EQUALLOGIC

PS6500 Storage Arrays

Rack Mount Instructions

Part Number: R724M Rev. A01

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Introduction

For proper operation, a PS6500 storage array must be installed in a rack. A PS6500 array uses a telescopic rail system that enables you to pull the chassis away from the rack, opening the chassis cover and exposing the disks drive slots.

See your PS Series support provider for information about supported racks.

Before You Begin

Before you begin to mount an array in a rack, you must:

- Read the installation safety precautions. See *Installation Safety Precautions*.
- Make sure the rack location meets the array's environmental requirements. See *Installation Environmental Requirements*.
- Make sure your rack meets the rack requirements. See *Rack Requirements*.
- Unpack the rail kit and make sure you have all the necessary parts and tools. The rail kit is located in the array shipping box. You must supply your own tools. See *Rail Kit Parts* and *Tool Requirements*.

Installation Safety Precautions

Follow these safety requirements:

- It is recommended that only individuals with rack mounting experience install a PS6500 array in a rack.
- Make sure the array is fully grounded at all times to prevent damage from electrostatic discharge.
- When handling the array hardware, you must use the electrostatic wrist guard shipped with the array or a similar form of protection.
- You need at least two people to lift the array chassis from the shipping box. (Lifting straps are included in the shipping box.) If possible, use a mechanical box lifter to move the chassis.

Installation Environmental Requirements

The rack location must meet the following environmental requirements:

- Only operate an enclosure from a power source with a voltage range of 100 to 240 VAC.
- Make sure your power source has sufficient electrical overload protection.
- In North America, connect the enclosure to a source of power with over-current protection provided by a double pole 20A or less device (UL 489 circuit breaker). In Europe, the over-current protection must be provided by a 20A or less device (IEC circuit breakers).
- Make sure there is sufficient space for air flow in front of and behind the array, and room in front of the rack to fully open the array and access the channel cards, EIP card, and all the drive slots.
- Make sure the location is properly vented.
- Make sure the rack installation meets the array technical specifications in Table 1.

Table 1: PS6500 Array Specifications

Specification	Value
Weight without disk drives	35 kg (77 lb)
Weight with disk drives	80 kg (177 lb)
Operating temperature	5 to 35 °C (41 to 95 °F)
Storage temperature	1 to 60 °C (34 to 140 °F)
Maximum operating altitude	0 to 3048 meters (0 to 10,000 feet)
Operational relative humidity	20% to 80% noncondensing
Storage relative humidity	5% to 80% noncondensing
Thermal output (fully-loaded array)	3400 BTU/hour
Operational shock	5*g* peak ½ sin for 10 ms
Operational vibration	.21 G_{rms} 5 to 500 Hz Random
Input voltage	100 to 240 VAC (auto-sensing)
Input frequency	50 – 60 Hz
System input power	1400 VA (maximum)
Each power supply	440 watts DC output Maximum input power: 0.7 KVA Input current: 7 – 3.5A
Chassis dimensions	17.5 cm by 48.3 cm by 81.0 cm (6.89 in. by 19.01 in. by 31.90 in.)

Rack Requirements

The rack must meet the following requirements:

- Use an industry-standard (for example, CEA-310-E), four-post, 19 inch (48.3 cm) rack.
- The rack must be rated for 540 kg (1200 pounds) static load or greater.
- The minimum rack depth is 101.6 cm (40 inches) from the front of the rack to the rear of the rack.
- The distance between the outside of the front and rear rack posts (the mounting surfaces) must be 58.2cm to 79.4cm for square hole racks; 57.5cm to 78.6cm for round hole (unthreaded) racks; or 60.5cm to 81.7cm for threaded hole racks.
- Secure the rack to the floor for added stability.
- Load a rack with arrays from the bottom to the top.
- Install a maximum of six arrays in a rack, for ease of access to the disk drives. In a PS6500, drives are inserted from the top.
- There must be at least 1 inch (2.54 cm) between the rack door and the front of the array to accommodate the array front bezel.
- There must be at least 2 inches (5.1 cm) between the rear of the array and the rear of the rack to accommodate the cable management system.
- The rack (with installed arrays) must meet the safety requirements of UL 60950-1 and IEC 60950-1.

- Mount the array in a horizontal position, or you will void your array warranty and support contract.

Rail Kit Parts

The rail kit includes the parts described in Table 2.

Table 2: Rail Kit Parts (Images Not to Scale)

Item	Graphic	Quantity	Description
1		2	Left and right side mounting rails. Each mounting rail includes a telescopic rail assembly.
2		2	#10-32 countersunk screws Used to attach the chassis cover to the front rail flanges.
3		12	#10-32 pan head screw Used to attach the rails to tapped-hole rack posts.

Tool Requirements

You need the following tools to mount an array in a rack. These tools are not provided in the array shipping box.

- #2 Phillips® screwdriver to secure the top cover to the front rail flanges
- Torx® T15 driver to configure the rails tor threaded hole rack installation (if applicable)
- Flathead screwdriver to open and close the cam locks

Steps for Mounting an Array in a Rack

Follow these steps to mount a PS6500 array in a rack:

1. Determine where to place the mounting rails in the rack.
2. Remove the bezel.
3. Remove the power supply and cooling modules.
4. Attach the mounting rails to the rack. For tapped hole racks, additional steps apply.

5. Slide the chassis into the rack.
6. Attach the chassis cover to the front rail flanges.
7. Install the disk drives.
8. Install the bezel.
9. Install the power supply and cooling modules.
10. Install the cable management system.

These steps are described in detail in the following sections. After you rack mount the array, see the *Installation and Setup* manual for information about completing the array hardware installation.

Step 1: Determine Where to Place the Mounting Rails in the Rack

Make sure there is enough space in the rack for a 4U chassis. In a standard rack, the height of a 4U chassis will span 12 post holes.

Step 2: Remove the Bezel

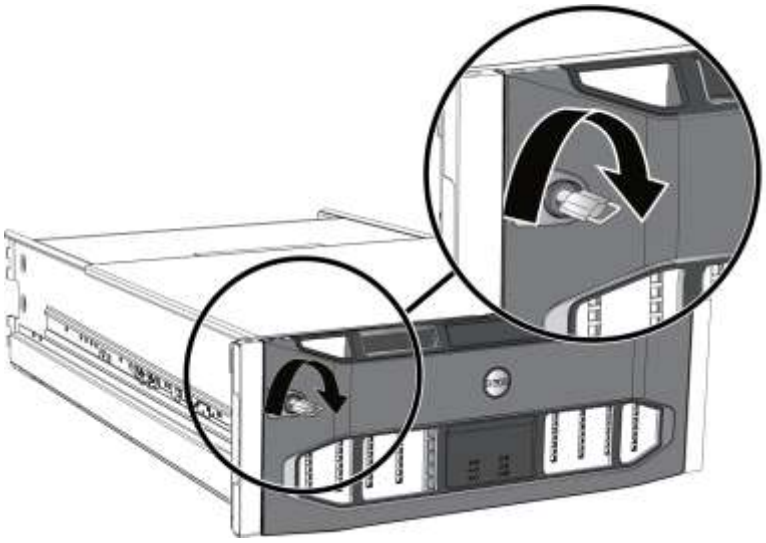
You must remove the bezel before mounting the array in a rack.

1. Remove the array from the shipping box and place it on a sturdy surface that can hold the weight of the chassis without disk drives (35 kg or 77 lb).

   The array is *heavy*. Use the lifting straps included in the shipping box *only* to remove the array from the box. At least two people are needed to lift the chassis. If possible, use a mechanical box lifter to move the array.

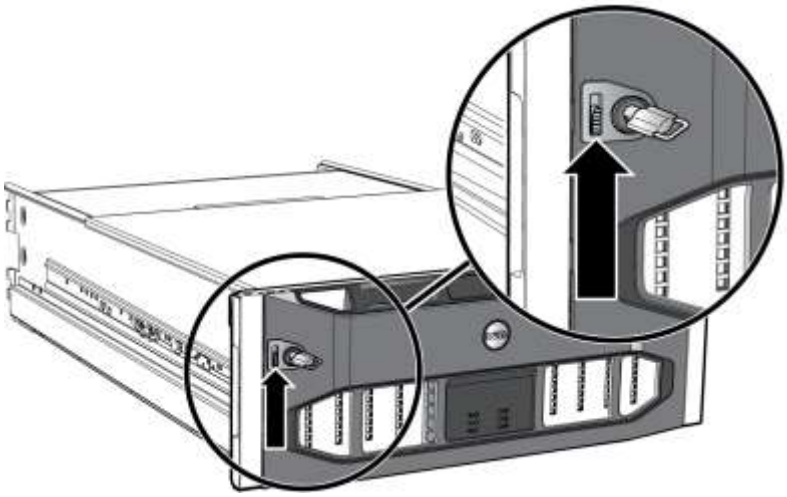
2. Insert the bezel key and turn it clockwise to unlock the bezel. The key is attached to the bezel.

Figure 1 Unlocking the Bezel



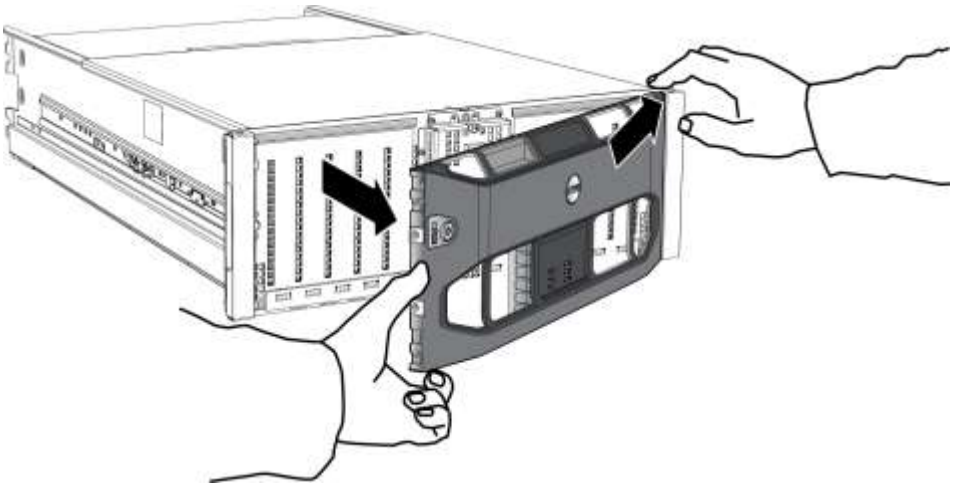
3. While holding the bezel on the right side, release the bezel latch by pushing the latch up. See Figure 2.

Figure 2 Releasing the Bezel Latch



4. Pull the bezel away from the chassis. See Figure 3.

Figure 3 Detaching the Bezel from the Chassis

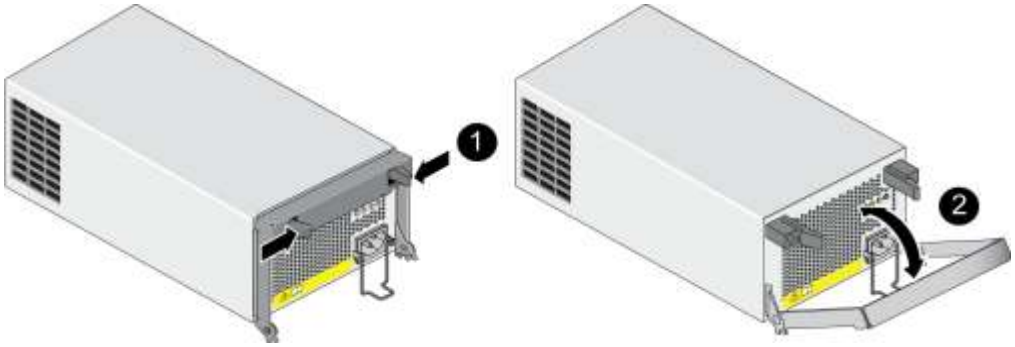


Step 3: Remove the Power Supply and Cooling Modules

Remove the three power supply and cooling modules to make the array lighter and easier to install in the rack.

1. Facing the rear of the chassis, squeeze together the module latches, release the handle, and rotate the handle downwards. See Figure 4 (shows power supply module by itself for clarity).

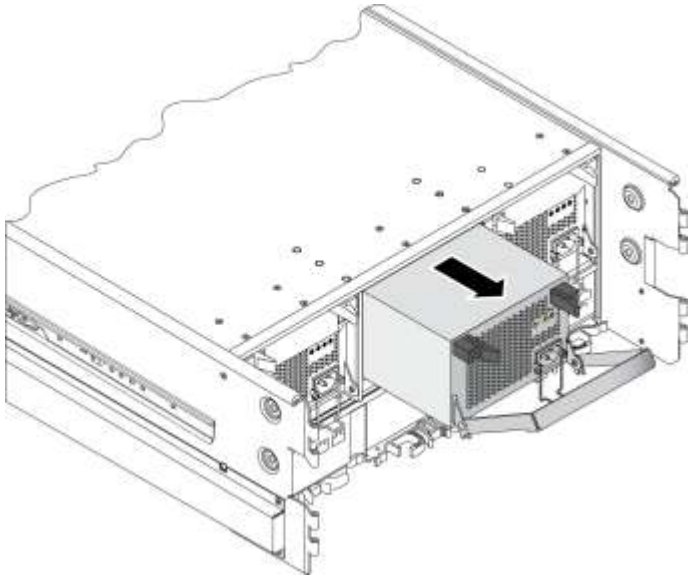
Figure 4 Removing a Power Supply and Cooling Module



2. Carefully slide the module from the slot and place the module on a sturdy surface that is protected from electrostatic discharge. See Figure 5.

   Note: Remove one module at a time. Do not stack the modules.

Figure 5 Removing a Power Supply and Cooling Module



Step 4: Attach the Mounting Rails to the Rack Posts

The rail kit includes two mounting rails, one for the left rack post and one for the right rack post when viewed from the *front* of the rack. Each mounting rail includes a telescopic rail assembly.

Note: If your rack has side panels, it might be helpful to remove them for ease of access.

Guidelines for Attaching the Mounting Rails

Follow these guidelines when attaching the mounting rails to the rack posts:

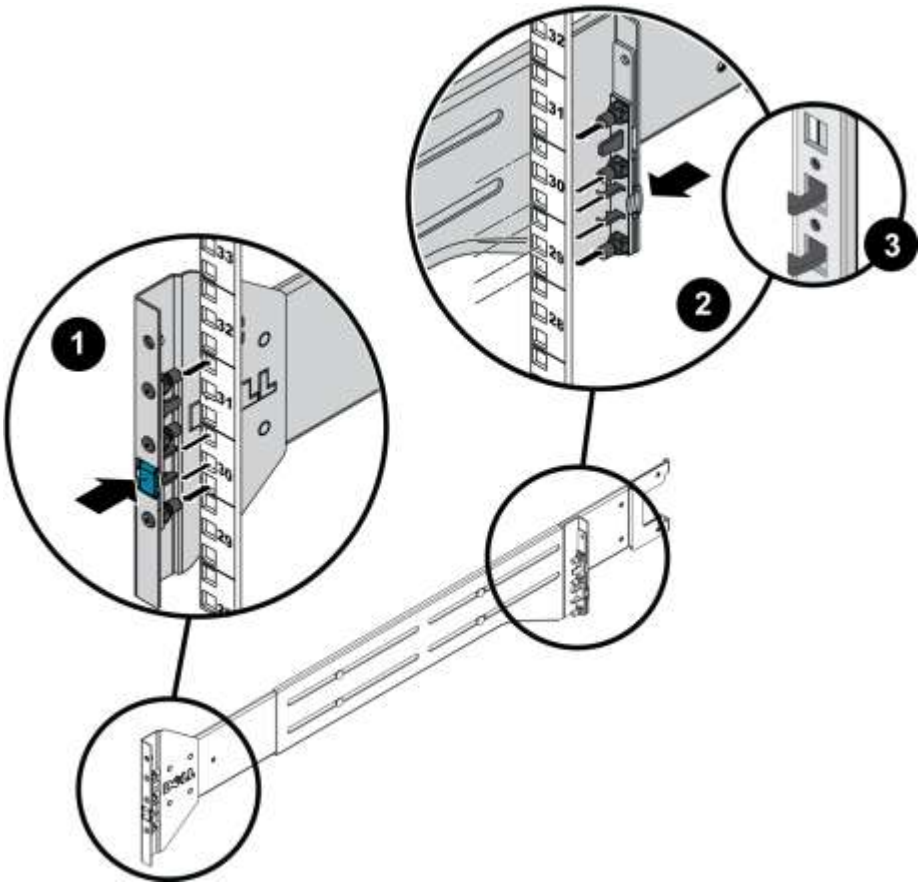
- Attach the mounting rail flanges to the outside of the rack post flanges.
- For tapped hole racks, insert the screws from the outside of the rack.
- Use the markings on the rack posts to make sure the rails are level.

Attaching the Rails to Square-Hole or Round-Hole (Unthreaded) Posts

1. Position the left and right rail end pieces labeled FRONT facing inward and orient each front end to align with the 4U space where you will install it.
2. Align the back end so that the bottom peg is aligned with the bottom hole of the first U. See Figure 6.
3. Engage the back end of the rail until it fully seats on the vertical rack flange and the second tooth (on square-hole racks) or the first tooth (on round-hole racks) on the latch locks in place.
4. Repeat these steps to position and seat the front end piece on the vertical flange.

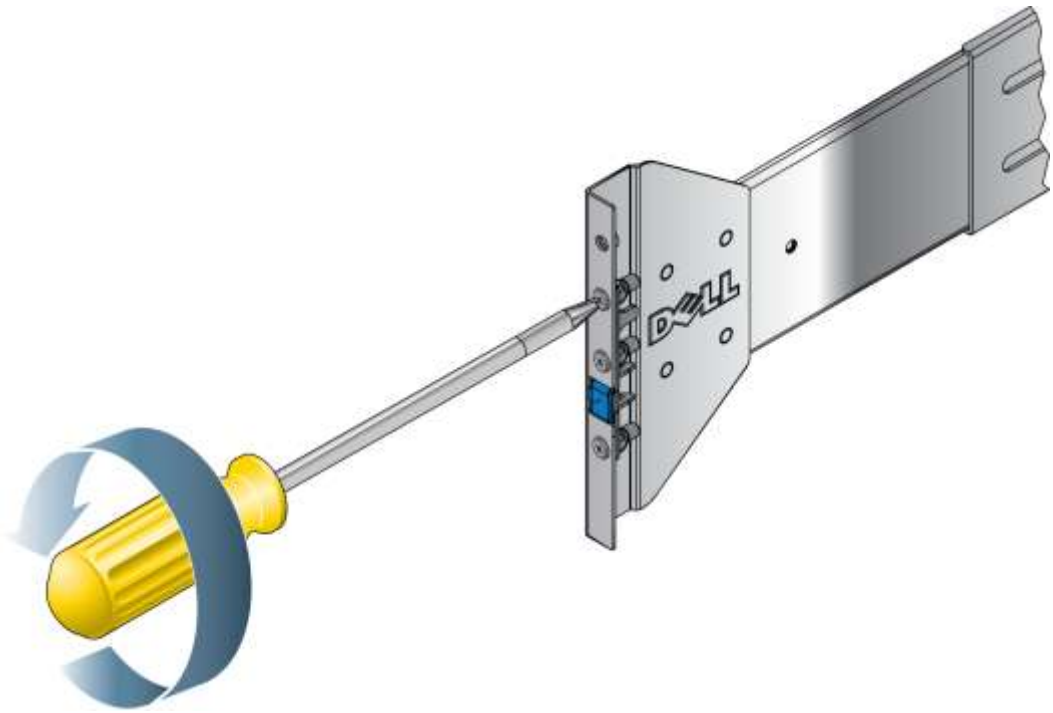
   Note: When correctly installed, the front rail pegs will be one U higher than the rear pegs. For example, if the front pegs are in U 30 and 31, the rear pegs will be in U 29 and 30.
5. To remove the rails, pull on the latch release button on the middle of each end piece and unseat each rail.

Figure 6 Attaching the Rails to the Rack (Square Hole Rack Shown)

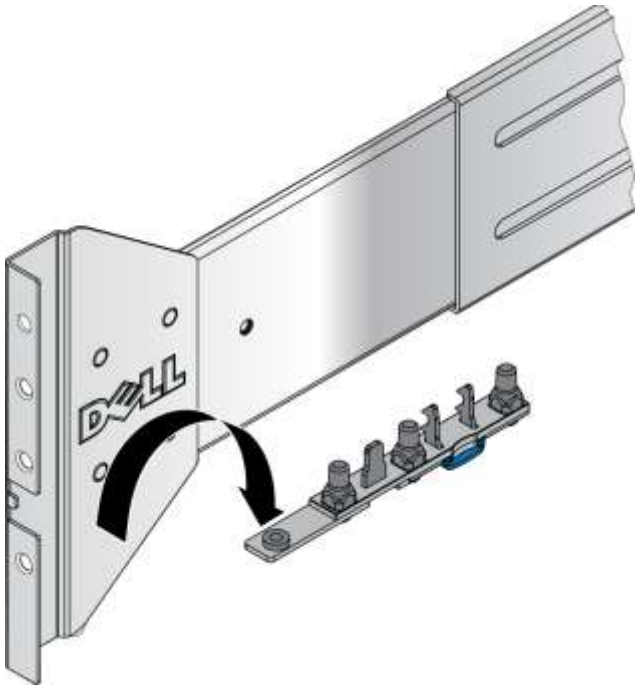


Attaching the Rails to Tapped (Threaded) Hole Posts

1. On each rail, use a Torx driver to remove the six screws holding the front and rear peg and latch assemblies to the rail.



2. Discard the peg and latch assemblies and the screws.

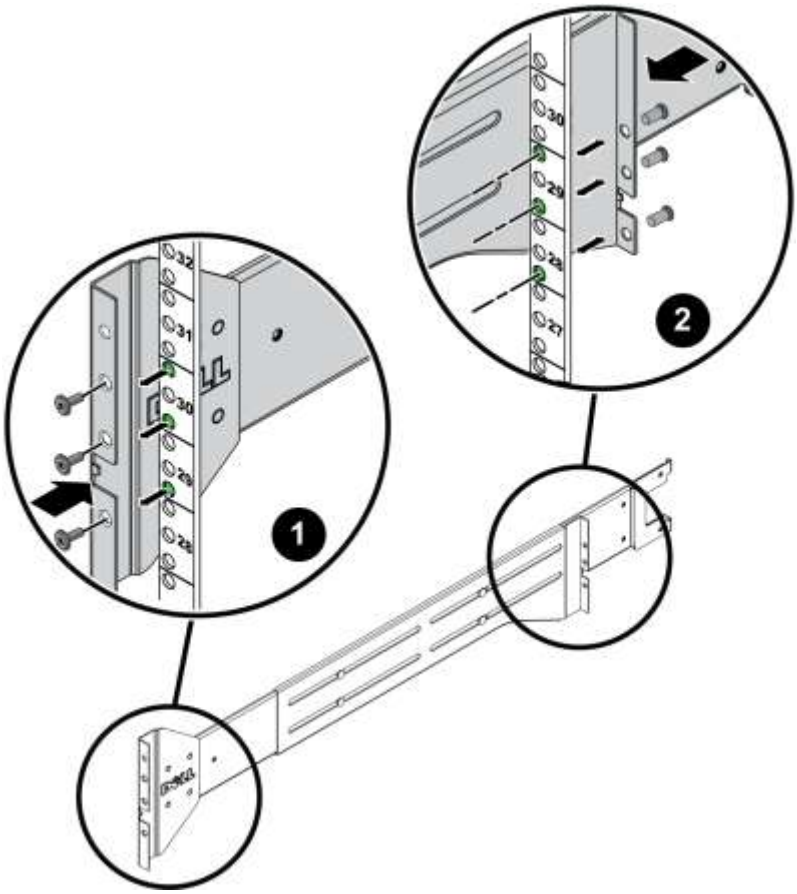


Orient the mounting rails in their proper position. Refer to Figure 7.

3. Secure each mounting rail to the front and rear rack posts using the supplied 10-32 screws (if applicable) and a #2 Phillips driver, or the correct size and thread screws for your rack (not supplied).

   N**ote:** When correctly installed, the front screws will be one U higher than the rear screws. For example, if the front screws are in U 29 and 30, the rear screws will be in U 28 and 29.

Figure 7 Attaching a Mounting Rail to Tapped-Hole Posts

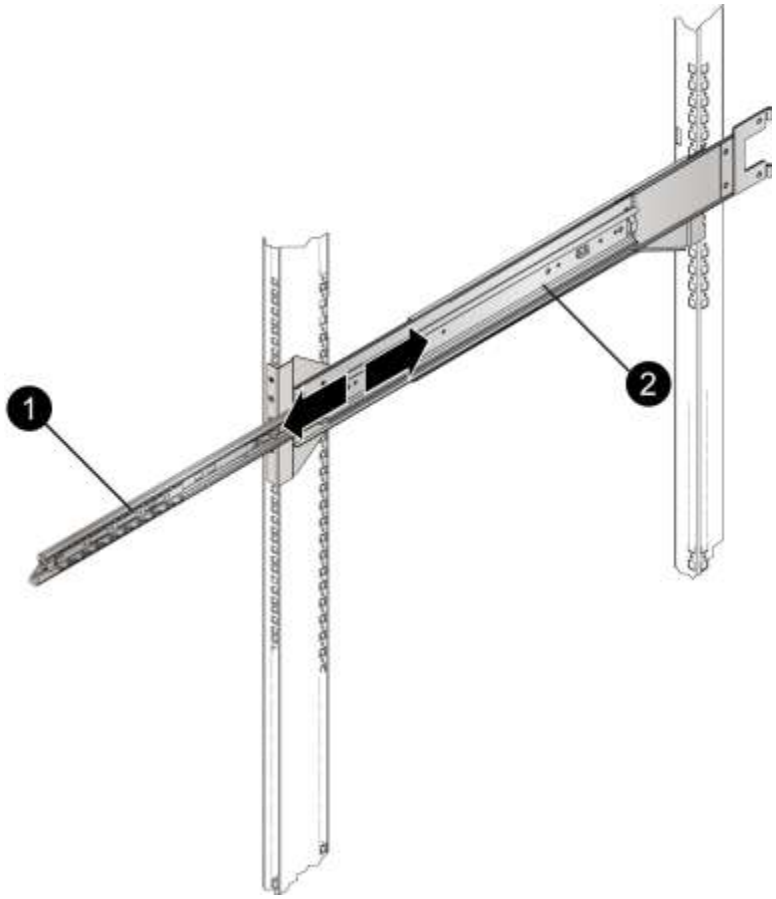


Step 5: Slide the Chassis into the Rack

Be careful when lifting the chassis. If available, use a mechanical box lifter to move the chassis into position. Otherwise, use two people to lift and position the chassis.

1. On both rail arms, pull the telescoping sections out to the end of their travel and make sure they click into place.

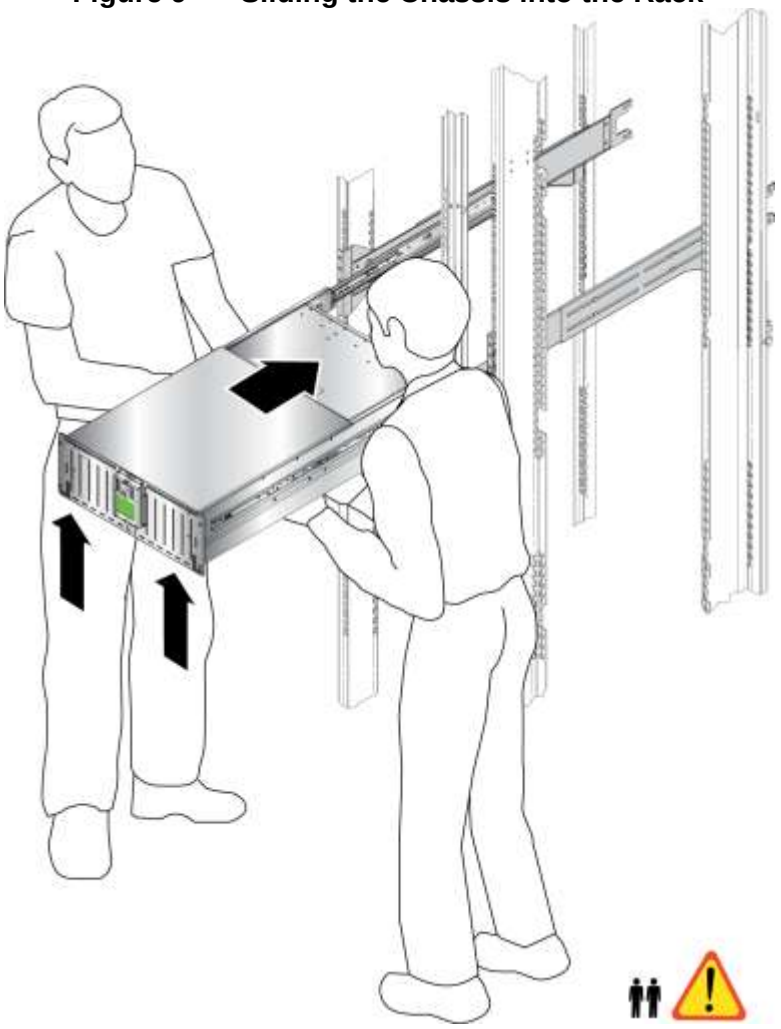
Figure 8 Fully Extend the Telescoping Sections



2. With assistance, lift the chassis as described below, and slide the enclosure rails into the mounting rails. See Figure 9.

   - Use a box lifter (preferred) or two people, one on each side, to raise the chassis to the height of the mounting rails.
   - Move the chassis as close to the rack as possible.
   - Keep the chassis level as you engage the enclosure rails and the mounting rails. You may have to gently press the mounting rails closer to the chassis to line up and engage the enclosure rails.
   - Do not force the rails to engage or you may damage the ball bearing race. If you meet resistance, the chassis may not be level.

Figure 9 Sliding the Chassis into the Rack



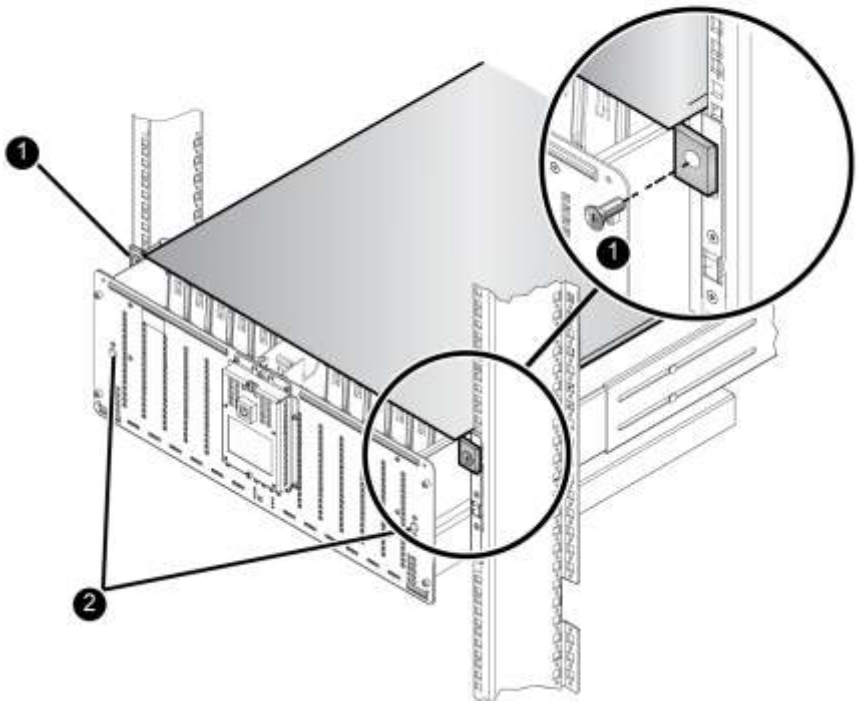
3. Continue to slide the array chassis fully into the rack until you hear it snap into place.

Step 6: Attach the Chassis Cover to the Rail Flanges

Attaching the chassis cover to the front rail flanges enables you to pull out the array like a drawer, providing access to the disk drive slots.

1. Unlock the chassis by using the flathead screwdriver to turn both cam screws (callout 2 in Figure 10) on the front panel counter-clockwise.
2. Hold the handles on the right side and the left side of the chassis front panel and pull out the front panel approximately 30 cm (12 inches) from the rack. This will expose the disk drive slots and provide room for you to attach the cover to the front rail flanges.
3. Attach the chassis cover to the front left flange and the front right flange (callout 1 in Figure 10).

Figure 10 Attaching the Chassis Cover to the Rack



4. Lock the chassis using the flathead screwdriver to turn both cam screws (callout 2 in Figure 10) on the front panel as follows:

   a. Rotate the cam screws towards the open position (counter-clockwise) as far as they will go.

   b. Push the front of array in to make sure it is fully in contact with the rail flanges.

   c. While holding the array in place, rotate the cam screws towards the closed position (clockwise) until they firmly latch.

Step 7: Install the Disk Drives

Handle the disk drives as follows:

- Hold a disk drive only by the plastic carrier. Do not pick it up by the release lever.
- Do not drop or jolt a disk drive.
- Let disk drives warm to room temperature before installation. For example, let a disk drive sit overnight before installing it in an array.
- Insert disk drives in the correct position, with the latch toward the rear of the array. Do not force a disk drive into a slot.

Follow these steps to install a disk drive:

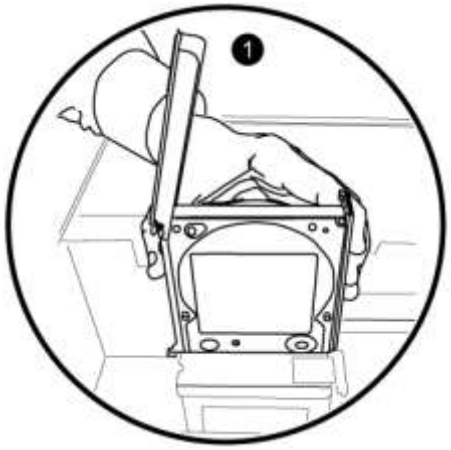
1. Unlock the chassis cover by using a flathead screwdriver to turn both cam screws on the front panel counter-clockwise.

2. Open the chassis cover by holding the handles on the right side and the left side of the chassis front panel and pulling out the front panel.

3. Open the disk release lever on the replacement disk by sliding the latch in the direction of the arrow on the disk drive and pulling up the latch. See Figure 11.

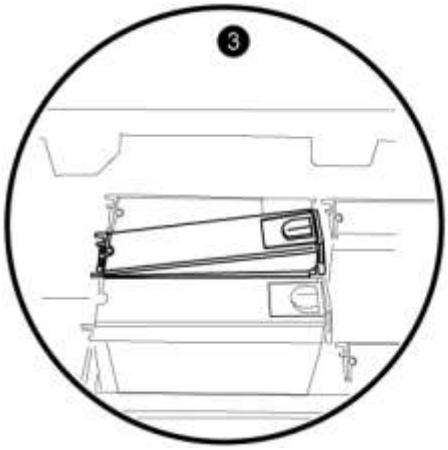
Figure 11 Opening the Disk Release Latch

4. Hold the disk drive by the plastic carrier and position the disk drive so that the latch is toward the rear of the array (where the power supplies and control modules are). Start to insert the drive (1).



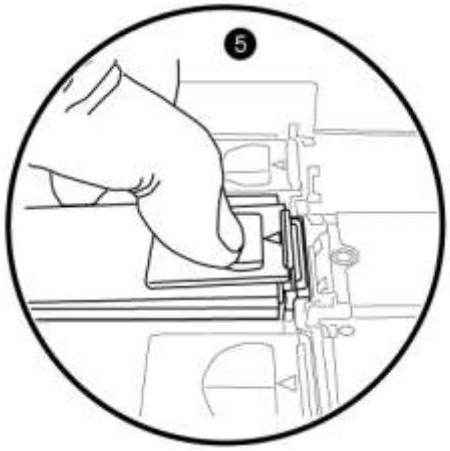
5. Slide the replacement disk drive gently into the slot until you feel resistance (2).

6. Push the disk drive the rest of the way into place. The lever should still be open. Do not force the lever closed (3).

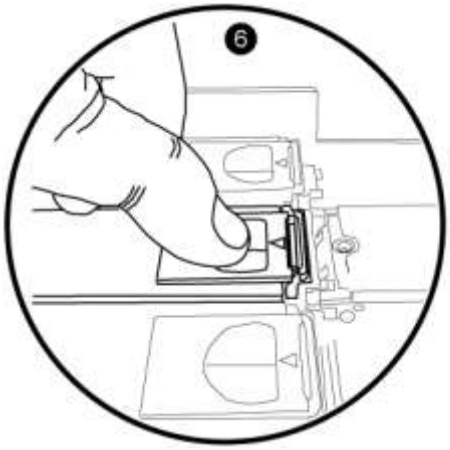


7. Pull back the latch (4).

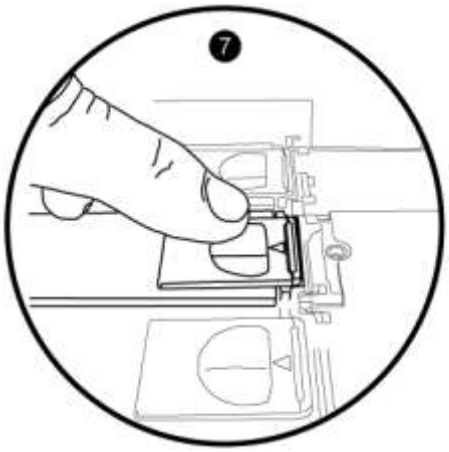
8. Holding the latch open, lower the lever until the drive is fully seated and flush with the other drives (5). Keep holding the latch open.



9. Push the latch forward and make sure it engages with the slot in the drive carrier (6).



10. Let the latch slide forward and make sure it is firmly closed (7).



When correctly installed, the disk drive carrier should not protrude from the top of the chassis. If it does, remove and then reseat the drive.

After you install the last disk drive, close the chassis and lock the cover by using a flathead screwdriver to turn both cam screws on the front panel counter-clockwise.

Step 8: Install the Bezel

To install the bezel:

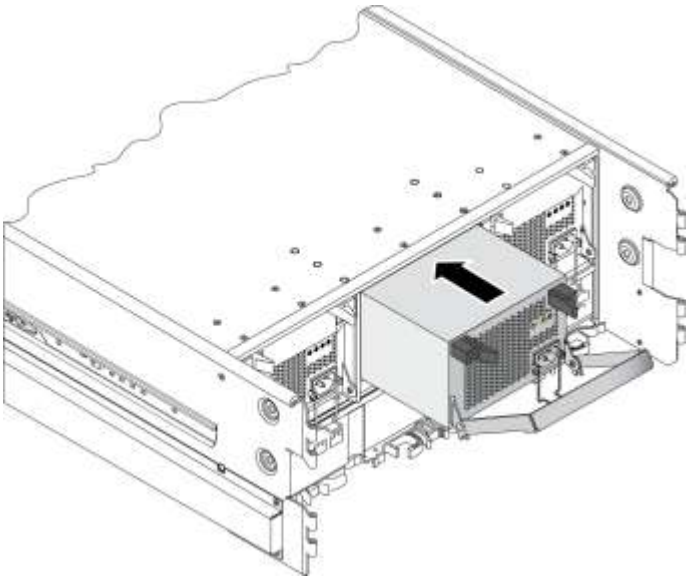
1. Facing the front of the rack, fit the right side of the bezel into the right side of the chassis.
2. Push the bezel toward the chassis until the left side of the bezel engages with the chassis.
3. Insert the bezel key and turn it counter-clockwise to lock the bezel to the chassis. Make sure you store the key in a safe location.

Step 9: Install the Power Supply and Cooling Modules

Once the array chassis is rack mounted, you can install the three power supply and cooling modules.

1. Orient each module so that the power socket is toward the bottom.
2. Carefully slide each module partially into the slot. See Figure 12.

Figure 12 Installing a Power Supply and Cooling Module



3. Push the module completely into the slot, simultaneously rotating the handle upwards to close it and seat the module. Make sure you hear the handle "click" into the latches.

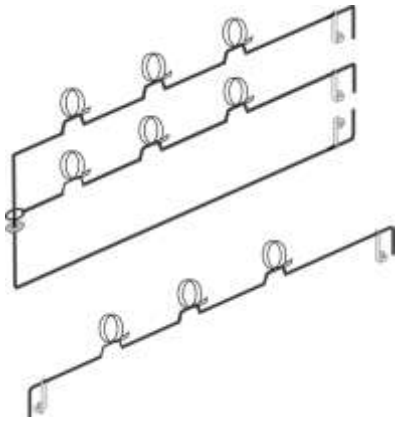
Step 10: Install the Cable Management System

The cable management system attaches to the rear of the chassis and the rack rails. It enables you to organize your power and network cables. It also enables you to open the chassis cover without dislodging the cables.

1. Obtain the cable management system from the array shipping box. The cable management system consists of two wire assemblies. See Figure 13.

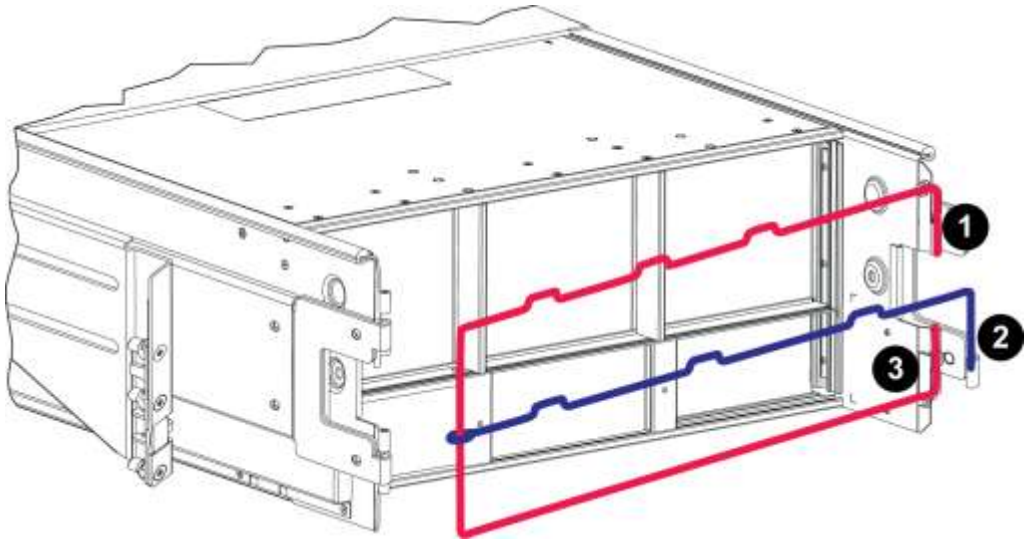
- One wire assembly has three arms, three clamps, and six fabric hook-and-loop fasteners.
- One wire assembly has one arm, two clamps, and three fabric hook-and-loop fasteners.

Figure 13 Cable Management System



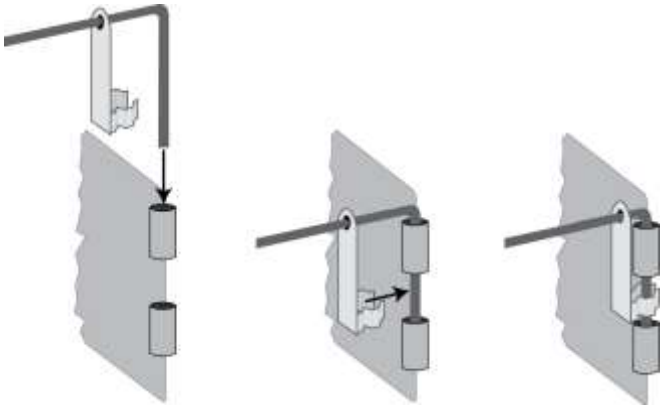
2. Orient the three-arm wire assembly as shown in Figure 14 and attach it to the top and bottom of the rear, right chassis flange (callouts 1, 2, and 3).

Figure 14 Array with Three-Arm Assembly Attached



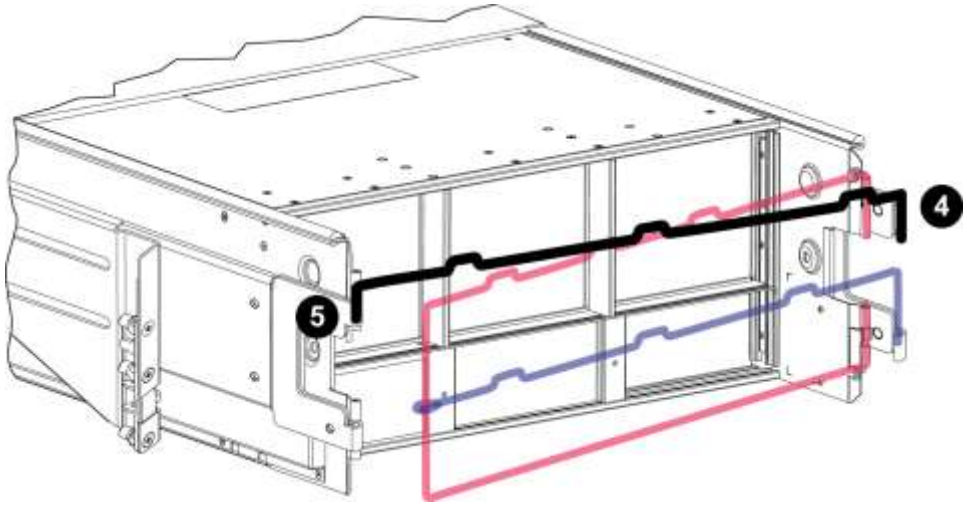
3. Use the attached clamps to secure the arms to the chassis and rails. See Figure 15.

Figure 15 Connecting a Clamp



4. Orient the one-arm wire assembly as shown in Figure 16. Then, attach it to the top of the left and right rails (callouts 4 and 5).

Figure 16 Array with Three-Arm and One-Arm Assemblies Attached



When you connect power and network cables to the array, as described in the PS Series *Installation and Setup* manual, you will route the cables around the arms of the cable management system.

Where to Go Next

See the *Installation and Setup* manual for information about completing the array hardware installation.

Technical Support

Dell's support service is available to answer your questions about PS Series arrays. If you have an Express Service Code, have it ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently.

Contacting Dell

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area.

For customers in the United States, call 800-945-3355.

Note: If you do not have an Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Use the following procedure to contact Dell for sales, technical support, or customer service issues:

1. Visit `support.dell.com` or the Dell support URL specified in information provided with the Dell product.

2. Select your locale. Use the locale menu or click on the link that specifies your country or region.

3. Select the required service. Click the "Contact Us" link, or select the Dell support service from the list of services provided.

4. Choose your preferred method of contacting Dell support, such as e-mail or telephone.

Online Services

You can learn about Dell products and services using the following procedure:

2. Visit `www.dell.com` (or the URL specified in any Dell product information).

2. Use the locale menu or click on the link that specifies your country or region.