

Dell™ Systems

# Rack Installation Guide



# Notes, Notices, Cautions, and Warnings



**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 potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



**WARNING:** A WARNING indicates a potentially hazardous situation which, if not avoided, may result in severe injury.

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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 Dell™ system's *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 or death 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 Dell system is safety-certified as a free-standing unit and as a component for use in a Dell rack cabinet using the Dell customer rack kit. The installation of your system and rack kit in any non-Dell 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 non-Dell rack cabinet evaluated for suitability by a certified safety agency. Dell disclaims all liability and warranties in connection with such combinations.

- System rack kits are 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 a Dell rack.
- 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 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 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 in all Dell™ 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.



**CAUTION:** Do not attempt to 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.

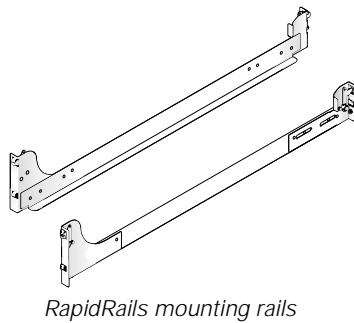


**NOTE:** If your system is a tower version, you must first convert the system to a rack version using a tower-to-rack conversion kit. Instructions for installing this kit are included in this document.

## RapidRails Rack Kit Contents

The RapidRails rack kit consists of one pair of RapidRails mounting rails (see Figure 1-1).

Figure 1-1. RapidRails Rack Kit Contents



*RapidRails mounting rails*

## Dell Rack Requirements

- ➔ **NOTICE:** 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 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.

## VersaRails Rack Kit Contents

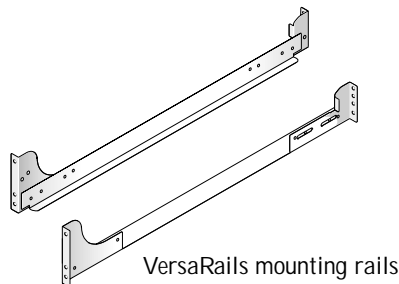
The VersaRails rack kit includes the following items (see Figure 1-2):

- One pair of VersaRails mounting rails
- Eight 10-32 x 0.5-inch 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

**T**  
10-32 x 0.5-inch  
pan-head Phillips  
screws (8)



*VersaRails mounting rails*

## Non-Dell Rack Requirements

- ➡ **NOTICE:** This rack kit is intended to be installed by trained service technicians in a rack that meets the specifications of American National Standards Institute (ANSI)/Electronic Industries Association (EIA) standard ANSI/EIA-310-D-92, International Electrotechnical Commission (IEC) 297, and Deutsche Industrie Norm (DIN) 41494. One rack kit is required for each system that is installed in a rack.

## Before You Begin

Before you install your system in the rack, read the “Safety Instructions” in the front of this document, as well as the safety instructions in your *System Information* booklet 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.

## 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 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 or death 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 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. See the documentation provided with the rack cabinet for instructions on installing and anchoring the stabilizer feet.



## Recommended Tools and Supplies

The following items make the installation easier:

- A #2 Phillips screwdriver (if installing a VersaRails kit)
- Torx T-10 driver (if installing the tower-to-rack kit)
- 3/16-inch hex-head wrench (if installing the tower-to-rack kit)

## Installation Tasks

Installing a rack kit involves the following tasks:

- 1 Removing the rack doors
- 2 Marking the rack
- 3 Installing the mounting rails in the rack
- 4 Installing the tower-to-rack conversion kit (if needed)
- 5 Installing the system in the rack
- 6 Replacing the rack doors



NOTE: The procedures that follow apply to both Dell rack cabinets and rack cabinets not manufactured by Dell unless identified as specific to one or the other.

## Removing the Rack Doors

See the procedures for removing doors in the documentation provided with your Dell 24-U and 42-U rack cabinets. If you have a Dell PowerEdge™ 4210 rack cabinet, see the procedures in the *Dell PowerEdge 4210 Rack Installation Guide*. If you have a rack cabinet not manufactured by Dell, see the manufacturer's documentation for removing doors.



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

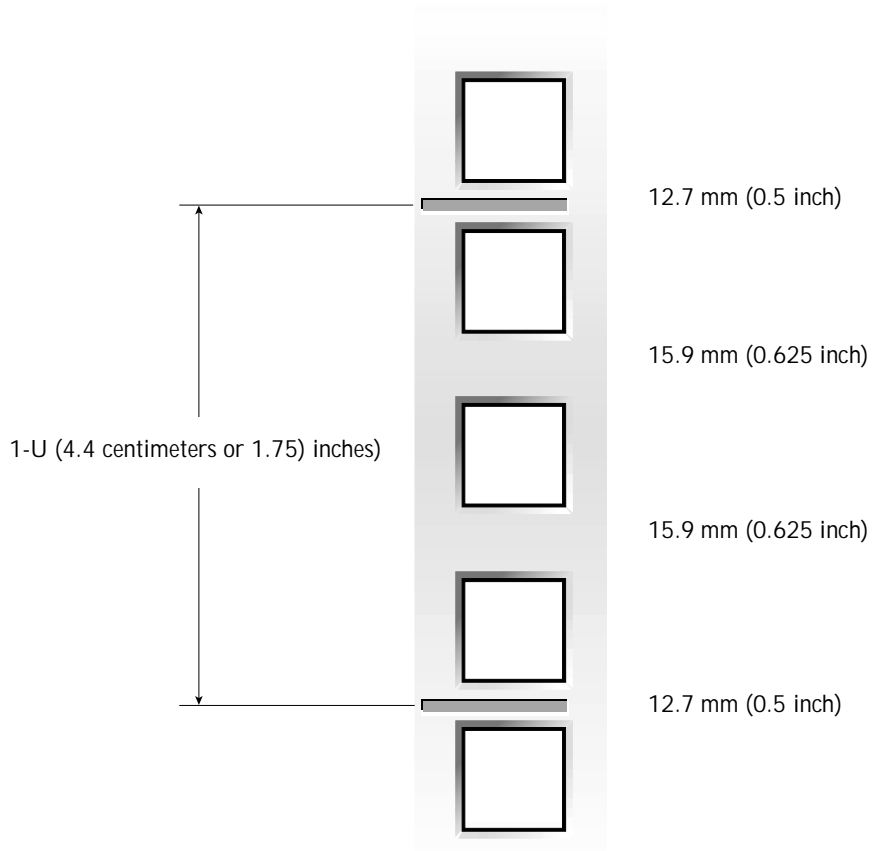
## Marking the Rack



NOTE: If you are installing a VersaRails rack kit, skip to the procedure, "Installing the VersaRails Mounting Rails."

You must allow 3-U (5.25 inches) of vertical space for each system you install in the rack. Dell rack cabinets and rack cabinets not manufactured by Dell that meet EIA-310 standards 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 rear vertical rails (see Figure 1-3).

Figure 1-3. One Rack Unit



For more information about requirements for installing components in a Dell rack, see the Dell Rack Advisor software available on the Dell website at <http://support.dell.com>.

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

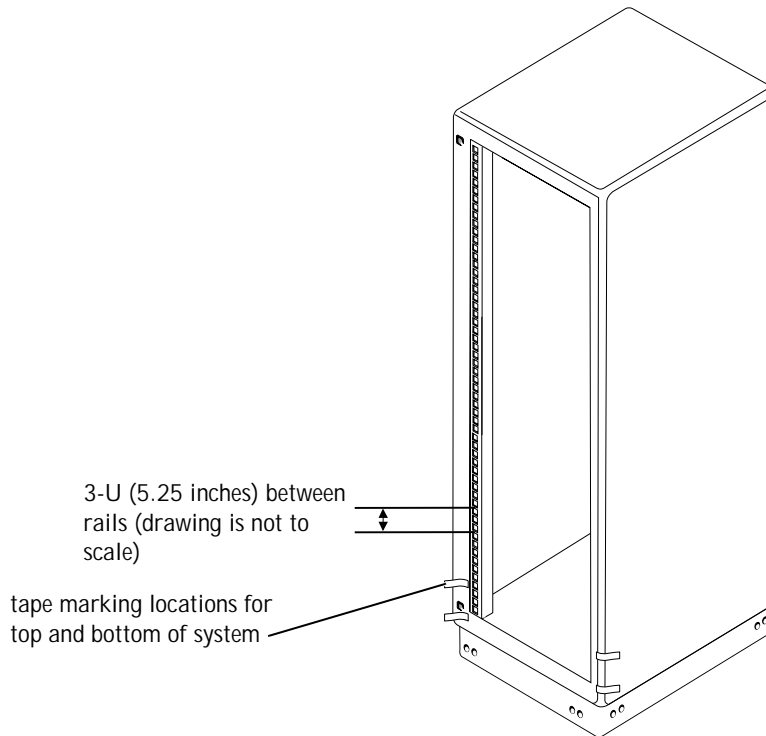
To mark the rack, perform the following steps:

- 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 space between holes (marked with a horizontal line on some rack cabinets—see Figure 1-3).

- 2 Place a mark 13.3 centimeters (5.25 inches) above the original mark (or count up nine holes in a rack that meets EIA-310 standards) and mark the rack's front vertical rails with a felt-tipped marker or place masking tape where the system's upper edge will be located (see Figure 1-4).

Figure 1-4. Marking the Vertical Rails



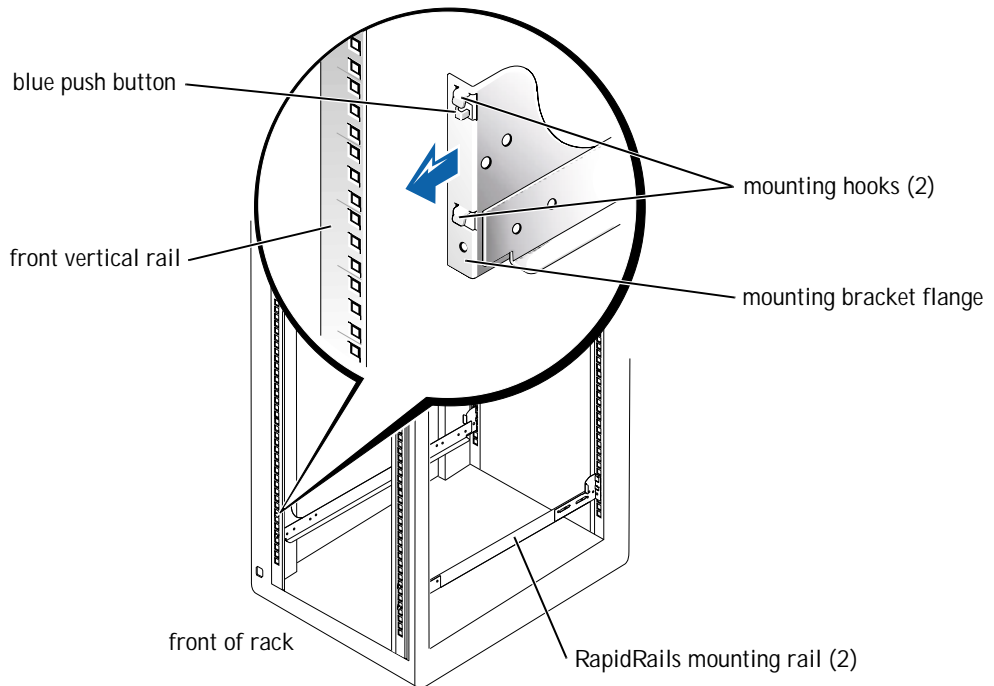
## Installing the RapidRails Mounting Rails

 NOTE: If you are installing VersaRails rails, see “Installing the VersaRails Mounting Rails.”

- 1 At the front of the rack cabinet, position one of the mounting rails so that its mounting-bracket flange fits between the marks or tape you placed on the rack (see Figure 1-5).
- 2 Align the rail mounting-bracket flange (on the front of the rail) with the square holes in the front vertical rails (see Figure 1-5).

- 3 Push the rail forward until the mounting hooks are positioned in their square holes on the vertical rail, and then push down on the mounting-bracket flange until the mounting hooks seat in the square holes, and the blue push button pops out and clicks.

Figure 1-5. Installing the RapidRails Mounting Rails



- 4 At the back of the cabinet, pull back on the mounting-bracket flange until the mounting hooks are positioned in their square holes on the vertical rail, and then push down on the mounting-bracket flange until the mounting hooks seat in the square holes, and the blue push button pops out and clicks.
- 5 Repeat steps 1 through 4 for the remaining rail 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.

# Installing the VersaRails Mounting Rails

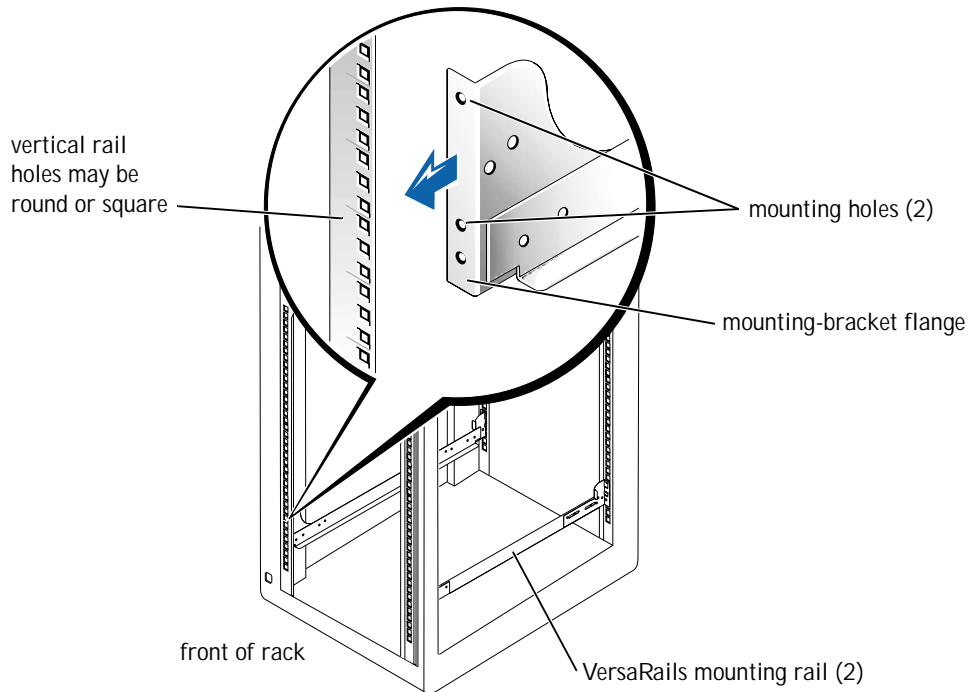


NOTE: If you have already installed RapidRails mounting rails, skip this section.

- 1 At the front of the rack cabinet, position one of the mounting rails so that its mounting-bracket flange fits at the location you have selected in the rack (see Figure 1-6).

The vertical rail holes in rack cabinets may be round or square.

Figure 1-6. Installing the VersaRails Mounting Rails



- 2 Push the mounting rail forward until the mounting holes are aligned with the holes on the front vertical rail.
- 3 Using two 10-32 x 0.5 Phillips screws, secure the front mounting-bracket flange to the front vertical rail.
- 4 At the back of the cabinet, pull back on the back mounting-bracket flange until it is aligned with the holes on the back vertical rail.

- 5 Using two 10-32 x 0.5 Phillips screws, secure the back mounting-bracket flange to the back vertical rail.
- 6 Repeat steps 1 through 5 for the remaining mounting rail on the other side of the rack.
- 7 Ensure that the mounting rails are mounted at the same position on the vertical rails on each side of the rack.

## Installing the Tower-to-Rack Conversion Kit



**NOTE:** If you have a rack-only version of the system, skip this procedure and proceed to "Installing the System in the Rack."



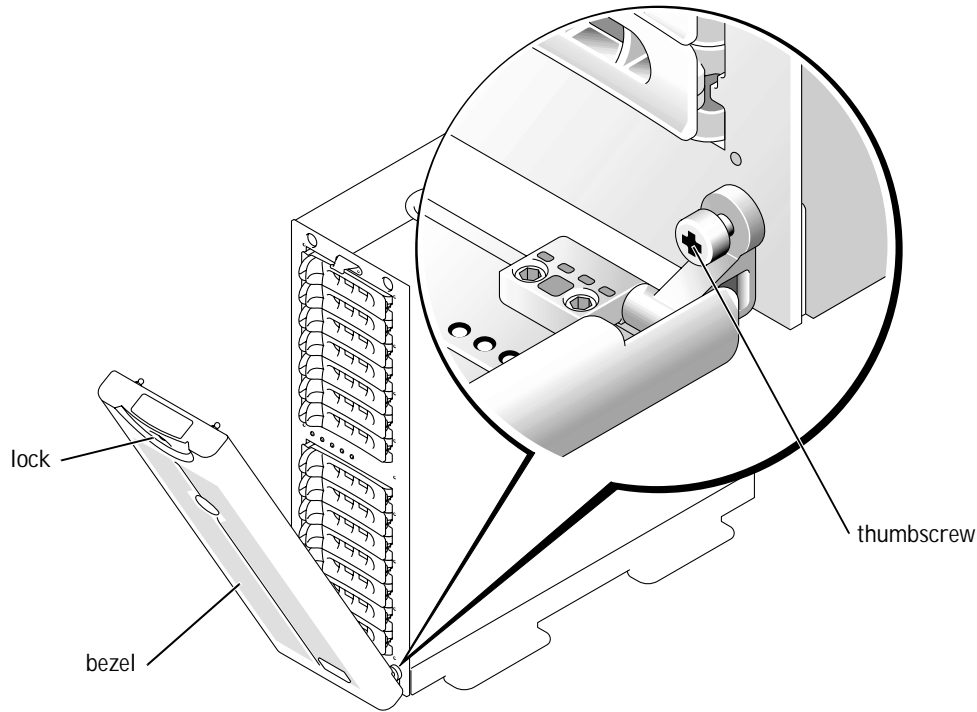
**CAUTION:** Your system may be very large and heavy. To prevent personal injury, do not attempt to move the system by yourself.

The tower-to-rack conversion kit includes a rack front panel with rack handles and thumbscrews.

### Removing the Bezel, Drives, Covers, and Front Panel

- 1 Shut down and turn off power to your system and disconnect your power and peripheral cables.
- 2 To remove the bezel (see Figure 1-7):
  - a Using the system key, unlock the front bezel.
  - b Swing the bezel away and down from the system until it is perpendicular to the system.
  - c Loosen the two thumbscrews that secure the bezel hinge to the front panel (see Figure 1-7).
  - d Pull the bezel away and set it aside.

Figure 1-7. Removing the Front Bezel



3 Label all hard drives and remove them from the system.



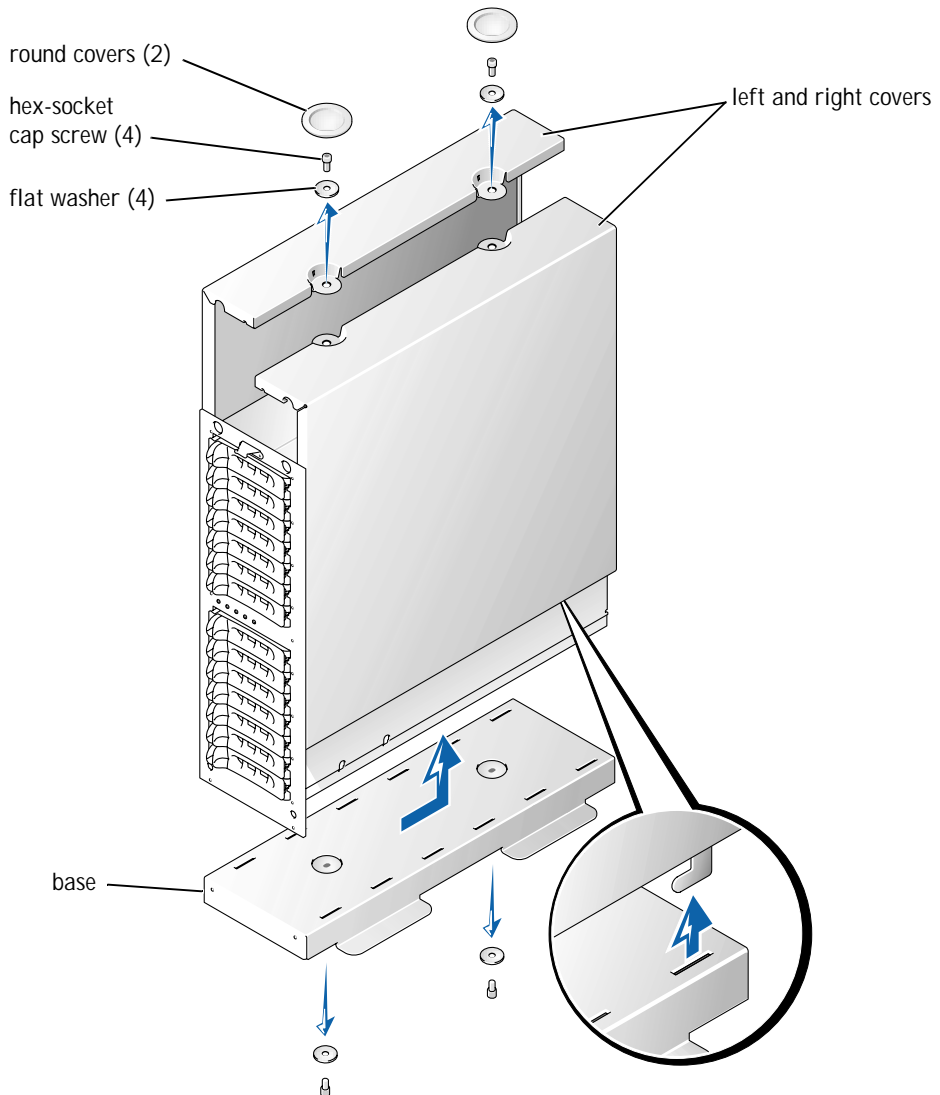
NOTE: Although it is not necessary for the conversion, you might want to remove the two power-supply and cooling modules at the back of the system chassis to reduce the weight of the chassis while you are performing this procedure (see your system *Installation and Troubleshooting Guide* for instructions for removing and replacing these modules).

4 To remove the system left and right covers (see Figure 1-8):

- a Remove the two round covers from the top of the tower system.
- b Use a 3/16-inch hex-head (Allen) wrench to remove the hex-socket cap screws and flat washers from the top of the tower system.
- c Slide the left and right cover back, away from the chassis front to disengage, and pull the covers up, away from the base to remove.

- 5 To remove the tower system base:
  - a Lay the system on its right side.
  - b Use a 3/16-inch hex-head (Allen) wrench to remove the two hex-socket cap screws and flat washers from the base of the tower chassis
  - c Remove the base and set it aside (see Figure 1-8).

Figure 1-8. Removing the Tower System Cover





- 6 To remove the tower system front panel (see Figure 1-9):
  - a Position the system so that the front panel extends about 2.5 centimeters (1 inch) beyond the edge of the table or work surface.
  - b Remove the 14 4-40 x 0.25-inch pan head black T-10 Torx screws that secure the tower front panel to the chassis.
  - c Remove the front panel from the system chassis, taking care to avoid damaging the five plastic light pipes that extend through the front panel.

### Installing the Rack Front Panel



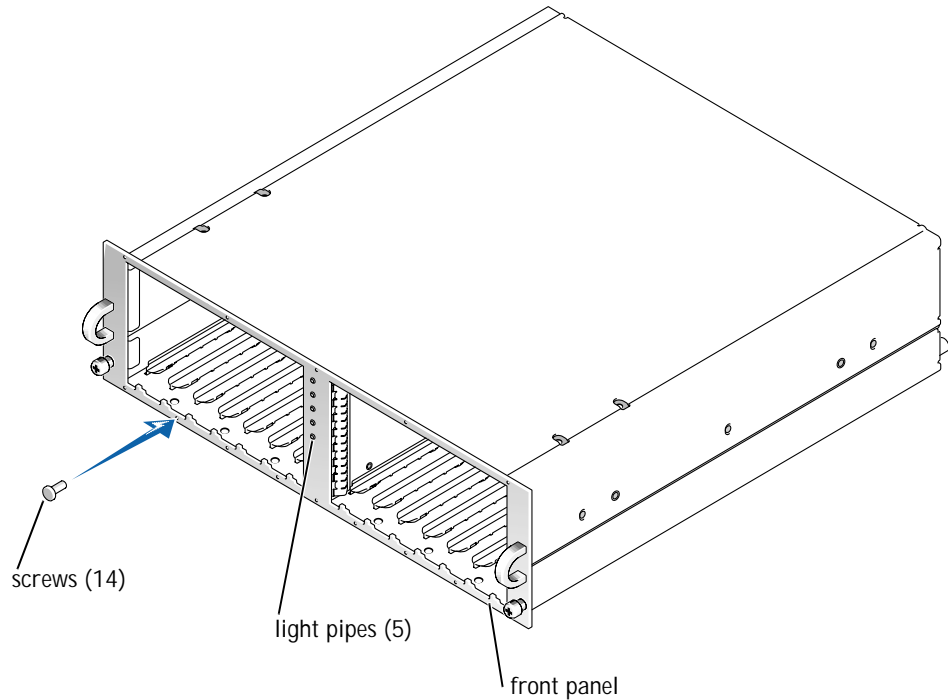
- 1 Position the rack front panel on the front of the system chassis, using care to install the five light pipes in their holes in the front panel.  
 **NOTE:** In the next step, start all 14 T-10 Torx screws in their holes before tightening any of the screws to ensure proper alignment.
- 2 Secure the rack front panel to the chassis with the 14 T-10 Torx screws that you removed in step 6 of the last procedure, “Removing the Bezel, Drives, Covers, and Front Panel” (see Figure 1-9).
- 3 Reinstall the power and cooling modules (if they were removed).  
 **NOTE:** Do not install the hard drives until the next procedure, “Installing the System in the Rack,” is completed.

Figure 1-9. Installing the Rack Front Panel



## Installing the System in the Rack

**⚠ CAUTION:** If you are installing more than one system, install the heaviest system in the lowest available position in the rack.

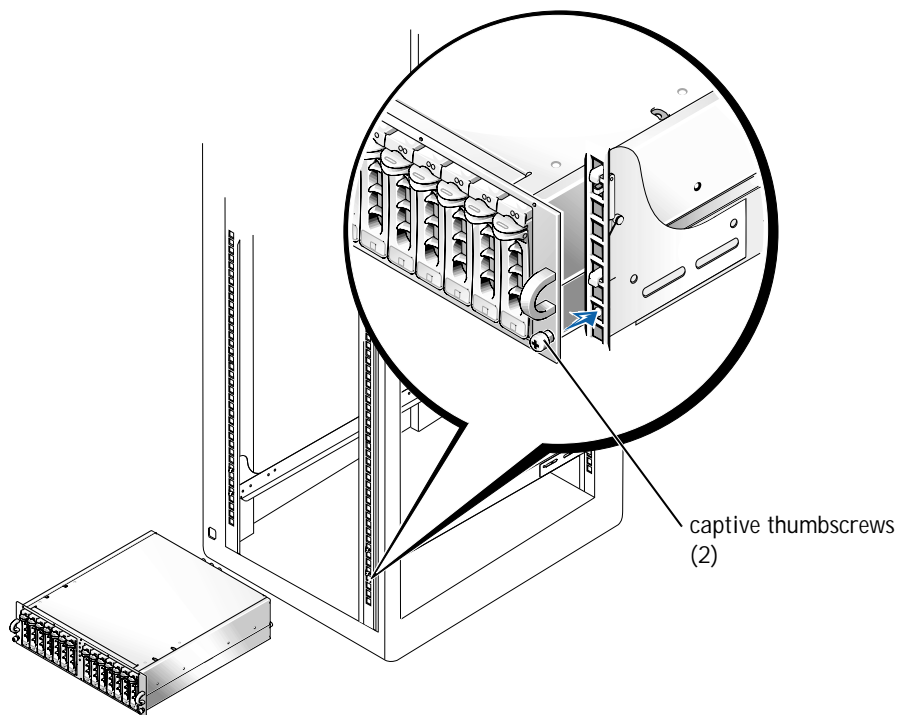
**⚠ CAUTION:** *Never* pull more than one component out of the rack at a time.

- 1 Lift the system into position in front of the mounting rails you installed in the rack cabinet.

**⚠ CAUTION:** Because of the size and weight of the system, never attempt to install the system in the rails by yourself.

- 2 Slide the system into the rack until the system front panel is against the vertical rails (see Figure 1-10).
- 3 Tighten the captive thumbscrews on each side of the system's front panel.

Figure 1-10. Installing the System in the Rack



## Replacing the Rack Doors

See the procedures for replacing doors in the documentation provided with your Dell 24-U and 42-U rack cabinets. If you have a Dell PowerEdge 4210 rack cabinet, see the procedures in the *Dell PowerEdge 4210 Rack Installation Guide*. If you have a rack cabinet not manufactured by Dell, see the manufacturer's documentation for replacing doors.

This completes the rack installation of your system.

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