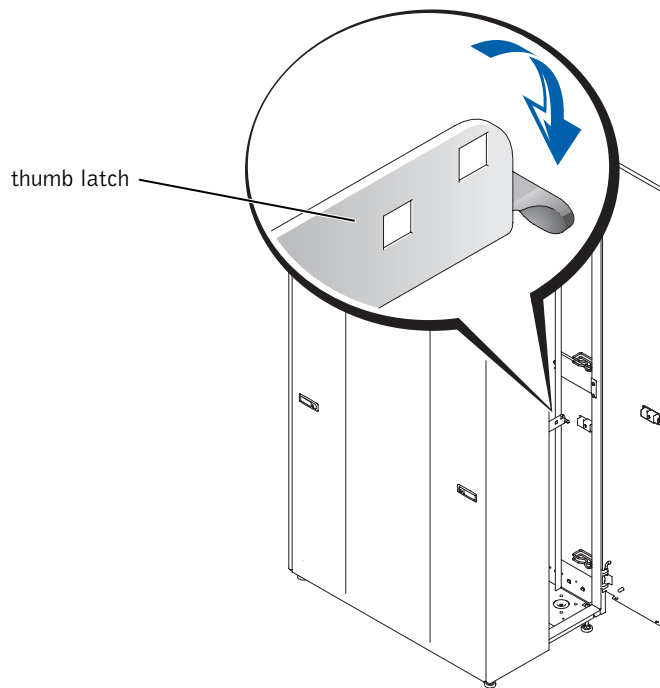
CAUTION: Because of the size and weight of the rack cabinet doors, never attempt to remove or install them by yourself.



NOTE: The front door, right back door, and side panels all have the same type of door latch.

- 1 Open the back doors.
 - a Press the door-latch button to release the right door handle (see Figure 1-1).
 - b Open the right door.
 - c Press the left door's thumb latch until the left door is released (see Figure 1-2).
 - d Open the left door.

Figure 1-2. Opening the Left Back Door

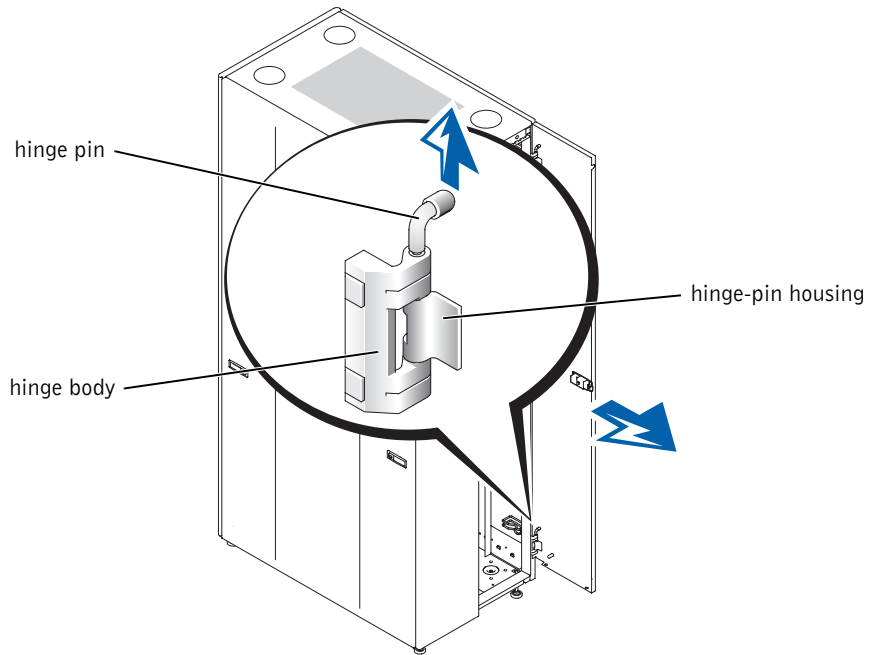


2 Remove the right door.

- a** While supporting the door, pull the pin for the top hinge out of the door's hinge-pin housing (see Figure 1-3).

You will hear a click as you pull the pin out of the door's hinge-pin housing. The hinge pins are designed to prevent them from being pulled out of the hinge body.

- b** Repeat step a for the bottom hinge.
- c** Pull the door away from the rack.

Figure 1-3. Removing the Back Doors

⚠ CAUTION: Due to the size and weight of the door, it is recommended that you lay the removed door flat with its outer surface facing upward.

- d Lay the door in a safe location with the door's outer surface facing upward.
Laying the door flat with the outer surface facing upward will help prevent damage to its cosmetic coating.
- e Repeat steps a through d for the left door.

Replacing the Back Doors

To replace the back doors, perform the steps for removal in reverse.

Removing the Side Panels

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



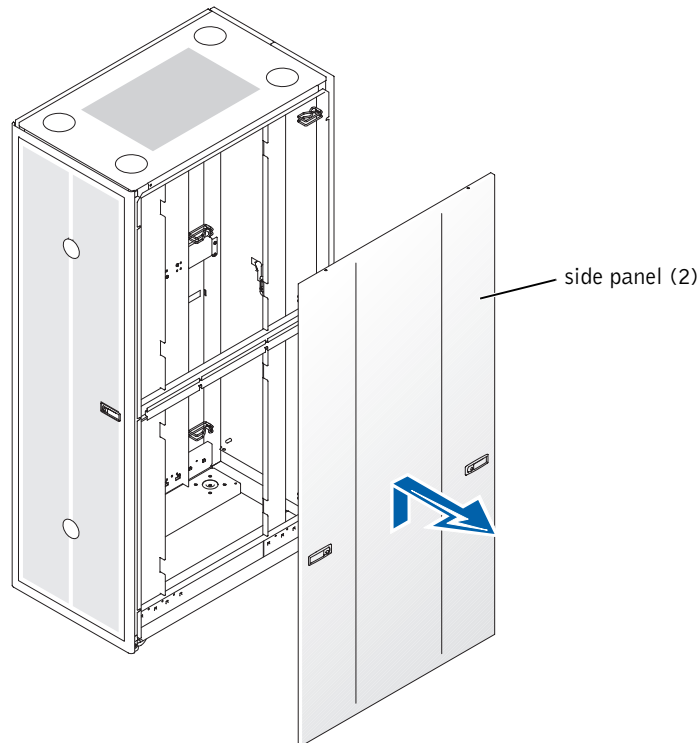
NOTE: You must remove the side panels in order to install the side stabilizer feet. Also, although removing the side panels is not mandatory for installing systems in a rack, having the sides open makes it easier to install slide assemblies and support rails and to reverse the direction that the front door opens.

- 1 Press the latch buttons to release the left and right handles.

The latches on the side panels are identical to the ones on the front door and the right back door.

- 2 Allow the side panel to swing outward slightly from the bottom.
- 3 Grasp the panel firmly on each side.
- 4 Lift the panel upward until it clears the top of the rack (see Figure 1-4).

Figure 1-4. Removing a Side Panel



- 5 Pull the side panel away from the rack.



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

- 6 Place the panel in a safe location with the panel's outer surface facing upward.

Placing the panel with the outer surface facing upward helps prevent damage to its cosmetic coating.

- 7 Repeat steps 1–6 for the other side panel.

Replacing the Side Panels



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

To replace the side panels, perform the removal steps in reverse.

Reversing the Front Door (optional)

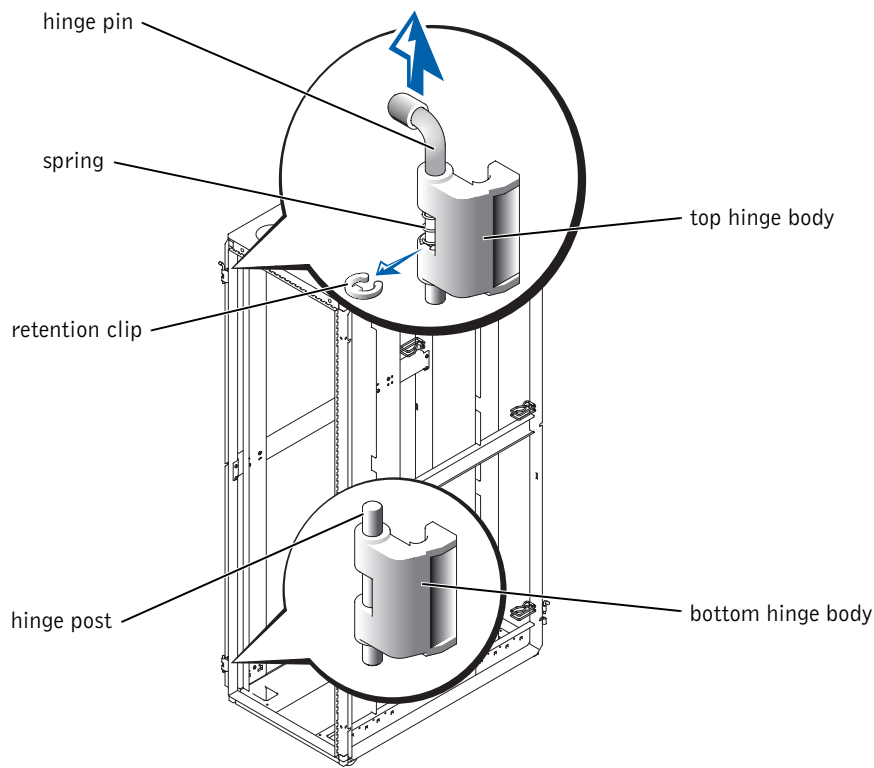


NOTE: Use the 4-mm Allen wrench provided with the rack to remove the front-door hinge bodies from the rack and reinstall them on the side opposite their original positions. You might need a stepladder in order to access the Allen bolt that secures the top hinge body to the rack.

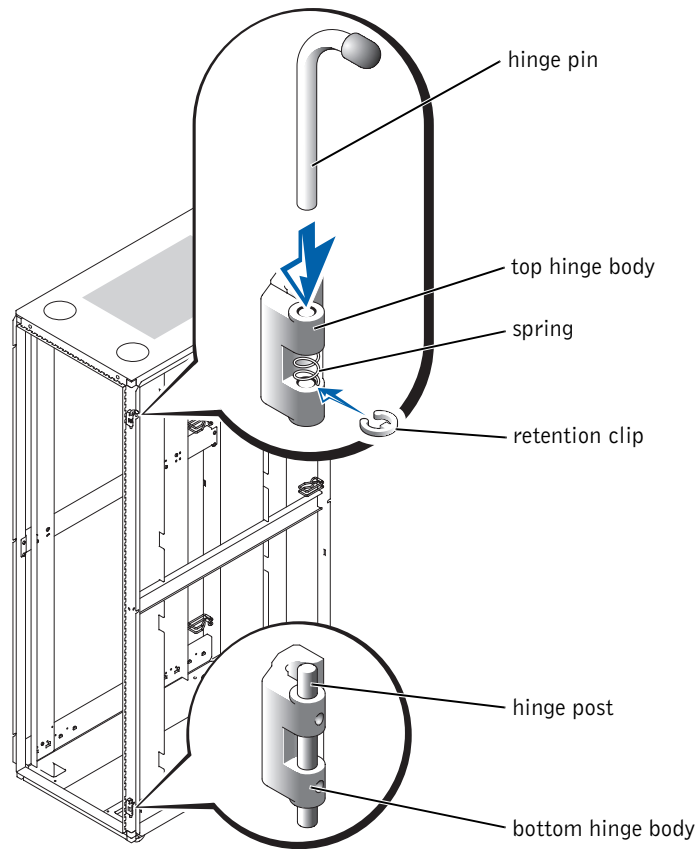
To reverse the direction that the front door opens, complete the following steps:

- 1 Remove the front door. For instructions, see "Removing the Front Door."
- 2 Remove the side panels. For instructions, see "Removing the Side Panels."
- 3 Reverse the top hinge body.
 - a Pull the hinge pin upward slightly so that you can access the retention clip (see Figure 1-5).
 - b Using the needle-nose pliers, remove the retention clip, and slide the hinge pin out of the hinge body.

Figure 1-5. Removing the Front-Door Hinges



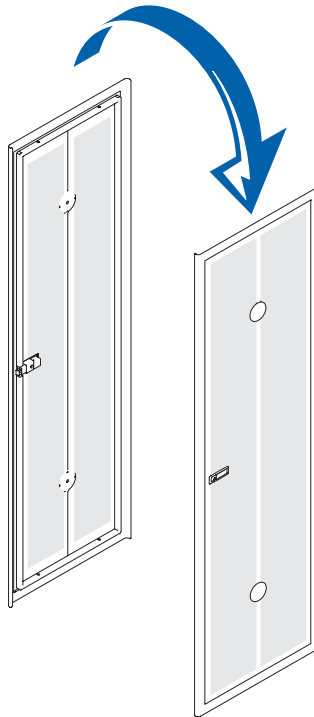
- c** Remove the hinge spring from the hinge body.
- d** Place the hinge pin, retention clip, and spring in a safe location.
- e** Using the 4-mm Allen wrench, remove the Allen bolt that secures the hinge body to the rack, and place the bolt with the hinge pin, retention clip, and spring.
- f** Rotate the hinge body 180 degrees so that the hinge-pin holes are now on the right side of the hinge body (see Figure 1-6).

Figure 1-6. Reversing the Top and Bottom Hinges

- g** Locate the top bolt hole in the right side of the rack, and fasten the hinge body to the right side of the rack with the Allen bolt.
 - h** Insert the spring between the top and bottom hinge-pin holes in the hinge body.
 - i** Slide the hinge pin into the hinge body.
 - j** Insert the retention clip through the hinge so that the retention clip is below the spring.
- 4** Reverse the bottom hinge body.
- a** Remove the Allen bolt that secures the hinge body to the rack, and place the bolt in a safe location.

- b** Rotate the hinge body 180 degrees so that the hinge posts are now on the right side of the hinge body (see Figure 1-6).
 - c** Locate the bottom bolt hole in the right side of the rack, and use the Allen bolt to fasten the hinge body to the right side of the rack.
- 5** Rotate the front door 180 degrees so that its hinge-pin housings are on the right side (see Figure 1-7).

Figure 1-7. Rotate Front Door



- 6** Rehang the front door by reversing the steps in "Removing the Front Door."
- 7** Reverse the lock catch.
 - a** Use the #1 Phillips screwdriver to remove the two #1 Phillips screws that hold the lock catch to the middle horizontal frame member.
 - b** Remove the lock catch and rotate it 180 degrees.

- c On the horizontal frame member that held the lock catch, reinstall one #1 Phillips screw in the bottom hole to maintain structural integrity.
- d On the other side of the rack, locate the new horizontal frame member and remove the #1 Phillips screw.



NOTE: On the new horizontal frame member there are two types of screws: a #1 Phillips screw and a Torx screw. Do not remove the Torx screw.

- e Reinstall the lock catch on the new horizontal frame member by aligning the holes of the catch with the holes of the frame member and then reinserting the two #1 Phillips screws.

8 Reverse the two logo badges on the front door.

- a Open the front door.
- b Remove the retention screw on the top logo badge with a #2 Phillips screwdriver.
- c Remove the logo badge.
- d Repeat steps b and c for the bottom logo badge.
- e Switch the logo badges and turn the text logo badge 180 degrees so that it will read correctly when reinstalled.
- f Place the text logo badge into the top circular depression so that the three tabs on the badge align with the slots near the edge of the depression.
- g Using the screws removed in step b, install the text logo badge.
- h Install the blank badge in the bottom circular depression.

Securing the Rack Leveling Feet



CAUTION: Read all statements below before you adjust the leveling feet.

Your rack includes four leveling feet, which are mounted on the corners of the rack. The leveling feet are designed to align the rack in an upright, level position when the rack is situated on a slightly uneven floor surface. Before you install your systems in the rack, deploy and adjust the leveling feet. When you level your rack, follow these guidelines.



CAUTION: When you adjust the leveling feet, ensure that the casters on each corner of the rack do not rise more than 9.5 mm (3/8 inch) above the floor. If you exceed 9.5 mm of clearance between the floor and the casters as you adjust the leveling feet, *slowly* retract the leveling feet, and then move the rack to another location that requires minimal adjustments to the leveling feet.



CAUTION: Adjust the leveling feet until each leveling foot rests firmly on the floor. Proper contact with the floor ensures that each leveling foot is supporting the weight of the rack and prevents the rack from swaying in any direction. If the leveling feet are not all in firm contact with the floor, the rack can become unstable and tip over.



CAUTION: Do not attempt to move your rack with the leveling feet deployed. Always retract the leveling feet before moving the rack. Having the leveling feet deployed when you move the rack may cause the rack to tip over.



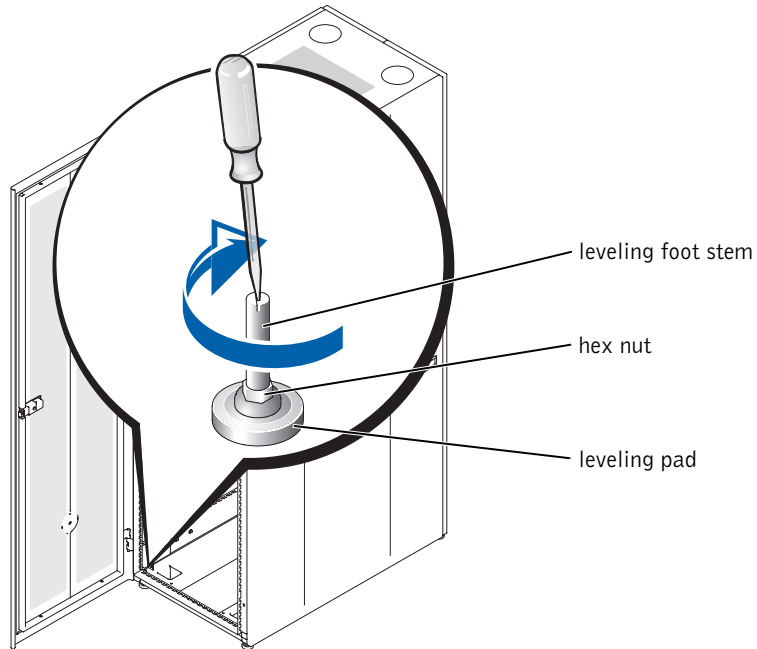
CAUTION: Always level the rack and install the stabilizing feet before you install your systems. A fully loaded rack may tip over if your rack is resting on an uneven floor surface and the leveling and stabilizing feet are not supporting the weight of the rack.



NOTE: If the rack is not leveled properly, you might not be able to install the stabilizer feet, which are necessary to prevent the rack from tipping over.

- 1 Using a screwdriver, lower the leveling foot until it rests on the floor.
- 2 If you need to lower the foot further, tighten the hex nut clockwise with a 12-mm wrench (see Figure 1-8).
- 3 Repeat steps 1 and 2 for the remaining leveling feet.
- 4 Ensure that the rack is level.

Figure 1-8. Adjusting the Leveling Feet



Installing the 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.

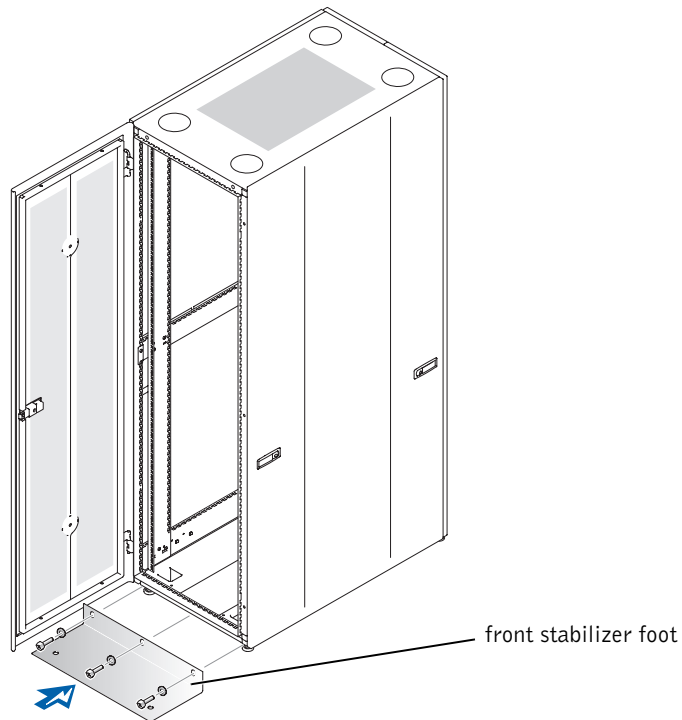
Install stabilizer feet on the rack as follows:

- Install front and side stabilizer feet on a standalone rack.
- Install front stabilizer feet on all racks in a suite, and install a left or right stabilizer foot on the racks at each end of a suite.

To install a front stabilizer foot, perform the following steps:

- 1 Open the front door.
- 2 Position the front stabilizer foot against the base of the rack frame and align its holes with the corresponding holes in the frame.
- 3 Use a 6-mm Allen wrench and the provided Allen bolts and washers to secure the front stabilizer foot to the rack as shown in Figure 1-9.

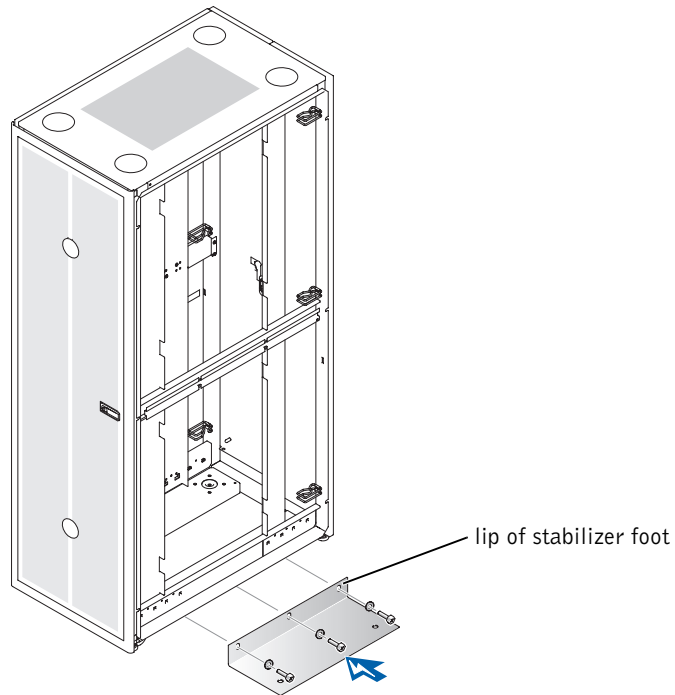
Figure 1-9. Attaching the Front Stabilizer Foot




To install a side stabilizer foot, perform the following steps:

- 1 Remove the side panel.
- 2 On the side of the rack frame's bottom rail, locate the three threaded holes (see Figure 1-10).
- 3 Slide the top lip of the side stabilizer foot under the rack, and then align its holes with the corresponding holes in the frame.

Figure 1-10. Attaching the Side Stabilizer Foot



- 4 Use the 6-mm Allen wrench, the provided washers, and the Allen bolts to secure the side stabilizer foot to the rack frame.

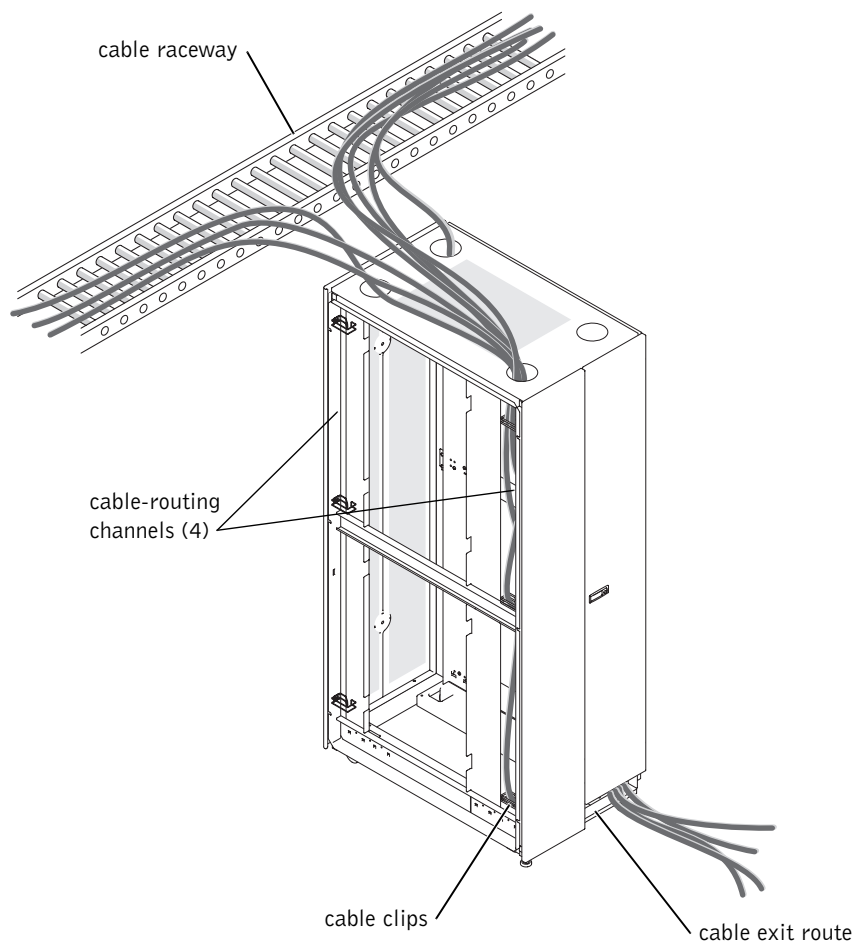
 **NOTE:** Unless you need to couple two or more racks, you may now install systems into the rack. Use the white numbered labels on the front and back of the rack mounting rails to help install products in the rack.

Routing Cables

The 42-U rack offers several features that simplify cable routing (see Figure 1-11).


- Four cable-routing channels in each rack flange allow you to route power distribution unit (PDU) power cables to the systems mounted in the rack.
- Cable clips mounted on the frame uprights keep cables out of the way and help prevent cords from becoming tangled.

Figure 1-11. Cable-Routing Options



You can route cables out of the rack in two ways:

- Through the space under the back right door (see Figure 1-11)
- Upward through the four rack ceiling holes into a cable raceway (see Figure 1-11)

 **NOTE:** To protect cables from abrasion, ensure that the plastic grommets are installed in the rack ceiling holes before routing cables to a cable raceway.

Coupling Two Racks

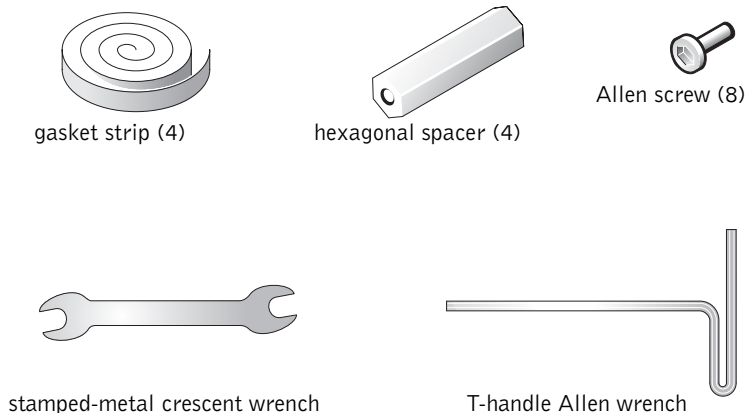
 **CAUTION:** Because of the size and weight of the rack cabinets, never attempt to couple two rack cabinets by yourself.

- 1 Unpack and set up both racks.
- 2 Unpack the coupling kit, shown in Figure 1-12.

The contents of the rack coupling kit include:

- Four gasket strips
- Four hexagonal spacers
- Eight Allen screws
- A stamped-metal crescent wrench
- A T-handle Allen wrench

Figure 1-12. Rack Coupling Kit



- 3 Remove the doors and side panels from both racks. See "Removing the Front Door," "Opening and Removing the Back Doors," and "Removing the Side Panels."
- 4 Place the gasket strips, with their protective backing removed, on one of the racks adjacent to the four locations where the hexagonal spacers will be inserted into the racks (see Figure 1-13).


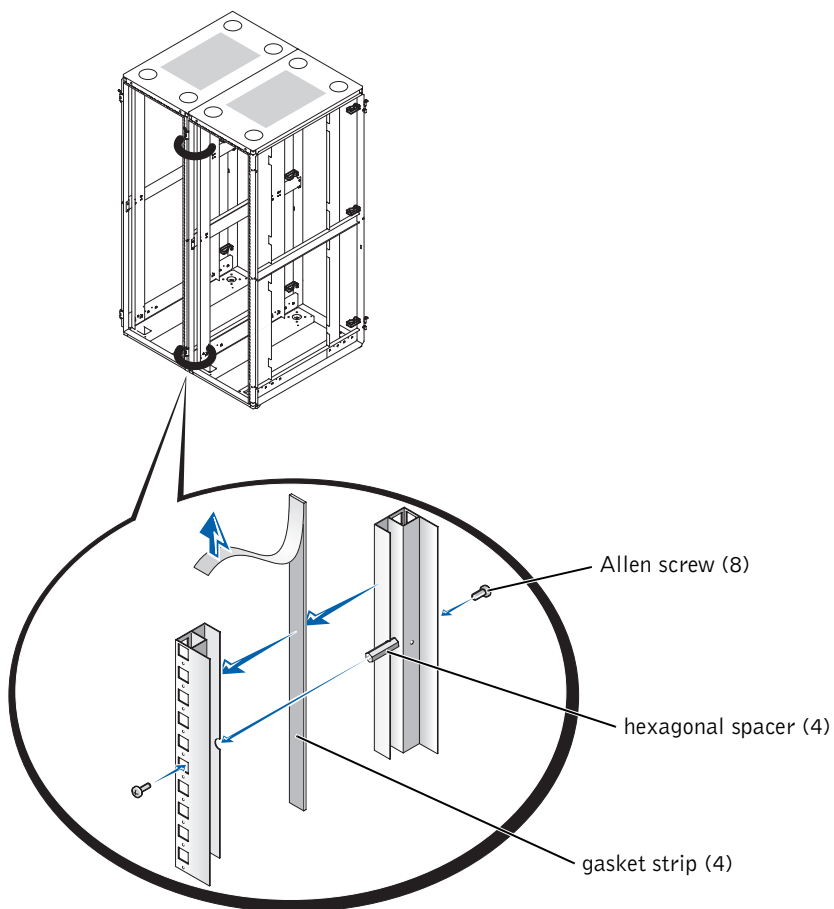
 **NOTE:** Do not cover the square holes in the rack frame with the gasket strips. It does not matter on which rack you place the gasket strips, as long as the strips protect each rack from getting scratched.

Figure 1-13. Installing the Hexagonal Spacers



- 5** Install the hexagonal spacers.
 - a** Position the two racks side-by-side.
 - b** Adjust the leveling feet on both racks so that the racks are parallel and in the same horizontal plane. For instructions, see "Adjusting the Leveling Feet."
 - c** Install the four hexagonal spacers on the front and back of the racks with the provided Allen screws, as shown in Figure 1-13.
 - d** Use the stamped metal crescent wrench to hold each hexagonal spacer in turn and tighten the coupling bolts.

Index

B

back door
 opening, 1-6
 removing, 1-7

C

cables
 routing, 1-19
coupling two racks, 1-20

D

doors
 removing, 1-4

F

front door
 removing, 1-5, 1-6

L

leveling feet, 1-14

R

rack mount precautions, 1-2
rack stabilizer feet, 1-3, 1-16
routing cables, 1-19

S

safety instructions, 1-1
side panels
 removing, 1-8, 1-10
stabilizer feet
 installing front-stabilizer
 foot, 1-16
 installing side-stabilizer
 foot, 1-18

T

tools and supplies, 1-4