

Dell EMC PowerProtect DD9900 System

Installation Guide

Revision 01

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CHAPTER 1

Introduction and Preparation

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Document purpose

This installation guide provides instructions for installing the hardware associated with PowerProtect systems. Systems are shipped to the customer site either pre-installed in a rack (factory-racked) or as separate components to install in an existing rack at the site (field-installed). This guide provides instructions for both types of installation.

This document is intended for customers or Dell EMC Support personnel who are qualified to install PowerProtect systems.

Field-installed systems

To install PowerProtect systems in an existing rack at the customer site, follow all the instructions in this document to rack, cable, and configure the system.

Factory-racked systems

Factory-racked systems are pre-installed in the rack with the cables already connected. Follow the instructions in [Configure System for Use](#) on page 71 to configure factory-racked systems.

The following documents, available from the [Online Support website](#), provide additional information about factory-racked systems:

- *Dell EMC 40U-P Cabinet Site Preparation Guide*
- *Dell EMC 40U-P Cabinet Unpacking and Setup Guide*
- *Dell EMC Titan S Site Preparation Guide*
- *Dell EMC Titan S Unpacking and Setup Guide*
- *Dell EMC Data Domain Rack Service Guide*

DD9900 system features

Table 1 DD9900 system features

Configurations		Single Node	HA A-P
Processor		4 x Intel Xeon Gold, 2294 Mhz, 18C	
Kernel		4.4	
Memory Configurations	Total	1152 GB	
	DIMMs	24 x 16 GB + 24 x 32 GB	
HDD Drive Size		8TB	
Supported Capacity	Active Tier	576 <-> 1248 TBu	
	Cloud Tier	2016 TBu (Cloud Tier)	
Disk Groups	Active Tier	6 <-> 16	
	Over Provisioning	2	
	Cloud Tier (4TB)	5	
SSDs for OS in 2.5" bays in head		4, 1.92TB, 1 WPD	
Stream Count		1885 Wr, 300 Rd	

Table 1 DD9900 system features (continued)

Configurations		Single Node	HA A-P
Cache SSDs	2.5%	10 (External) 3.84 TB	
Cache SSD shelf	FS25	1	
HA Private Interconnect		N/A	(3) 10G Base-T ports (NDC)
16 GB NVRAM		1	
HW Accelerator	100 Quick Assist Technology (QAT) 8970	2	
Internal SAS	PowerEdge Raid Controller (PERC) H330+ 12 Gbps SAS	1	
External SAS	PMC Quad Port 12 Gbps SAS	3	
SAS String Depth (max)	ES30/ES40	6 (7 for Cloud Tier)	
	DS60	3	
Host interface HBAs	2-port 100 GbE-QSFP28	4 maximum	
	2-port QL41000 25 GbE-SFP28	4 maximum	
	4-port QL41164 10 GbE-SFP+	4 maximum	
	4-port QL41164 10GBASE-T	4 maximum	
	4-port QLE2694 16 Gb FC	4 maximum	
Network Daughter Card option	4-port QL41000 10 GbE-SP+ FasLinQ	1	
	4-port QL41164 10GBASE-T	1	

Product serial number tag (PSNT)

The PSNT provides the system serial number that is used as the initial administrator password for DD OS.

The system serial number is included in two places on the system:

- A small tag clipped to the back of the system, on the left side adjacent to PCIe slots 11-13.

Figure 1 Rear tag



- A larger tag recessed into the front of the chassis on the right-hand side

Figure 2 Front tag



There are two labels on each tag:

- The top label is blue and contains the serial number for the system top level assembly (TLA).
- The bottom label is white and contains the serial number required for the initial password.

Figure 3 Serial number for initial password

Required tools and supplies

Ensure that you have the required tools and supplies on hand for the PowerProtect system installation.

You will need:

- Antistatic wrist strap and conductive foam pad
- Screwdrivers:
 - Phillips #1
 - Phillips #2 with a 4- to 6-inch blade and a magnetic tip
 - Phillips #2 with a 12 in. or longer blade and magnetic tip
 - Flat head with a 3/16 in. blade
 - Flat head with a 1/4 in. blade
 - Torque
- Flashlight (free-standing for single-person installations)
- Roll of 5/8 inch Velcro cable tie material (3M Scotchmate SJ-3401 or similar)
- Null modem cable with DB-9 female connector to connect a service laptop to the PowerProtect system.

The following additional tools and supplies might be needed when working with PowerProtect systems:

- Torque screwdriver
- Pliers
 - Needle nose
 - Regular
 - Locking
- 10 mm socket or wrench
- Diagonal wire cutters (for cutting tie wraps)
- exFAT formatted 4 GB or greater USB flash memory drive

- Tie wraps (4 in. and 8 in.)
- Labels
- Pen or marker
- Masking tape


Safety considerations

Always follow safety recommendations to avoid damage to the system or harm to personnel.

CAUTION

- If the system is used in a manner not specified by the manufacturer, the protection provided by the equipment could be impaired.
- The RJ45 ports on the motherboard, PCI cards, or I/O modules are for Ethernet connection only and must not be connected to a telecommunications network.

Review and follow these important safety recommendations:

- For ESD protection, Dell EMC recommends that you wear a suitable antistatic wrist or ankle strap. Observe all conventional ESD precautions when handling plug-in modules and components.
- All plug-in modules and blank plates are part of the fire enclosure system and should not be removed unless a replacement can be added immediately. Do not run the system without all parts in place.
- Provide a suitable power source with electrical overload protection.
- Provide a safe electrical ground connection to each power cord. Check the grounding of the power sources before applying power.
- A DD9900 system must be operated only from a power supply input voltage range of 200–240 VAC and 50–60 Hz.
- DS60 shelves use 200–240 VAC and 50–60 Hz.
- ES40 shelves use 100–240 VAC and 47–63 Hz.
- FS25 shelves use 100–240 VAC and 47–63 Hz.
- The system is intended to operate with all installed power supplies working as designed.
- A faulty power supply module should be replaced within 24 hours.
- Always disconnect the power connections before removing or replacing a power supply module.
- The main way to disconnect power from the system is to unplug the power supply cord.
- The system includes two power supplies. To completely remove system power, you must disconnect both power supplies.
- Always disconnect the power connections before moving the system.
- If you think the unit is damaged in any way, permanently unplug it.
-  **CAUTION** The system components are heavy. To avoid personal injury and/or damage to the equipment, do not attempt to install or remove system components without a mechanical lift and/or help from another person.
 - A DD9900 system weighs up to 110.01 lbs (49.9 kg).
 - DS60 shelves weigh up to 225 lbs (90.7 kg).

- ES40 shelves weigh up to 68 lbs (30.8 kg).
- FS25 shelves weigh up to 44.61 lbs (20.23 kg).

Working with a portable lift

If you are installing the shelf with all field replaceable units (FRUs) removed, you can install the shelf without using a lift. If you need to install the shelf with FRUs onboard, use a portable lift.

Service personnel generally use the portable lift manufactured by Alum-A-Lift. Instructions for this lift are included in the lift kit. http://www.corkc4.isus.emc.com/wiki/index.php/Lift_Tool describes the Lift equipment and the ordering process.

Note: If you are using a portable lift other than the Alum-A-Lift, adapt these instructions as necessary while following all required safety requirements.

Lift requirements

For installations in racks that are 28U (49 inches) or less above the floor, use the lower mast, which is rated for 400 pounds.

For installations in racks that are more than 28U (49 inches) above the floor, use the lower mast configuration and a support table with the "Voyager" conversion kit, which is rated for 225 pounds.

Adjusting the arms for a frontal lift

About this task

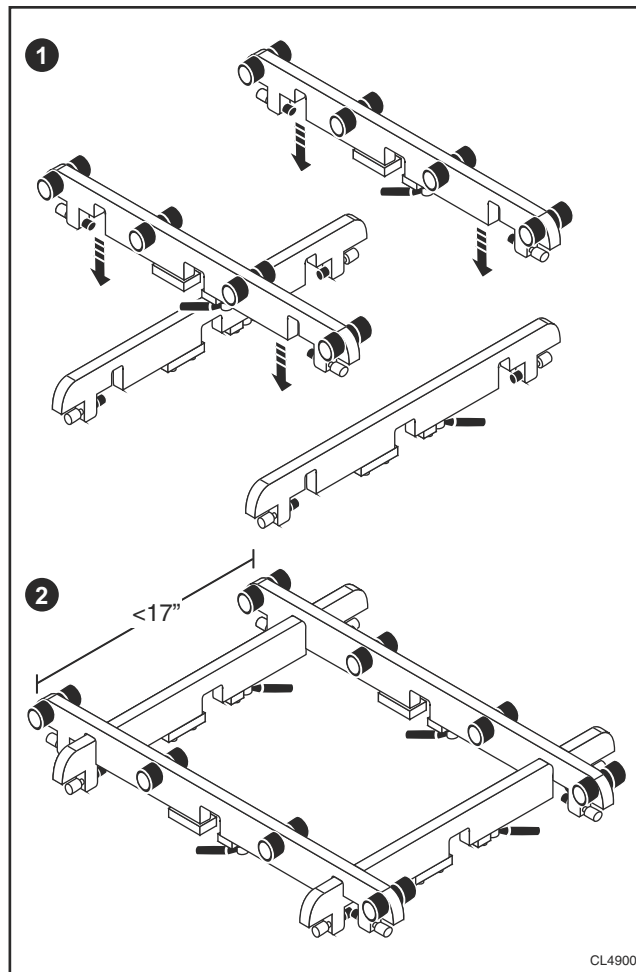
If you plan to use the mechanical lift directly in front of the cabinet, adjust the width of the lift arm/tray to just under 17 inches to ensure that the arms will stay under the chassis.

Procedure

1. Adjust the two arms with rollers so that they are 17 inches apart measured from the outside edges.
2. Tighten the arms to secure them.

The following figure shows an example of adjusting the lift arm/tray to just under 17 inches.

Figure 4 Adjusting the lift arm bar to just under 17 inches



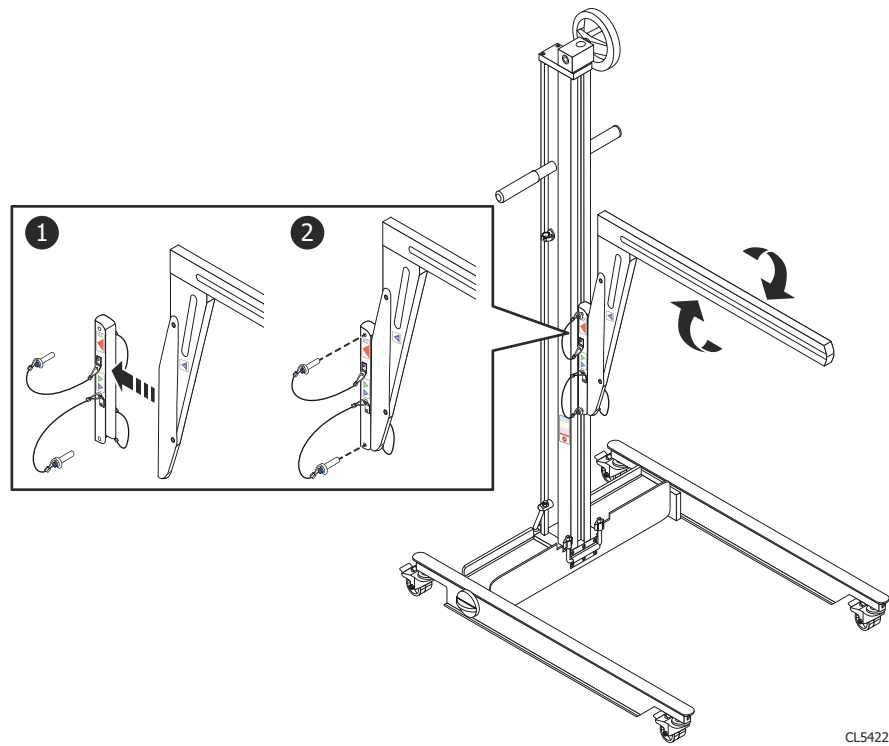
Reconfiguring the lift with the Voyager kit

About this task

If you are using the Alum-A-Lift to install or remove components above 49 inches (28U) from the floor, use the single (lower) mast configuration with the Voyager conversion kit and support table. Refer to the following figure while performing this task.

Procedure

1. Unpack the Voyager kit.
2. Use the instructions provided within the kit to reconfigure the lift.

Figure 5 Reconfiguring the portable lift with the Voyager conversion kit

CHAPTER 2

Install the System in the Rack

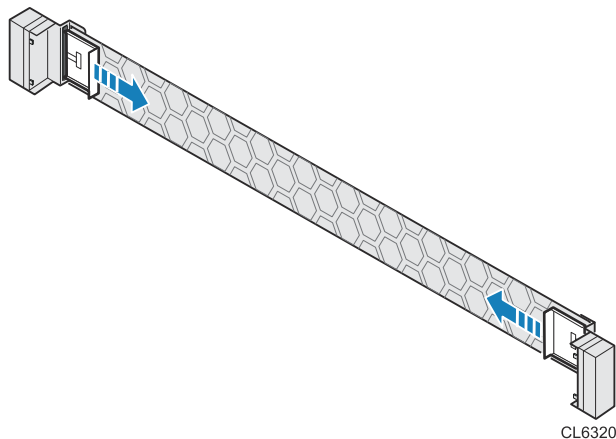
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Remove filler panels

The front space into which you will install the shelf is usually covered by a filler panel. If one or more filler panels cover the space where you want to install the shelf, use this procedure to remove each panel.

Procedure

1. On the filler panel, slide the left and right securing tabs to the open position (towards the center of the panel).



2. Remove the filler panel from the cabinet.

Recommended rack locations for the system

Ensure that you install the system controllers and disk shelves in the appropriate rack locations.

Note: The following recommended rack locations support the cabling described in this document. Installing in other locations might require different cable lengths.

The following table lists the recommended locations for installing the system in the rack.

Table 2 DD9900 system racking locations

Component	Configuration	Rack location
Controller location with ES40 shelves	Single node or high-availability (HA) primary node	U13-U15
	HA standby node	U17-U19
FS25 location with ES40 shelves	Single node and HA	U39-40
ES40 locations	Single node or HA	<ul style="list-style-type: none"> Rack 1 (10 shelves): U01-U12, U21-U38 Rack 2 (10 shelves): U01-U30
Controller location with DS60 shelves	Single node or HA primary node	U12-U14
	HA standby node	U16-18

Table 2 DD9900 system racking locations (continued)

Component	Configuration	Rack location
FS25 location with DS60 shelves	Single node and HA	U39-40
DS60 locations	Single node or HA	U02-U11, U20-U34

Rail kit components

The 3U sliding rail kits secure the server in the cabinet and enable it to be extended from the cabinet to remove the system cover and access the internal field-replaceable units (FRUs).

The rails are compatible with racks with square holes, unthreaded round holes, and threaded round holes.

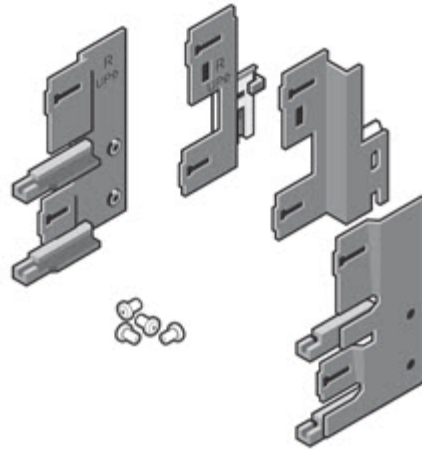
Figure 6 Sliding rail assembly - 3U systems

1. Sliding rail (2)
2. Hook-and-loop strap (2)

The rails are compatible with racks with square holes, unthreaded round holes, and threaded round holes.

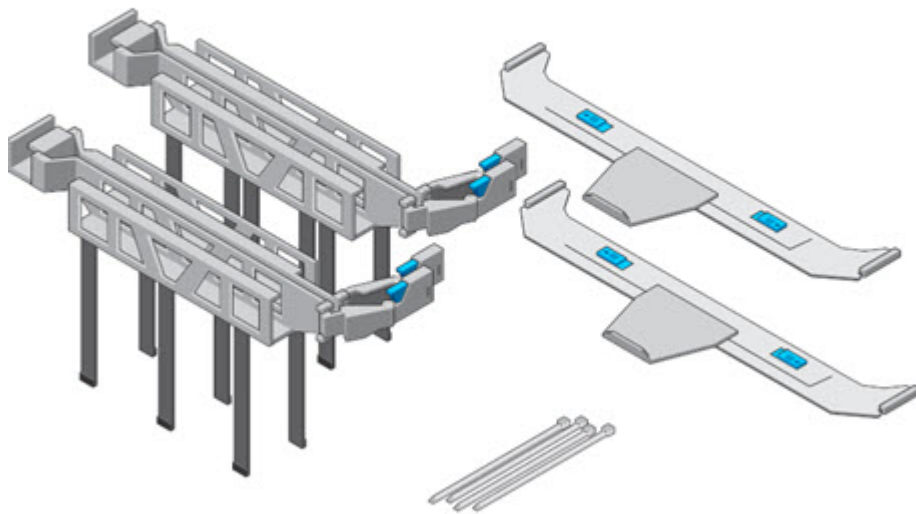
The rail kit also includes a unique cable management (CMA) bracket assembly that consists of inner and outer brackets, and screws to attach the brackets to the rails.

Figure 7 CMA brackets



The CMA assembly consists of two articulated arms, and two separators.

Figure 8 CMA arms and separators



Remove the original CMA brackets

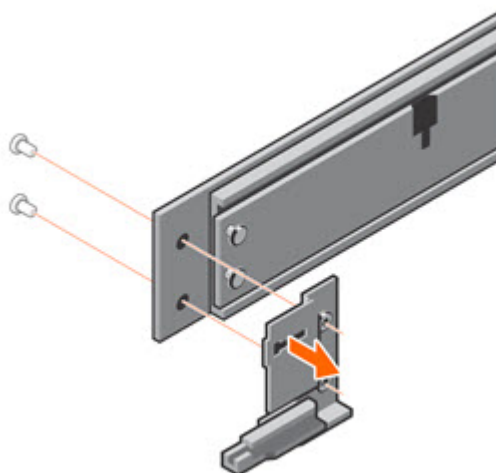
About this task

The system rails may ship with CMA brackets already attached. If the brackets are attached, they must be removed.

Procedure

1. Remove the two screws holding the CMA bracket to the rail.

Figure 9 Remove the original CMA bracket



2. Repeat the previous step for the second rail.

Attach the new CMA brackets

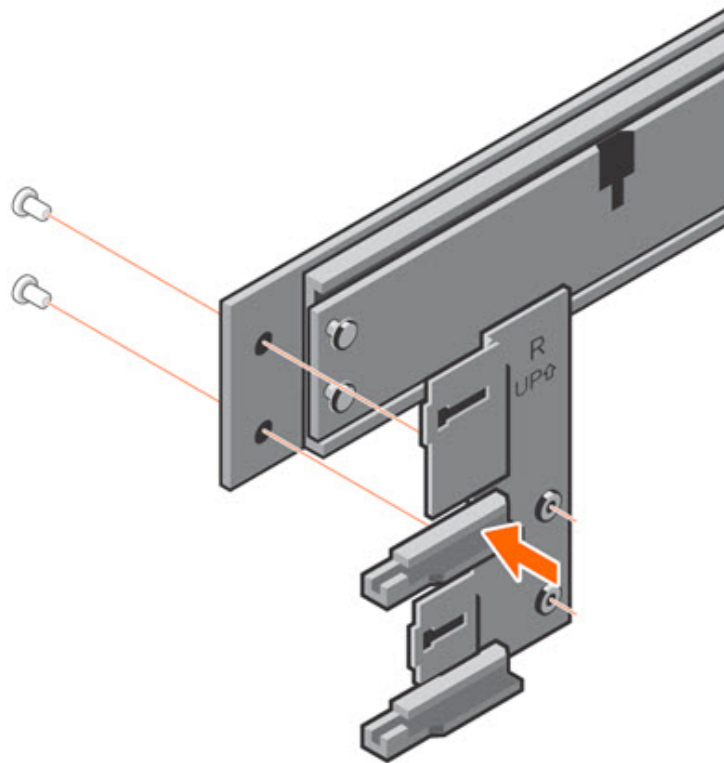
About this task

The brackets are labeled left and right, and cannot be interchanged. The top of each bracket is labeled **Up**.

Procedure

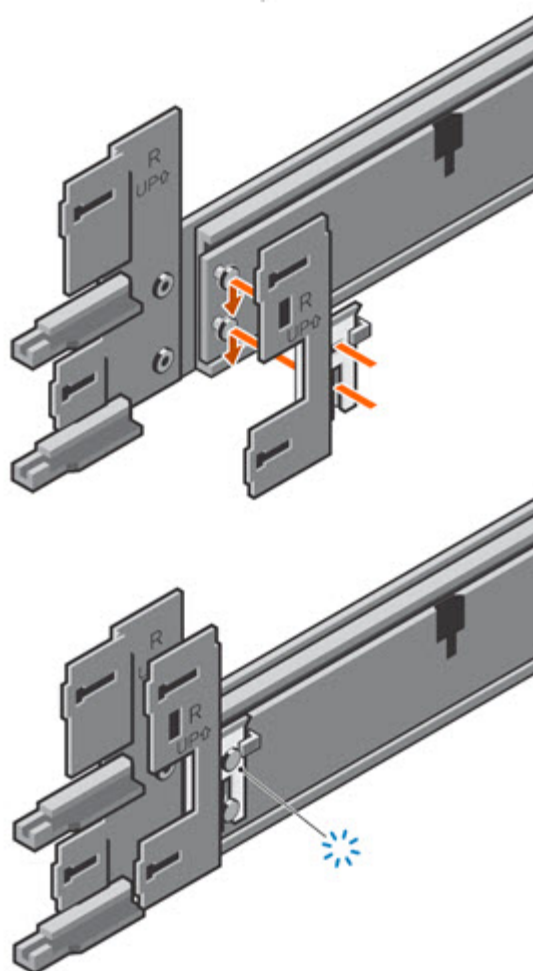
1. Use the included screws to install the outer bracket to the rail.

Figure 10 Attach outer CMA bracket to the rails



2. Align the hole of the inner bracket and push down to attach it to the rail.

Note: Some pressure is required to push the inner bracket down and secure it. The bracket clicks when it locks in place.

Figure 11 Attach inner CMA bracket to the rails

3. Repeat the preceding steps to attach the outer and inner brackets to the other rail.

Install the rails

About this task

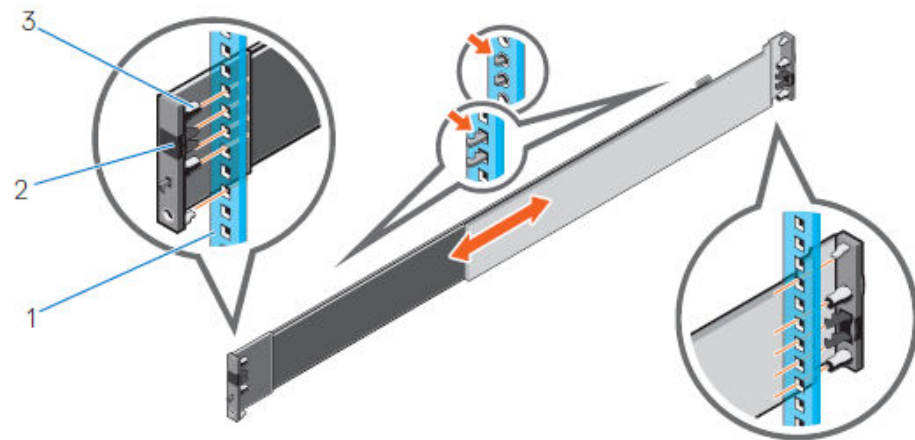
The rails are labeled left and right, and cannot be interchanged. The front side of each rail is labeled **Left Front** or **Right Front**.

Install the left rail first, and then repeat the procedure for the right rail.

Procedure

1. Hold the rail with the rail end pieces labeled **FRONT** facing the front of the rack flanges.
2. Align the back rail end piece until it is seated on the rack flange and the latch clicks into place.
3. Align the front rail end piece until it is seated on the rack flange and the latch clicks into place.

Figure 12 Installing the rails



1. Rack flange
2. Release latch (2)
3. Rail end piece (2)

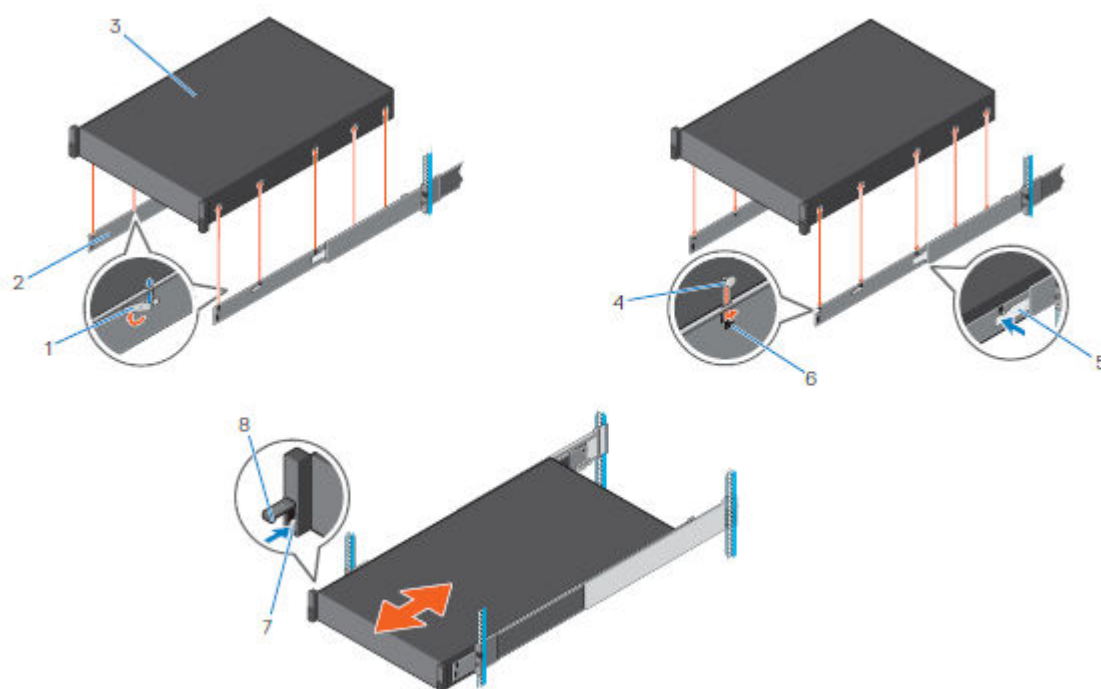
Install the system in the cabinet

About this task

CAUTION The system components are heavy. To avoid personal injury and/or damage to the equipment, do not attempt to install or remove system components without a mechanical lift and/or help from another person.

Procedure

1. At the front of the cabinet, pull the inner slide rails out of the cabinet until they lock into place.
2. Align the rear standoffs on each side of the system with the rear J-slots on the slide rails, and then lower the system until the remaining standoffs are seated in the J-slots.
3. Push the system inward until the server-lock latches click into place.
4. Push the system inward until the lock levers click into place.
5. Press the slide-release lock latch on both rails and slide the system into the rack until the slam latches engage with the rails.

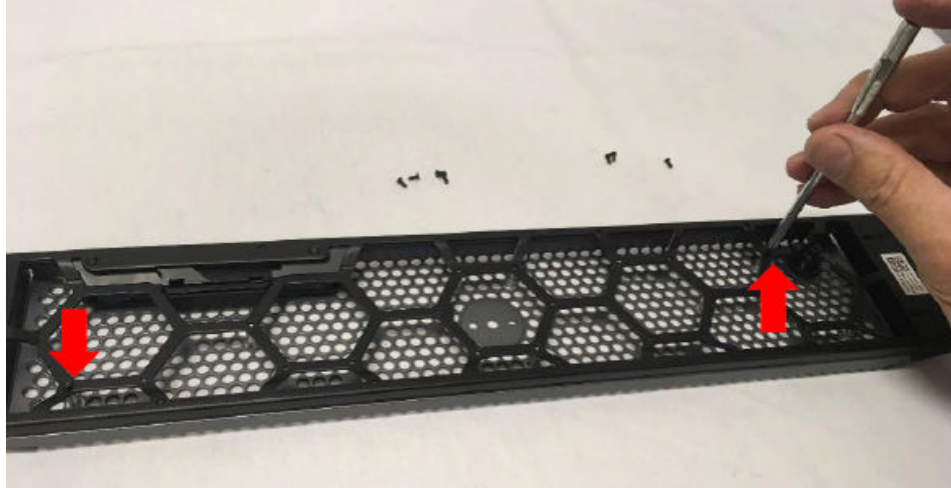
Figure 13 Install the system in the rails

1. Server-lock latch (2)
2. Inner slide rail (2)
3. System
4. Standoff on the system
5. Slide-release lock latch (2)
6. J-slot on the rail
7. Screw (2)
8. Slam latch (2)

Installing a custom OEM bezel faceplate

Procedure

1. Align the custom faceplate with the OEM bezel.
2. Using a Phillips #1 screw driver, secure the opposite ends of the faceplate to the corners of the bezel.
3. Secure the faceplate to the bezel with the remaining screws.



Note: The number of screws required to hold the bezel faceplate might vary depending on the height of the system.

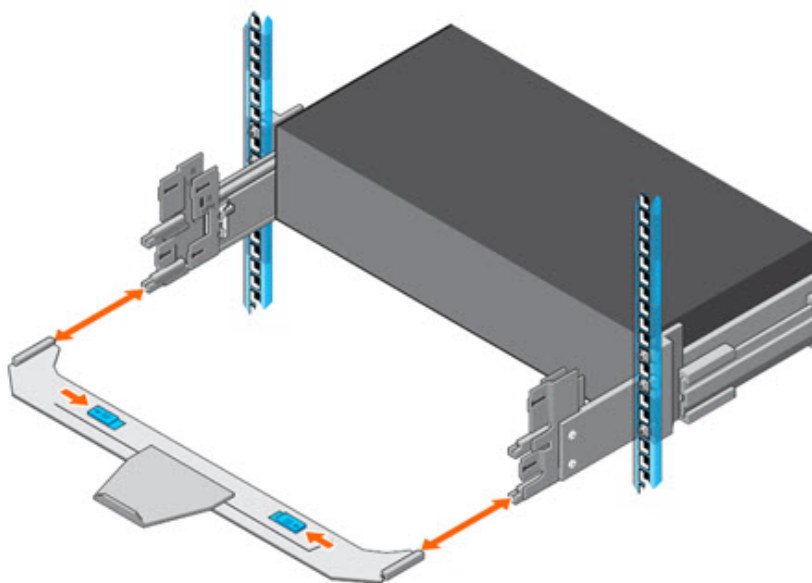
- 1U bezel - 4 screws
- 2U bezel - 9 screws
- 3U bezel - 8 screws
- 4U bezel - 16 screws

4. Install the optional front bezel.
5. Install the standard faceplate into the original bezel before returning.

Install the CMA arms

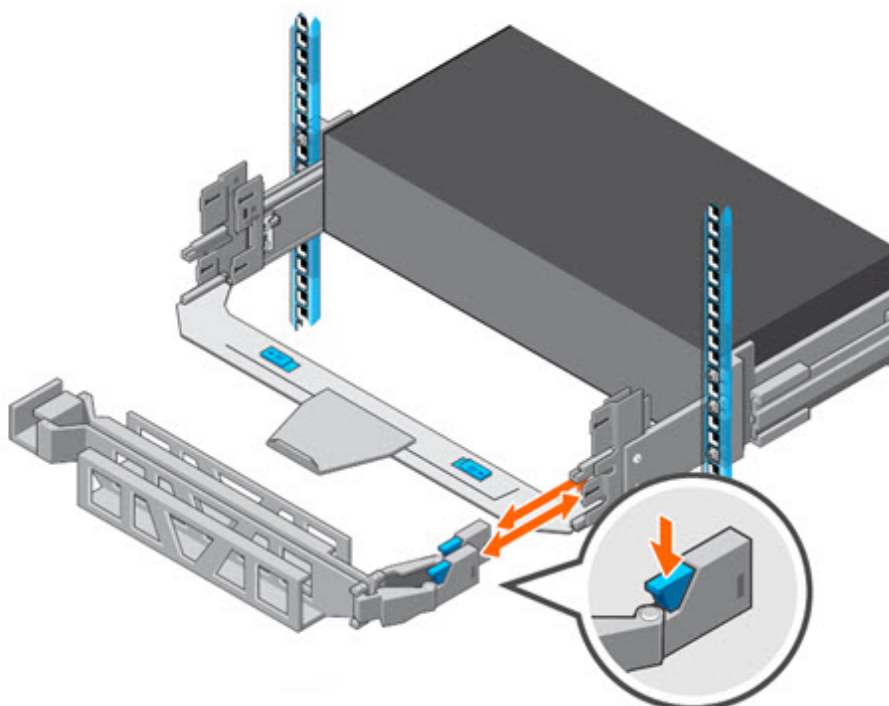
Procedure

1. Install the first separator on the bracket.

Figure 14 Install the first separator

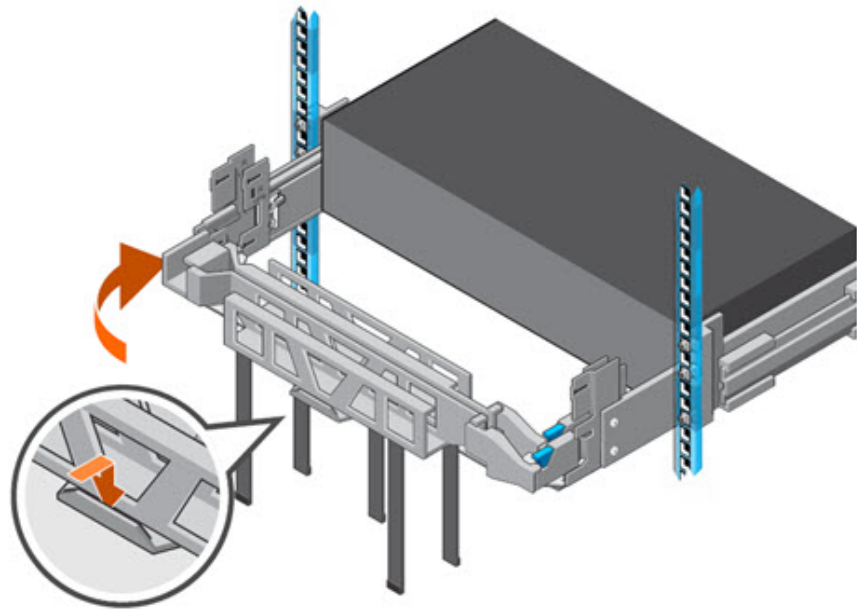
2. Install the first arm on the right side of the chassis, on top of the separator with the open side up.

Note: The arms are reversible.

Figure 15 Install the first arm

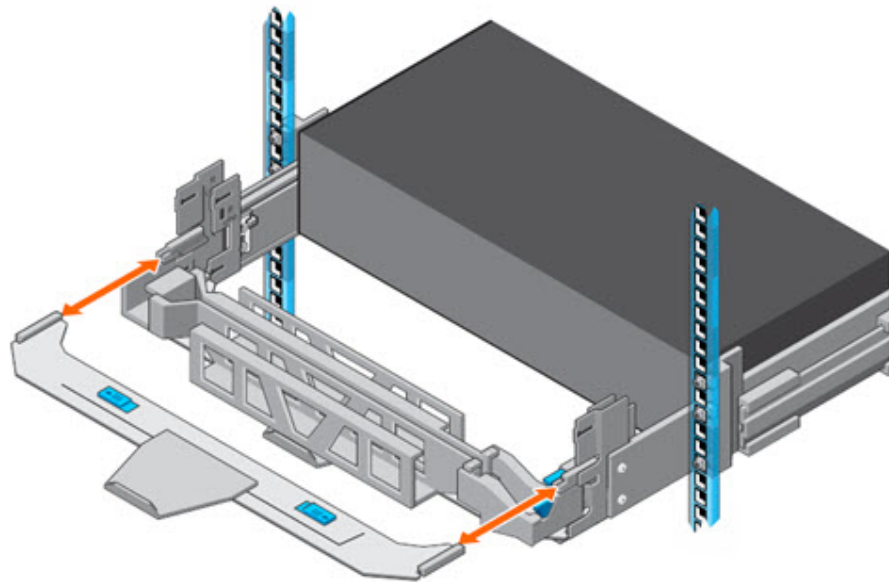
3. Close the first arm by connecting it to the bracket on the left side of the chassis.

Figure 16 Close the first arm

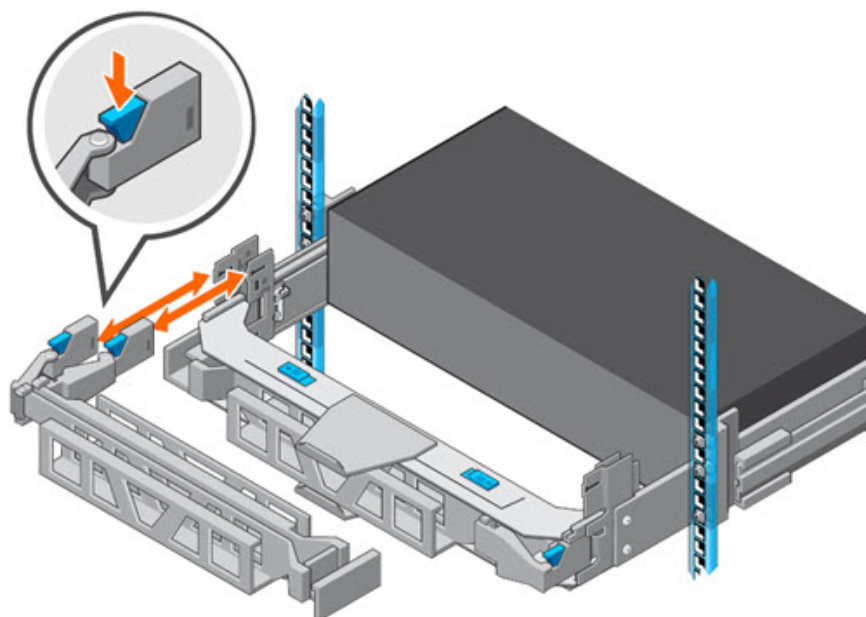


4. Install the second separator on top of the first arm .

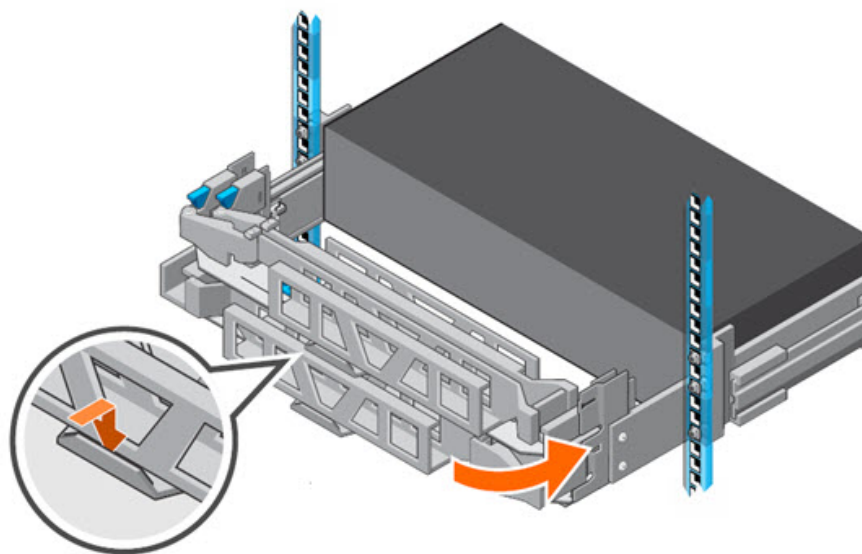
Figure 17 Install the second separator



5. Install the second arm on the left side of the chassis, on top of the separator with the open side up.

Figure 18 Install the second arm

6. Close the first arm by connecting it to the bracket on the right side of the chassis.

Figure 19 Close the second arm

CHAPTER 3

Install the Disk Shelves in the Rack

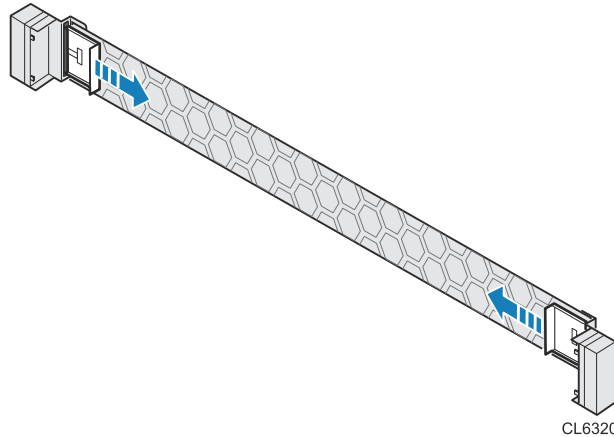
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Remove filler panels

The front space into which you will install the shelf is usually covered by a filler panel. If one or more filler panels cover the space where you want to install the shelf, use this procedure to remove each panel.

Procedure

1. On the filler panel, slide the left and right securing tabs to the open position (towards the center of the panel).



2. Remove the filler panel from the cabinet.

Install a DS60 shelf into the rack

Complete the following steps to install a DS60 expansion shelf.

CAUTION If the top of the shelf is installed above 32U high, a ladder is required to replace disk drives in DS60 shelves.

Installing rails

About this task


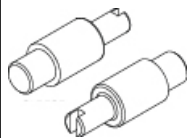
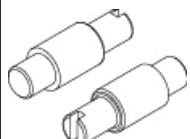
Install the rails from the front of the cabinet where you will install the shelf. The 4U rack includes inner rails that slide into the cabinet rail assembly.

CAUTION Exercise care when installing the short rails. Exposed metal edges may be sharp and could damage cabling or cause injury to personnel.

Procedure

1. Locate the 4U high cabinet space designated for the shelf.
2. If the rail lengths must be adjusted, see [Modifying rail lengths](#).
3. The rails are shipped with M5 adapters, which fit into the Dell EMC NEMA channels. For Dell EMC racks, proceed to step 4. For third-party racks, proceed as follows:
 - a. Using a flat-tipped screwdriver, remove the two M5 adapters from the adapter mounting block on the rails.
 - b. Select the required adapters from the hardware kit and install the adapters into the adapter mounting block. The following table shows the pins for third-party racks.

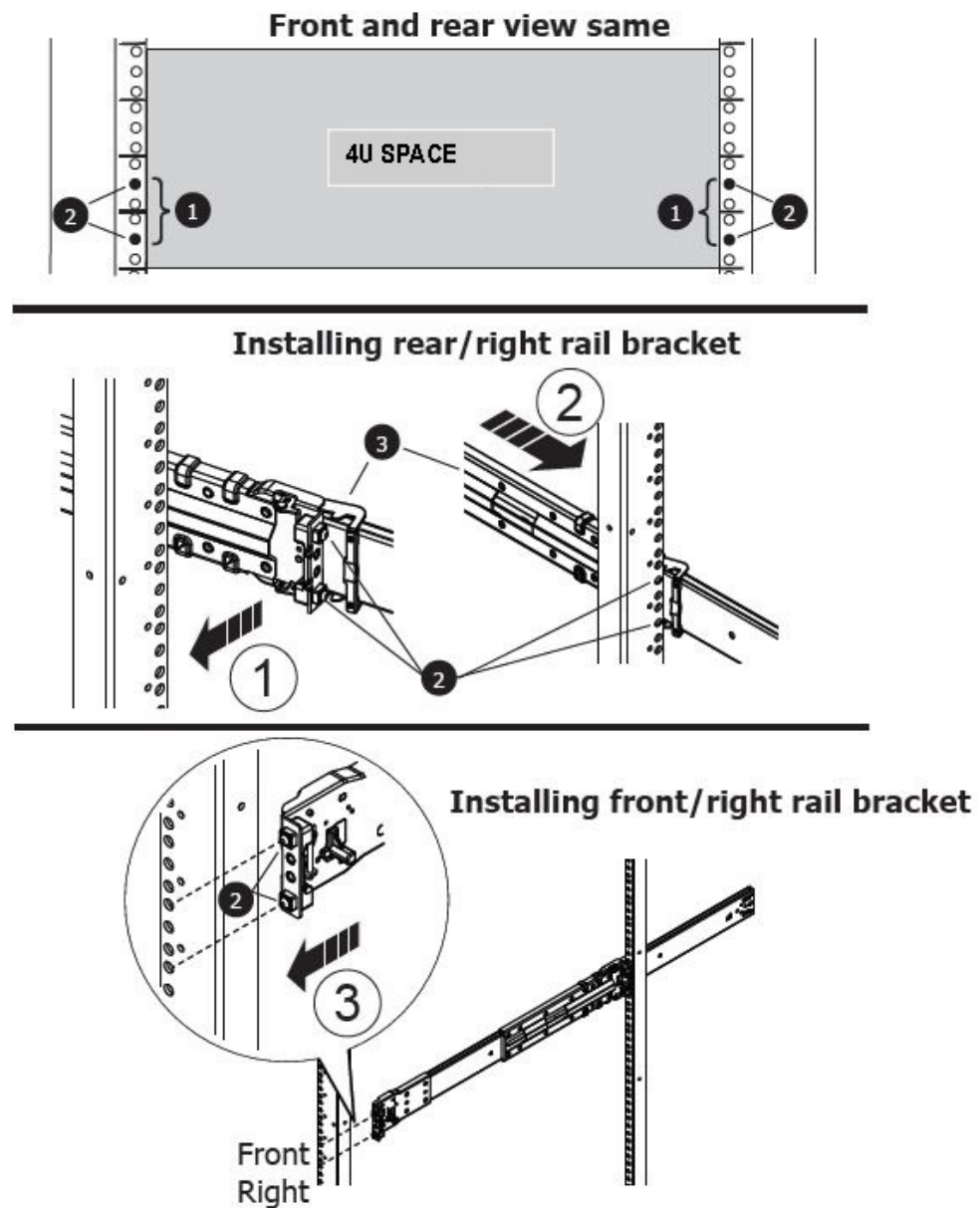
Table 3 Pins for third-party racks

Rail Pins from kit	Part Number and Description	Suggested Use
	036-028-018 Custom screw, M4 x 10MM (Quantity: 4 per kit)	Used for any third-party rack. Can be used in racks with threaded holes.
	036-028-016 3.8MM Alignment Pin (Quantity: 8 per kit)	Used in racks that have M5, #10, or #12 threaded holes.
	036-028-017 4.8MM Alignment Pin (Quantity: 8 per kit)	Used in racks that have M6 threaded holes.

4. Install the right rail to the rack rear channel. You can adjust the rails later, if necessary. The following figure shows the installation details.

Refer to [Figure 22](#) on page 37 while performing the tasks in this step.

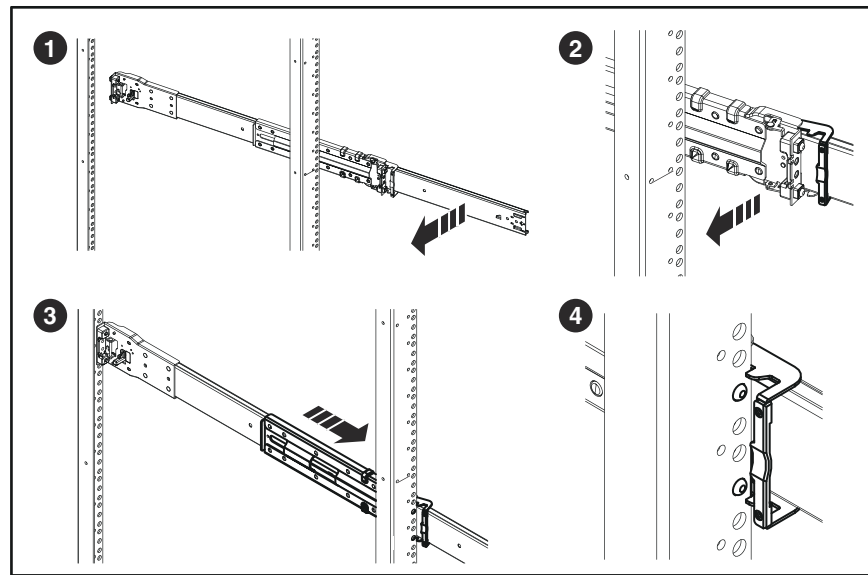
Figure 20 Rail installation



- a. Align the right rail with the lower U of the allotted 4U space.

Note: Each of the rail alignment pins must be located in the middle holes of the bottom two U spaces of the 4U space. See item #4 in the following figure.

- b. With the release latch on the outer (rear) part of the rear channel, place the catch mechanism over the channel.
- c. Push the rail back to secure the rail adapters in the cabinet channel. An audible click indicates that the rail is secure in the channel.
- d. Make sure the rear post/catch mechanism is secure and attached.

Figure 21 Installing the right rail to the rear channel

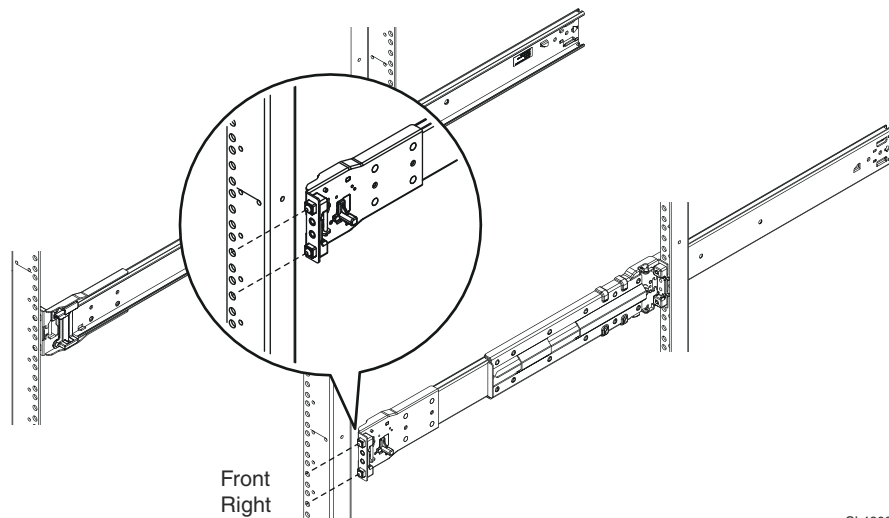
CL4868

5. Install the right rail to the front channel.

Refer to the following figure while performing task in this step.

- a. Align the front of the right rail so that it is level and the front rail pins are aligned with the middle holes of the bottom two U spaces of the 4U space.
- b. Pull the rail forward, with the adapters aligned with the middle holes of the bottom two U spaces of the 4U space.

An audible click indicates that the connection is secure.

Figure 22 Installing the right rail to the front channel

CL4866


6. Install the left rail by repeating step 3 or step 4.
7. On both left and right rail assemblies, install a single long screw between the rail posts in the upper screw hole to secure the rails as follows:
 - a. For Dell EMC racks or racks that do not have threaded holes, insert a single M5 screw into the larger of the two screw holes.

- b. For third-party racks with threaded holes, insert the M4 screw into the smaller of the two screw holes. The screw is smaller than the threaded hole and will pass through the threads.


Installing the shelf onto the rails


Before you begin

If you are installing an empty shelf (all FRUs removed), you can install the chassis without using a lift. If the shelf is populated with FRUs before installation, you must use a portable lift. [Working with a portable lift](#) on page 15 provides more information.


 **DANGER** DO NOT ATTEMPT to install a populated shelf without a mechanical lift. Attempting to install a populated shelf without a lift could damage the equipment and cause injury to personnel.

 **CAUTION** Only install a shelf into a cabinet that is equipped with anti-tip features.

 **Note:** The following procedure shows an installation using the Alum-a-Lift portable lift. If another lift is being used, follow the manufacturer's instructions for that lift as applicable.

 **Note:** A populated shelf requires two people and a lift to install. An unpopulated chassis requires three people to install.

About this task

 **CAUTION** Secure the enclosure to the portable lift using the securing straps before moving the lift.

If you are installing a populated shelf, refer to [Figure 23](#) on page 39 while you perform the steps in this task.

Procedure

1. If a portable lift is not available or cannot access the rack, you must remove the components from the shelf before it is installed on the rails:
 - a. Refer to the procedures for removing the Power Supplies, link control cards (LCCs), and Fan Modules and remove each FRU.
 - b. Refer to the procedure for removing the disk drives and remove the disk drives. Label each disk drive with its exact location so that it can be reinstalled once the shelf is installed in the cabinet.
2. Align the chassis rails with the inner rails that are attached to the cabinet. If you are using a lift, lock the casters into place.


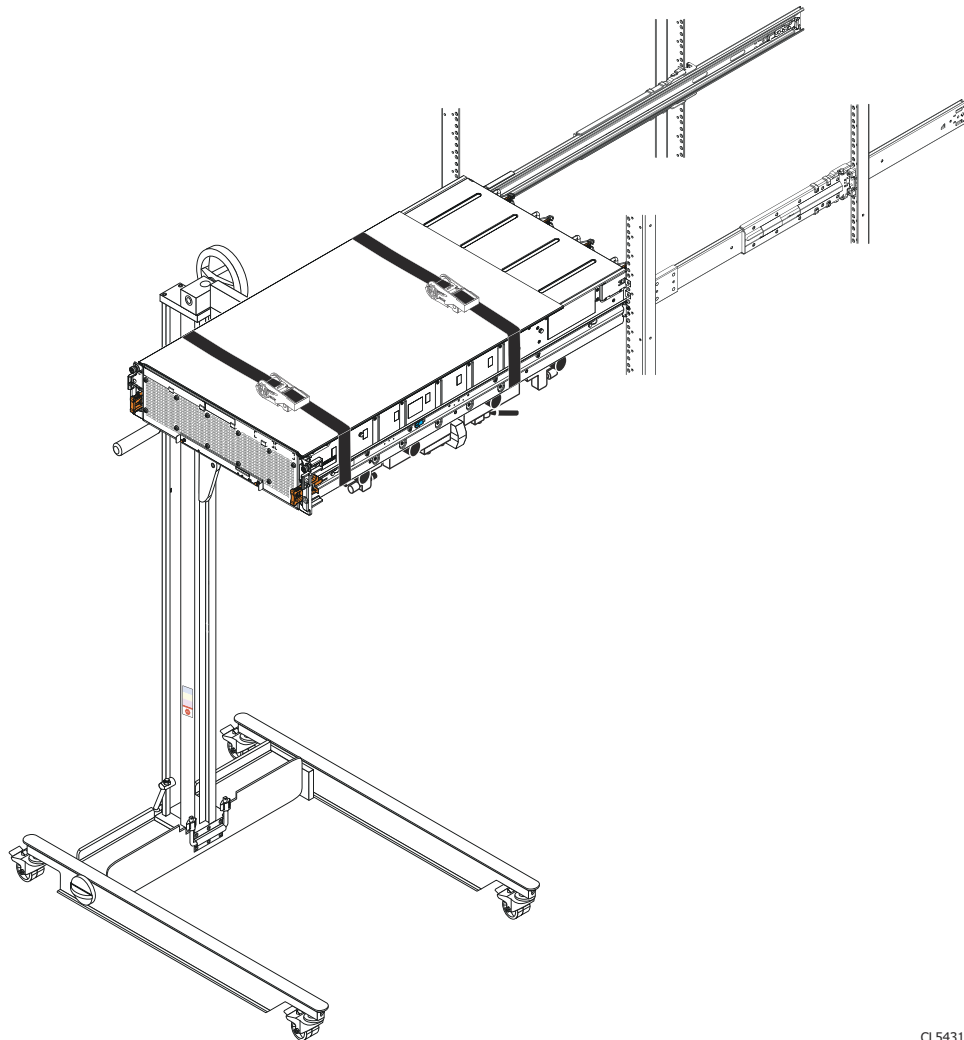
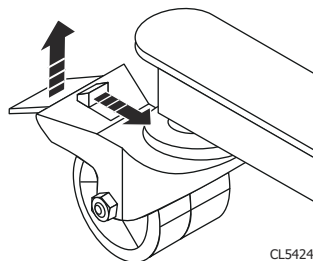
 **Note:** If you are installing the shelf manually without a lift, you will need three people to install it: Two people to hold the chassis in place at the correct height, and one person to align and manage the slides.
3. Manually slide the inner rail over the chassis rail 2-3 inches to line them up.

Figure 23 Sliding the shelf chassis into the rails

CL5431

Note: You might need to release sagging tension on the shelf by pulling the lift arms and tray up slightly.

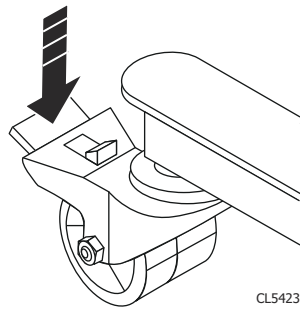
4. Unlock the casters by lifting the locking tabs, as shown in the following figure, and carefully slide the shelf into the cabinet as far as the lift allows.

Figure 24 Unlocking the casters

CL5424

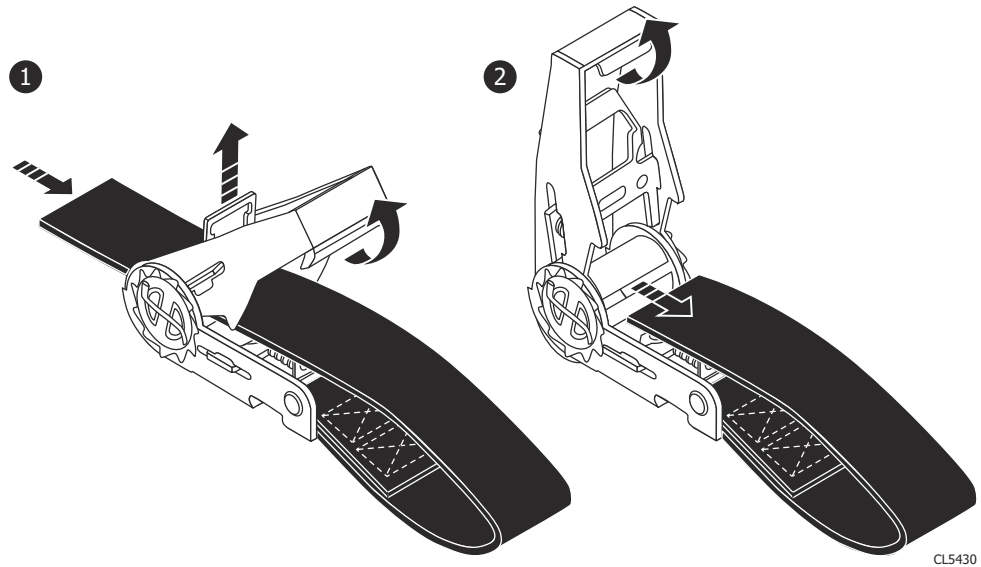
5. Lock all four casters by pressing down on the locking tab, as shown in the following figure, so the lift does not roll as the shelf is pushed into the cabinet.

Figure 25 Locking the casters



6. Remove the securing strap by pulling up on the retaining key and pull the ratchet handle upwards as needed, as shown in the following figure.

Figure 26 Removing the straps



7. Carefully push the shelf off the lift arms/tray and into the cabinet.

CAUTION Make sure to leave the lift under the chassis until the shelf is safely balanced and secured within the cabinet.

8. If the shelf was depopulated before installation, repopulate the shelf as follows:
 - a. Reinstall the disk drives in the exact location from which they were removed.
 - b. Reinstall the Fan modules.
 - c. Slide the shelf into the cabinet.
 - d. From the rear of the cabinet, reinstall the power supplies and the link control cards (LCCs) into the shelf.





Inserting and securing the top cover and shelf

About this task

The captive shoulder screws attach the shelf to the cabinet.

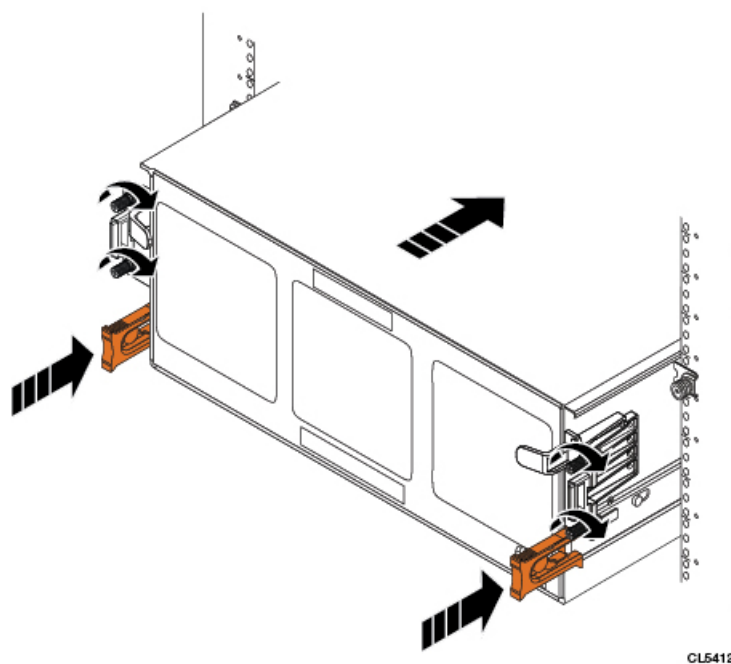
Refer to the following table for installation in third-party racks:

Table 4 Truss head screws

Truss head screw from kit	Part number and description	Suggested use
	036-032-010 Screw, M5-0.8x12, Truss Head Phillips with patch	Can be used in Dell EMC racks and third-party non-threaded hole racks.
	036-032-011 Screw, M6-1.0x12, Truss Head Phillips with patch	Can be used in non-Dell EMC racks.
	036-032-009 Screw, 10-32x.5, Truss Head Phillips with patch	Can be used in non-Dell EMC racks.
	036-032-012 Screw, 12-24x.5, Truss Head Phillips with patch	Can be used in non-Dell EMC racks.

Procedure

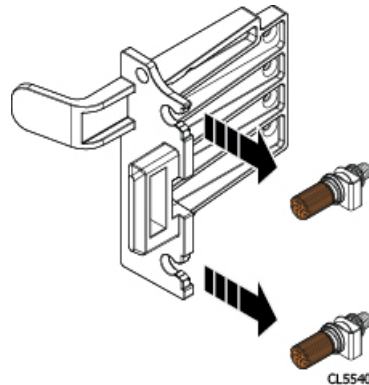
- For Dell EMC racks, use the orange shelf latch handles to push the shelf completely into the cabinet. Align the two semi-captive M5 shoulder screws on each side with the mounting holes on the cabinet. Thread the shoulder screws into the mounting holes and finger-tighten the shoulder screws.

Figure 27 Inserting and securing the shelf to the cabinet (shoulder screw configuration)

- To install the shelf into a third-party rack that is not compatible with the M5 shoulder screws, do the following:

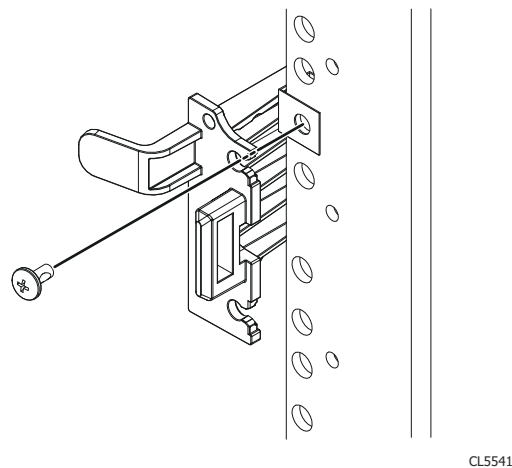
- a. Remove the semi-captive M5 screws by sliding them from the ears.

Figure 28 Removing semi-captive screws



- b. For non-threaded racks, place tinnerman clips that match the truss-head screws over the mounting holes on the rack. Refer to [Table 4](#) on page 41 to select the correct truss head screws.

Figure 29 Installing ears to rack using truss head screws



- c. Use the orange shelf latch handles to push the shelf completely into the cabinet. Secure the shelf to the rack using four truss-head screws.

2. Secure the top cover to the cabinet:

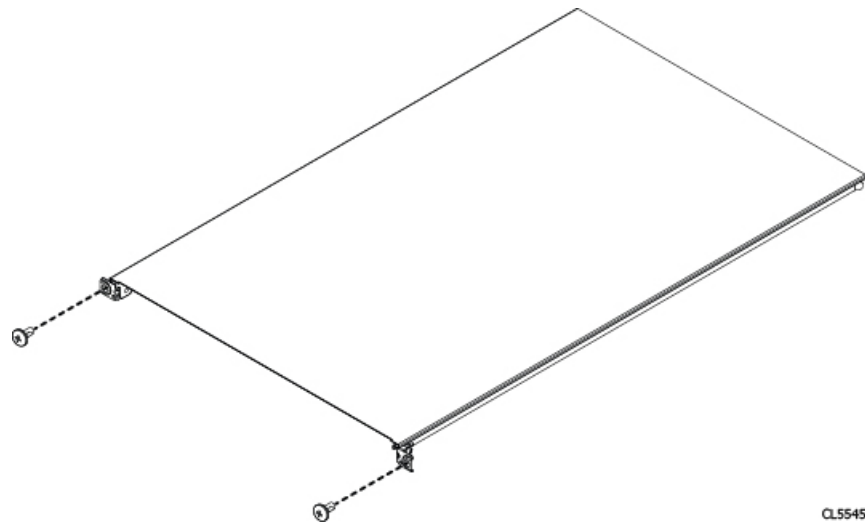
Note:

- Some configurations do not have any hardware installed into the top cover. In these configurations, use the appropriate truss head screw to attach the top cover to the cabinet.
- Some configurations have semi-captive screws in the top cover that will attach to Dell EMC cabinets.
- For third-party cabinets, you can remove the semi-captive screws and use truss head screws to attach the top cover to the cabinet.

To secure a top cover that does not have any mounting hardware, use the screws or pins from the kit that accompanies the device. These screws secure the shelf cover and prevent the cover from coming out of the cabinet during operation. Secure the top cover to the rack as follows:

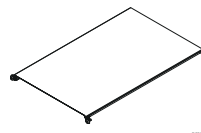
- a. If the shelf is being installed into a Dell EMC rack, secure the top cover to the rack using M5 truss head screws from the kit. Tighten the screws until they are finger tight.
- b. If you are installing the shelf into a third-party rack, identify the mounting holes on the rack that will line up with the mounting holes on the top cover. Refer to [Table 4](#) on page 41 to select the truss head screws to secure the top cover to the rack. For non-threaded racks, place tinnerman clips over the rack mounting holes. Refer to the following figure to attach the top cover to the rack using the appropriate truss head screws from the hardware kit that comes with the shelf.

Figure 30 Installing top cover using truss head screws (shelf and rack not shown)



3. To secure the top cover using a top cover with semi-captive screws, do the following:
 - For a Dell EMC rack, align the semi-captive screws with the mounting hole in the cabinet and thread the screw into the mounting hole.
 - For a third-party rack that is not compatible with the semi-captive screw, remove the semi-captive screw by pulling the screw assembly out the side of the top cover. Identify the mounting holes on the rack that will line up with the mounting holes on the top cover. Refer to [Table 4](#) on page 41 to select the truss head screws to secure the top cover to the rack. For non-threaded racks, place tinnerman clips over the rack mounting holes. Attach the top cover to the rack using the appropriate truss head screws from the hardware kit that comes with the shelf.

Figure 31 Removal of semi-captive screws



1U cable management tray installation (underneath)

This section describes how to install the 1U cable management tray.

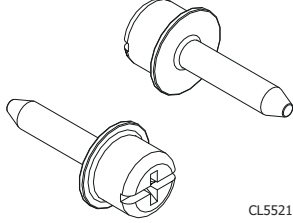
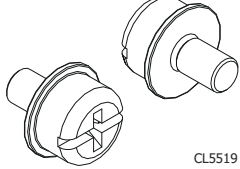
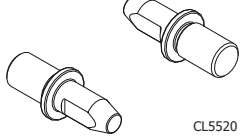
Racks and rails

You can secure the 1U cable tray to Dell EMC and non-Dell EMC racks that use a sliding rail system.

The rail kits are included in the cable tray packaging and are compatible with racks with the following types of holes:

- 3/8 inch square holes
- 9/32 inch round holes
- 10-32, 12-24, M5X.8, or M6X1 pre-threaded holes

The following table shows the hardware and the recommended rack types:

Hardware from kit	Part Number and Description	Recommended Rack Type
 CL5521	036-034-012 Custom Male-Female 8-32 x .75 screw	Always used to secure rails, regardless of Rack Type
 CL5519	036-034-003 Custom square hole pin	These replace the adaptors that come pre-installed in the rails. Used in racks that have .375" square hole mounting rails.
 CL5520	036-034-004 Custom threaded hole pin	These replace the adaptors that come pre-installed in the rails. Used in racks that have threaded holes. These go into the threaded hole for support.

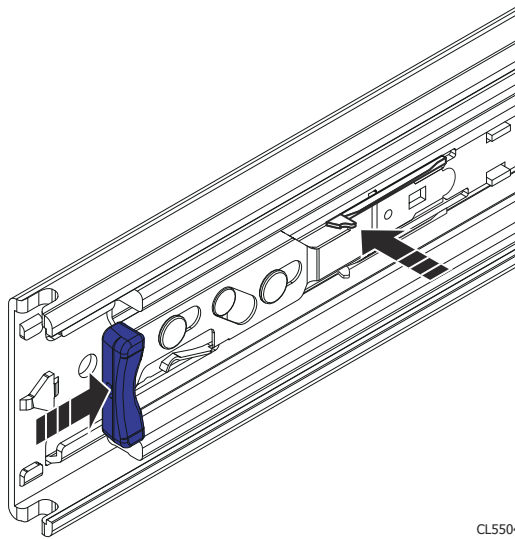
Rail kit mounting brackets adjust in length from 24 inches to 32 inches to accommodate different rack depths.

Installing the 1U cable management tray

The underneath configuration uses the 1U space beneath the shelf. Install the cable management tray before you install the main chassis.

Before you begin

- Ensure that you have determined the correct cable lengths, cable loops, and pigtail lengths. Consult the application guide for the product you are installing to help determine cable lengths.
- Ensure that the blue tab on the shelf rail (directly above where the 1U Cable Management Tray rails will be installed) is pressed in.

Figure 32 Blue tab on rail must be pushed in

CL5504

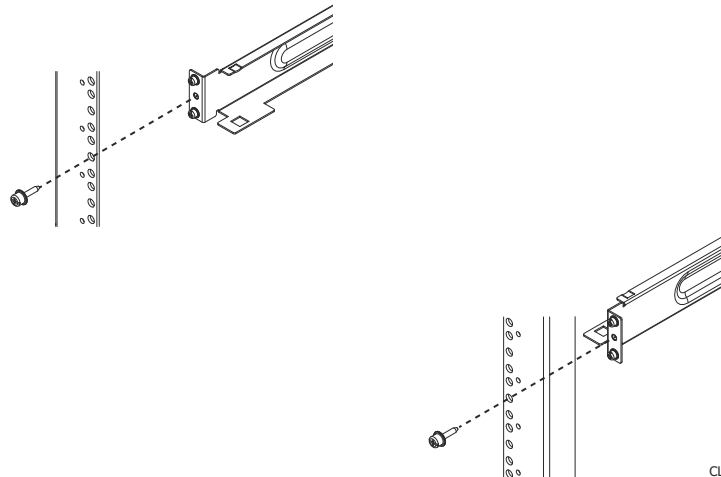
About this task

- Note:** This procedure describes the installation of the 1U cable management tray into a standard Dell EMC rack. For third-party racks, use the additional hardware that comes with the 1U cable management arm to install the rails as necessary.

The rails come preassembled with adapters that fit into standard round mounting holes. If the rack has a different configuration, use the adapters in the hardware kit that come with the tray to mount the rails.

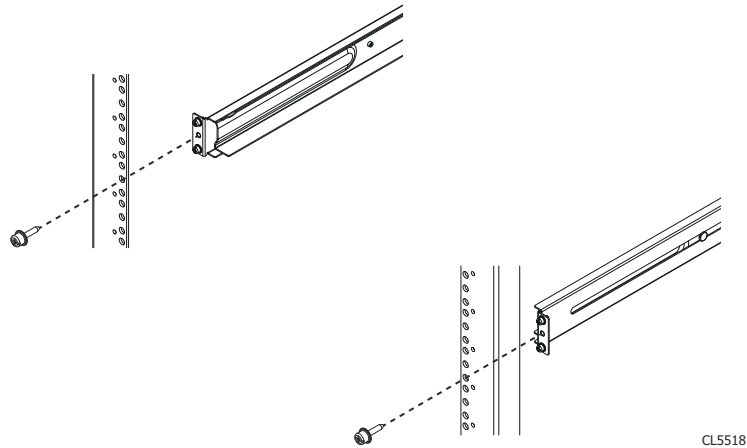
Procedure

1. Identify the left and right rails. Orient the rails so that the UP arrow is pointed up and the end of the rails that are labeled FRONT is at the front of the rack.

Figure 33 Installing and securing the rails—front

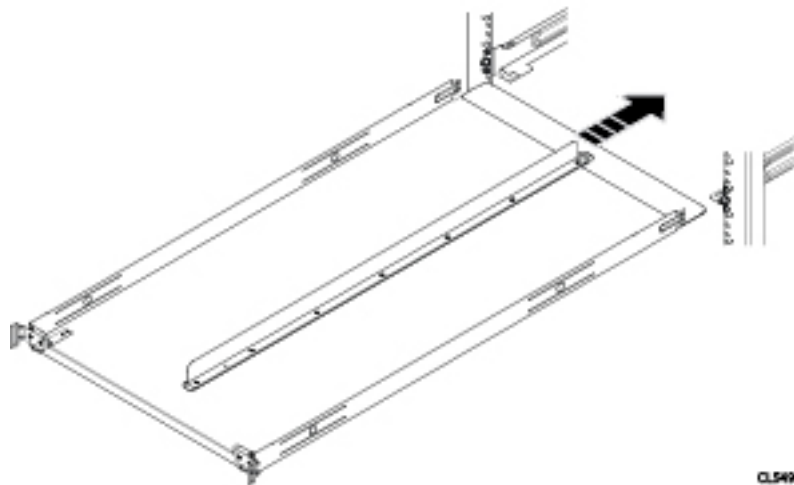
CL5495

Figure 34 Installing and securing the rails—rear

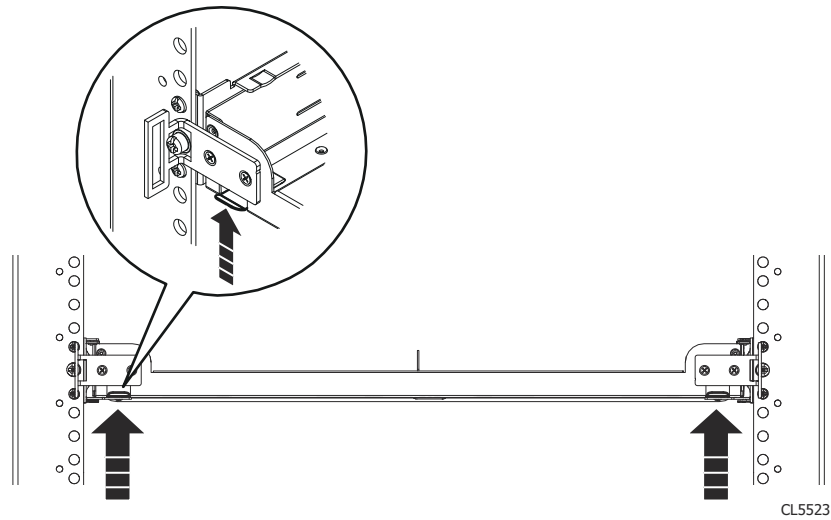


2. Align the flanges on the inside the mounting holes of the rack. Adjust the rails to the fit the rack you are using. Insert the two adapters on the rail into the mounting holes, in both the front and the rear of the rails. Secure the rails to the rack using two knurled screws from the hardware package, one in the front of the rail, and one in the rear of the rail. Torque the screws to 12-16 inch-pounds. Repeat for the other rail.

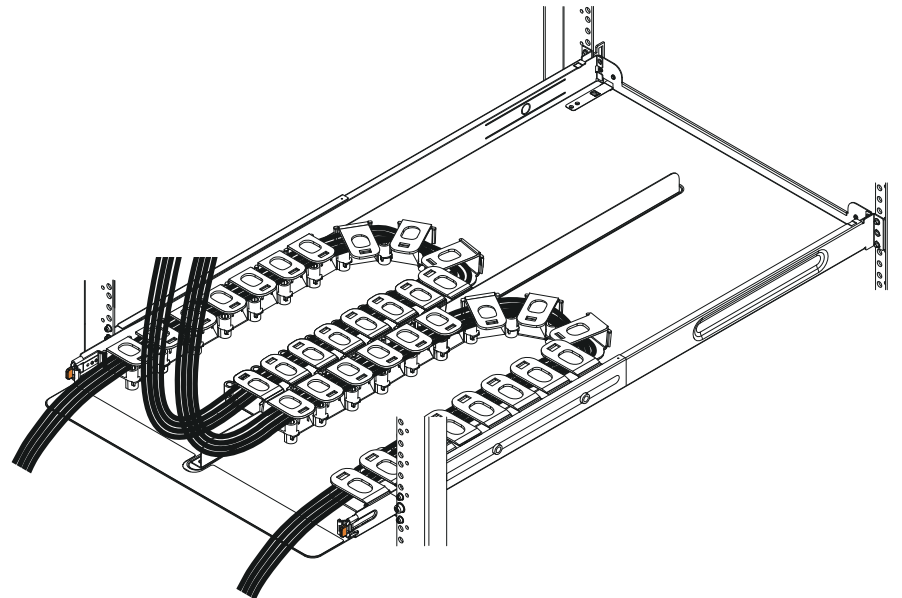
Figure 35 Installing tray



3. Orient the tray so that the UP arrow is pointed up and the end of the tray that is labeled FRONT is to the front of the rack. Slide the tray into the rails until it locks into place with an audible click. To release the tray, press the spring clips up and pull the tray towards the front of the rack.

Figure 36 Spring clips—push up to release tray**Figure 37** Opening the cable chain lids

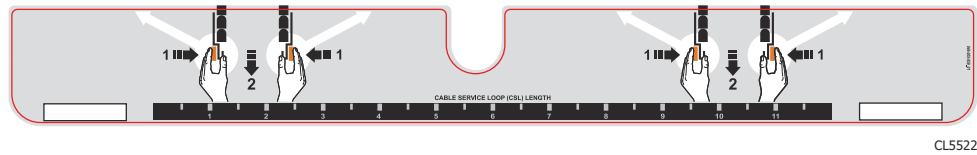
4. Unclip and open all lids on the cable chains.

Figure 38 Cable positioning in cable chains

5. Refer to the application guide for the shelf you are installing. Using the 1-inch graduations on the back edge of the tray, route the cables through the cable chains to their suggested lengths, keeping in mind the correct pig-tail lengths. The two outside cable runs connect to

the rack, while the two inside cable runs connect to the shelf. Once the cables are installed, close the lids, making sure that they are snapped shut.

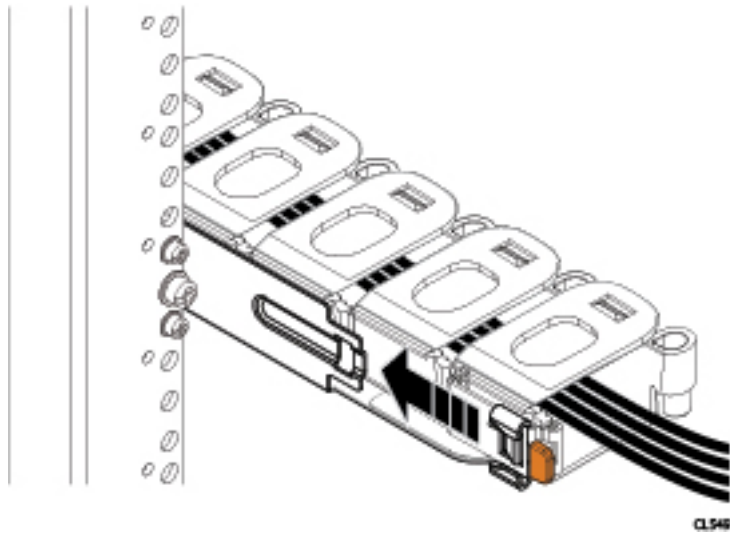
Figure 39 1-Inch graduation label



CL5522

6. Align the lids of the cable chains so the lids are facing up and the hinges are all facing each other. Arrange the two cable chains so that they form a "U" shape.

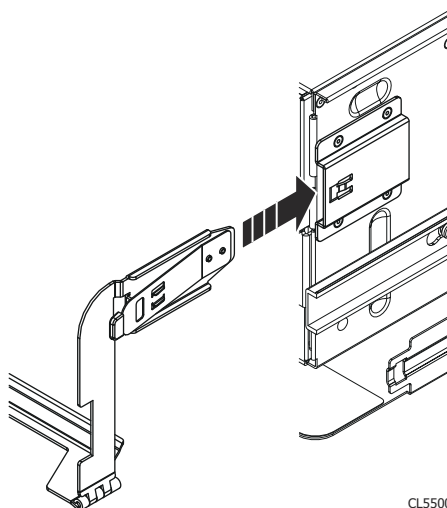
Figure 40 Attaching cable chains to tray



CL5467

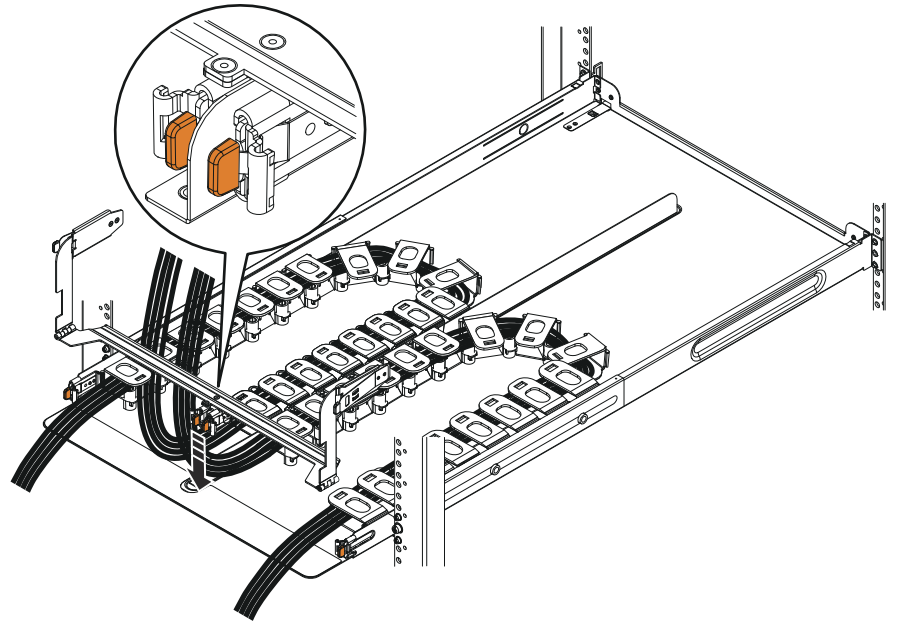
7. Attach the Cable Chains to the tray, by attaching the clips onto the tabs on the rear of the tray.

Figure 41 Installing the chassis bracket into the shelf



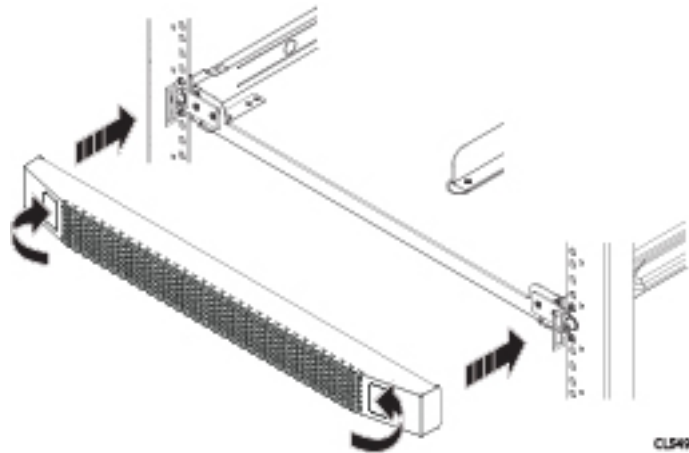
CL5500

8. Snap the chassis bracket clips into the brackets on the side of the chassis.

Figure 42 Installing the chassis bracket

CL5499

9. Place the chassis bracket over the center rail of the cable tray. Clip the free end of the cable chains to the center flange on the chassis bracket.

Figure 43 Installing the bezel

CL5493

10. Place the bezel over the front of the tray by pressing the release buttons on the bezel and placing it over the retaining slots on the tray. Release the buttons and the tabs will mate with the slots.
11. Refer to the application guide and connect the cables as required. Dress the cable runs with proper cable strain reliefs when routing to the rack.

Disconnecting cables for a shelf installed with the 1U cable management tray

When servicing a shelf installed with the 1U cable management tray, cables might need to be disconnected to perform servicing procedures.

Procedure

1. Unplug/disconnect all cables from the rear of the shelf to be serviced.
2. Disconnect the cable guide clips from the chassis.

3. Disconnect the cable guide clips from the 1U cable management tray.
4. Move the cables out of the way to provide access for servicing the shelf.

Third-party rack installation

Follow these best practice guidelines to ensure an orderly installation:

- Third-party racks might have PDUs which face into the rack. This can cause interference between the shelf and/or rear CMAs. Carefully plan and route cables to minimize any interference. It might be necessary to use a type of PDU that is mounted in the main rack area.
- The shelf rails have four adjustment ranges, 18-22", 22-26", 26-30", 30-34". The default length (out of the shipping crate) is the 22-26" setting.
- After installation, check each rail to ensure that it is level and in the correct location before installing the next rail.
- When securing rails to the NEMA channel, especially channels with square holes, install the screws loosely to prevent cross threading, and tighten by hand. Do not over torque.
- Use black M5 screws, which align with both round and square channel holes, to secure all rails and components in the customer racks. Discard all silver screws removed from the shipping rack.

Modifying rail lengths

This procedure details how to extend or shorten the rail lengths to accommodate third-party racks.

About this task

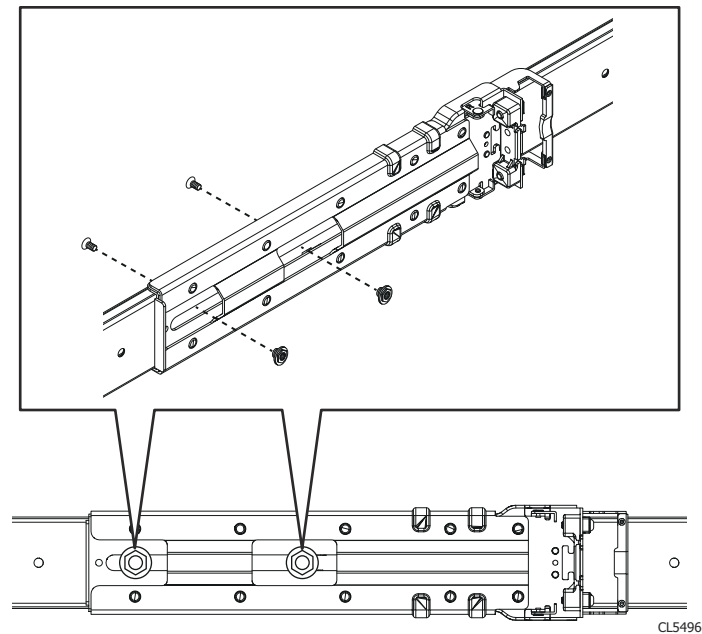
The rails have four adjustment ranges, 18-22", 22-26" (default), 26-30", 30-34". The length adjustments provided in this procedure use the default length of 22-26" as a baseline.

The following links provide the steps for the various adjustment lengths:

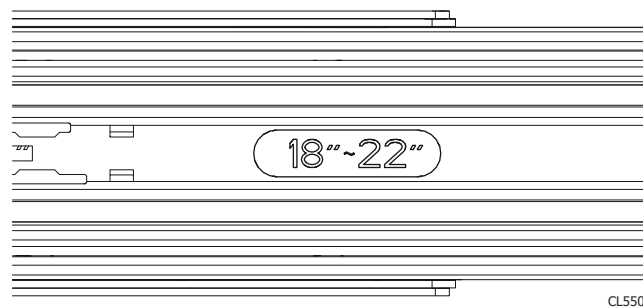
- [18-22" length procedure](#)
- [26-30" length procedure](#)
- [30-34" length procedure](#)

Procedure

- To change the length of the rail to 18-22" (shortest setting) do the following:

Figure 44 Screw and nut placements

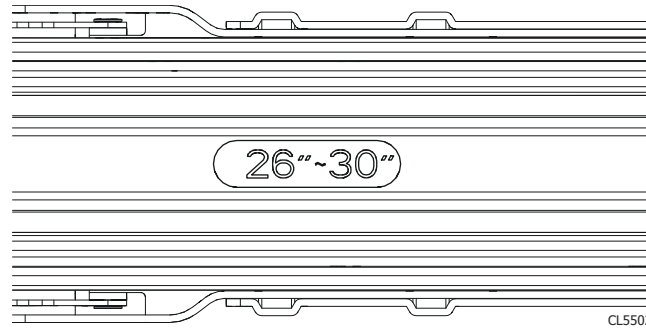
- a. Orient one of the rails to identify the front of the rail so that the inside of the rail is visible with the spacing markings visible.
- b. Locate the two screws and nuts which hold the length adjustment bracket in place.
- c. Using a screwdriver and a nut driver (pliers or vise-grips will work as well), remove both screws and nuts. The length adjustment bracket will be free of the rail.
- d. Move to the front of the rail and align the mounting slots with the mounting holes near the front of the rail.

Figure 45 18"-22" marking

- e. Slide the inner rail mechanism to the front of the rail until the 18"-22" mark is visible. If the inner mechanism is locked, depress the leaf spring and press the rail locking mechanism to free it.
 - f. Adjust the hardware to make sure the mounting holes are aligned with the mounting slots.
 - g. Secure the length adjustment bracket in place using both screws and nuts that were removed earlier.
 - h. Repeat for the other rail.
- To change the length of the rail to 26-30", do the following:
 - a. Orient one of the rails to identify the front of the rail so that the inside of the rail is visible with the spacing markings visible.

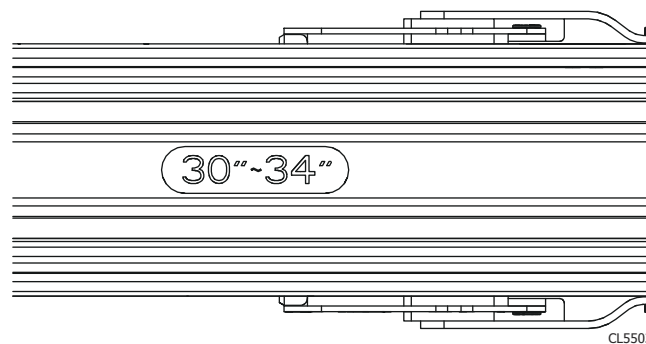
- b. Locate the most forward (closest to the front of the rail) screw and nut which hold the length adjustment bracket in place.
- c. Using a screwdriver and a nut driver (pliers or vise-grips will work as well), remove the forward-most screw and nut.
- d. Slide the length adjustment bracket to the rear of the rail until it stops.

Figure 46 26"-30" Marking



- e. Slide the inner rail mechanism to the rear of the rail until the 26"-30" mark is visible. If the inner mechanism is locked, depress the leaf spring to free it.
 - f. Adjust the hardware to make sure the mounting holes are aligned with the mounting slots.
 - g. Secure the length adjustment bracket in place using the screw and nut that were removed earlier.
 - h. Repeat for the other rail.
- To change the length of the rail to 30-34" (longest setting) do the following:
 - a. Orient one of the rails to identify the front of the rail so that the inside of the rail is visible with the spacing markings visible.
 - b. Locate the two screws and nuts which hold the length adjustment bracket in place.
 - c. Using a screwdriver and a nut driver (pliers or vise-grips will work as well), remove both screws and nuts. The length adjustment bracket will be free of the rail.
 - d. Move the length adjustment bracket to the rear of the rail and align the mounting slots with the mounting holes near the rear of the rail.

Figure 47 30"-34" Marking



- e. Slide the inner rail mechanism to the rear of the rail until the 30-34" mark is visible. If the inner mechanism is locked, depress the leaf spring to free it.
- f. Adjust the hardware to make sure the mounting holes are aligned with the mounting slots.

- g. Secure the length adjustment bracket in place using both screws and nuts that were removed earlier.
- h. Repeat for the other rail.


After you finish

After the rails are adjusted to the proper length, install the rails in the rack.

Installing the rails in a third-party rack

The rails are shipped with 6.8 mm adapters that are designed to fit into the NEMA channels of the Dell EMC rack. For third-party racks, the 6.8 mm adapters must be removed and replaced with rail pins that fit the hole-types in the third-party rack.

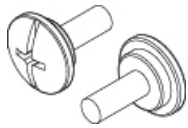
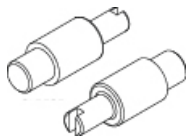
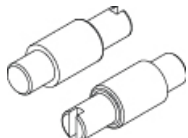
About this task


 **CAUTION** Exercise care when installing the short rails. Exposed metal edges may be sharp and could damage cabling or cause injury to personnel.

Refer to the following tables and figures to install each shelf.

The following table shows the rail pins and their suggested use.

Table 5 Pins for third-party racks

Rail Pins from kit	Part Number and Description	Suggested Use
	036-028-018 Custom screw, M4 x 10MM (Quantity: 4 per kit)	Used for any third-party rack. Can be used in racks with threaded holes.
	036-028-016 3.8MM Alignment Pin (Quantity: 8 per kit)	Used in racks that have M5, #10, or #12 threaded holes.
	036-028-017 4.8MM Alignment Pin (Quantity: 8 per kit)	Used in racks that have M6 threaded holes.

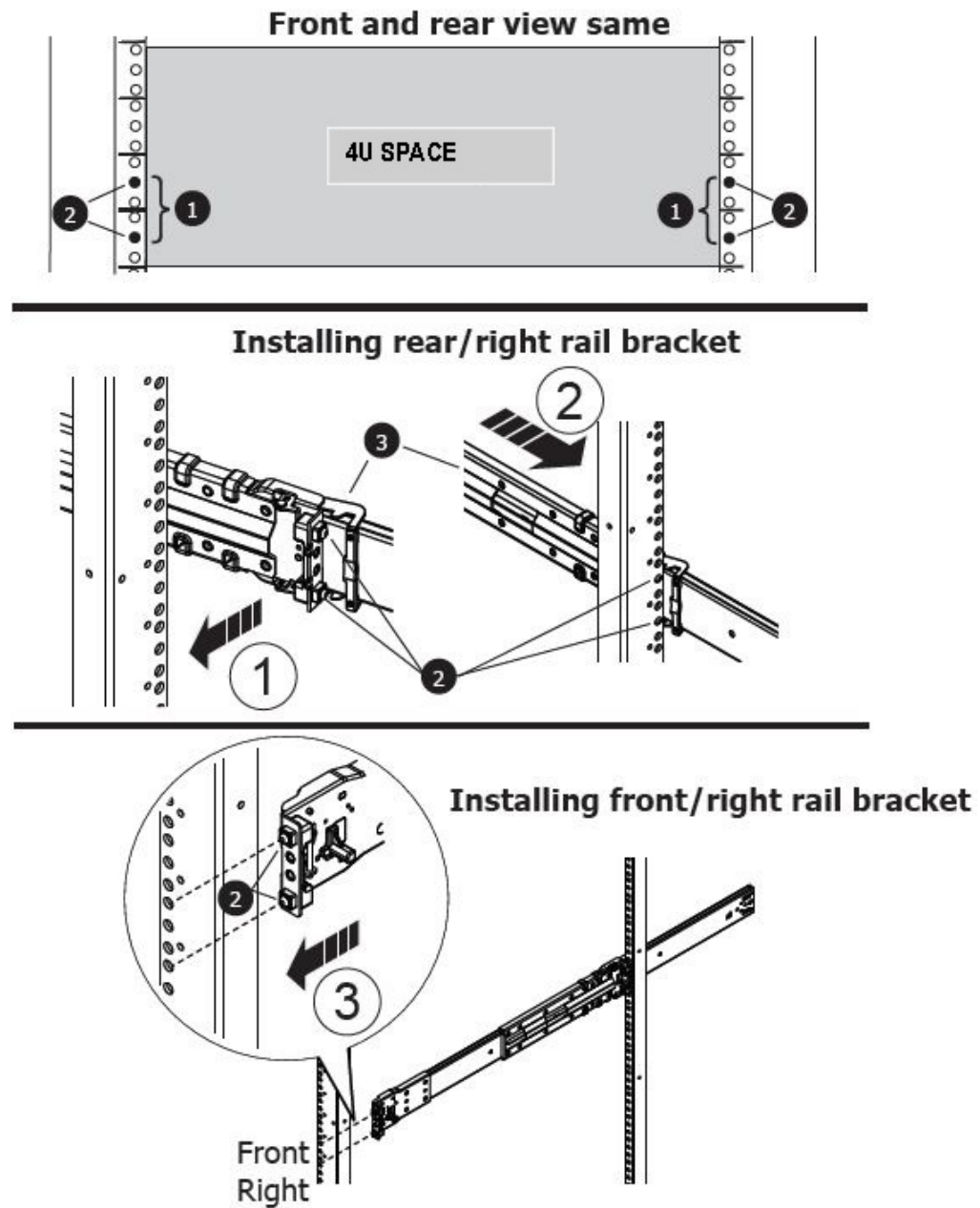
 **Note:** Each of the rail alignment pins must be located in the middle holes of the bottom two U spaces of the 4U space.

The following table lists the parts that are referenced in [Figure 48](#) on page 54.

Table 6 Parts list

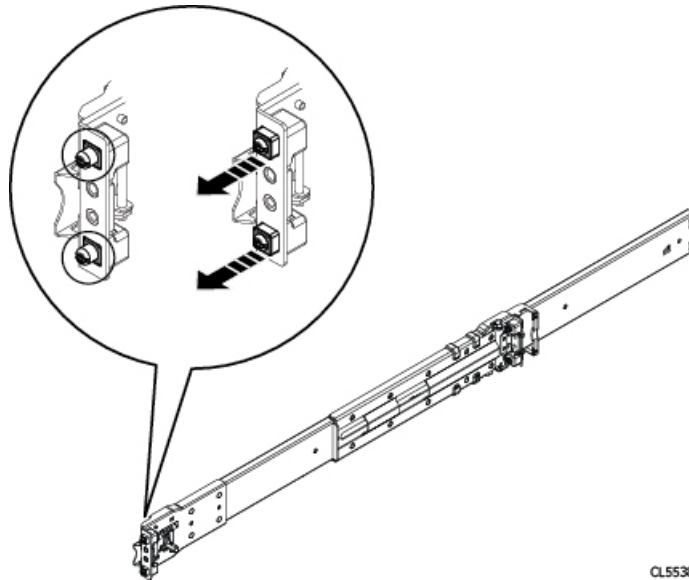
Image #	Description	Qty	Part number
1	Shelf rail location in 4U space	n/a	n/a
2	Universal Rail Pins (see previous table for details)	n/a	Part of PN 106-569-300 and 106-529-209
3	Shelf rails (2 each/kit) for each node	2	PN 106-569-300 and 106-529-209

Figure 48 Rail installation



Procedure

1. Remove the 6.8 mm adapters and replace them with the appropriate hardware from the kit:

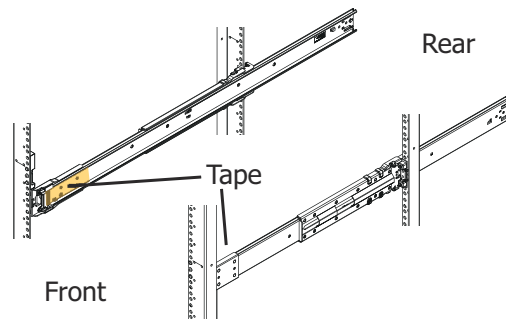


- a. Using a flat-bladed screwdriver, remove the two 6.8 mm adapters from the adapter mounting block on the rails.
 - b. Select the correct adapters from the hardware kit and install the adapters into the adapter mounting block.
2. Locate the 4U rack space designated for the shelf.
3. Install the right rail to the rear channel.
 - a. Align the right rail so that the alignment pins are centered on the middle holes of the bottom two U spaces of the 4U space.
 - b. Move the bracket with the alignment pins to their correct location.
 - c. Push the rail back to secure the rail posts in the cabinet channel.

An audible click indicates that the rail is secure in the channel. Make sure the rear post/catch mechanism is secure and attached.
4. Install the right rail to the front channel.
 - a. Align the front of the right rail so that it is level and the front rail pins are aligned with the middle holes of the bottom two U spaces of the 4U space.
 - b. Pull the rail forward, with the posts aligned with the middle holes of the bottom two U spaces of the 4U space.

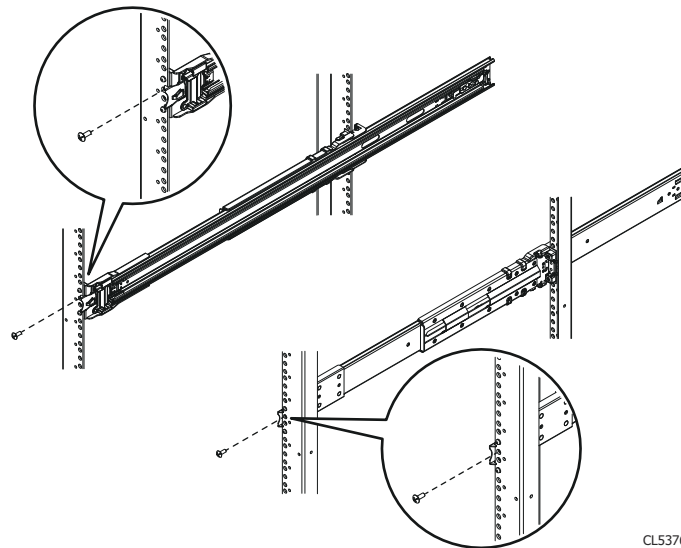
An audible click indicates that the connection is secure.
5. Install the left rail by mirroring the previous steps.
6. Remove the shipping tape that is attached to the node rails.

Figure 49 Removing shipping tape



7. On both left and right rail assemblies, install a single long screw between the rail posts in the center screw hole to secure the rails as follows:

Figure 50 Securing a rail with a single screw

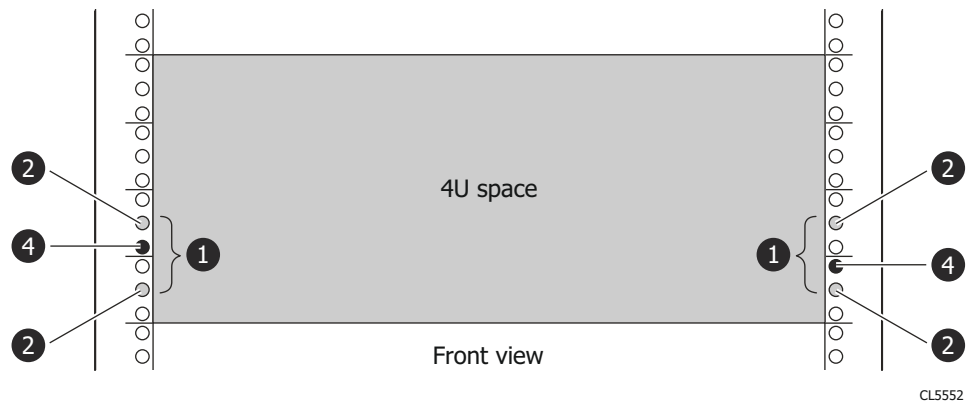


- If you are installing the rails in a rack that has threaded holes, insert an M4 screw into the smaller of the two center screw holes at both the front and the rear of the rail. The screw is smaller and will pass through the threaded hole in the NEMA racks.
- If you are installing the rails in a rack that does not have threaded holes, insert an M5 screw that comes with the chassis into the larger of the two center screw holes in the rail at the front and rear of the rack.

The following table lists the parts that are referenced in [Figure 51](#) on page 57.

Table 7 Parts list

Image #	Description	Qty	Part number
1	Node rail location in 4U space	n/a	n/a
2	Node rail square alignment pins	n/a	Part of PN 100-569-209
4	M5 or M4 securing screws	4	PN 106-002-452 or 036-028-018

Figure 51 Location of securing screws and alignment pins

Installing the nutbars

About this task

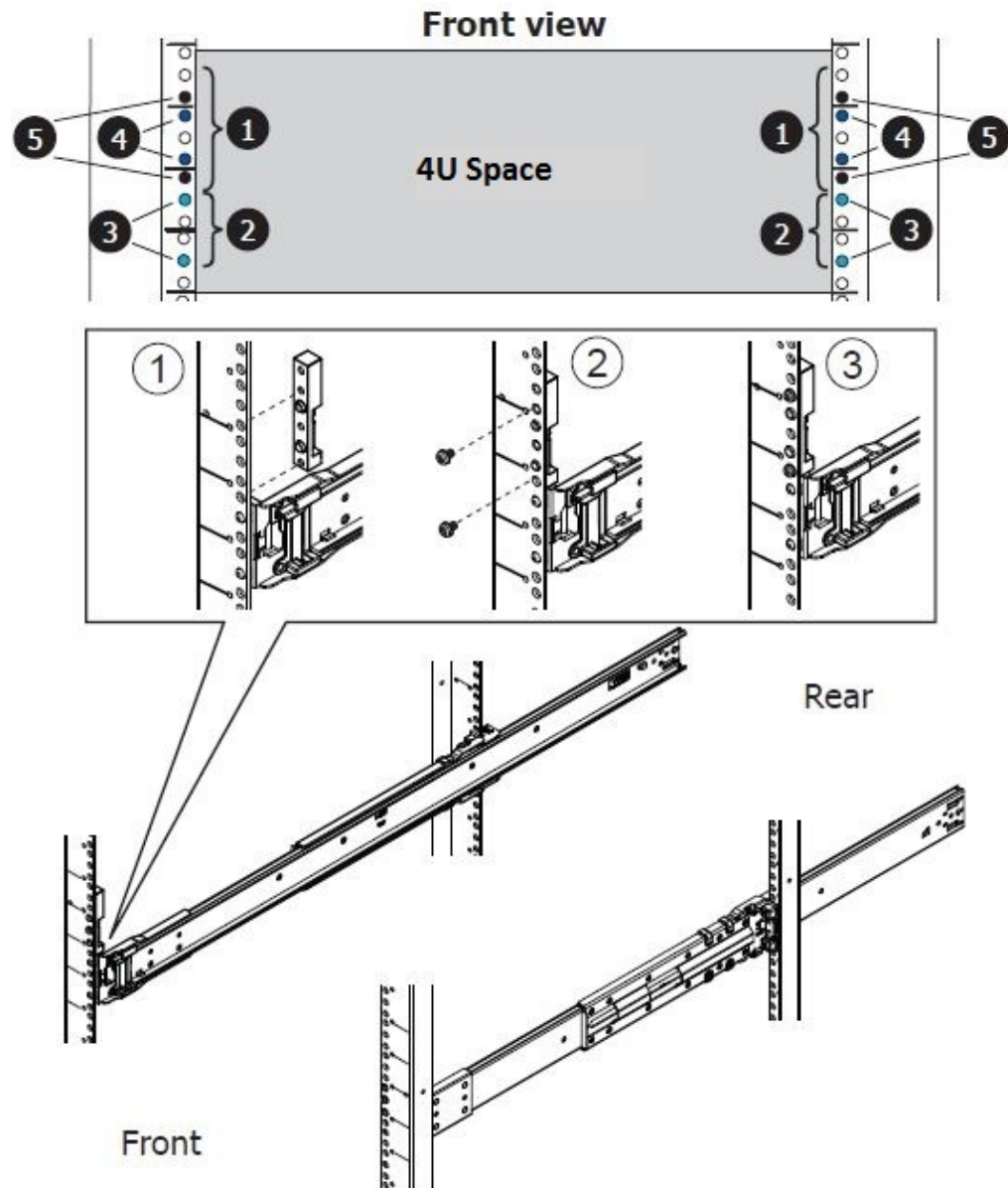
For each shelf, reference the following table, figure, and steps to install the nutbars.

The following table lists the parts that are referenced in the figure below.

Table 8 List of parts used in nutbar installation illustration

Image #	Description	Qty	Part number
1	Nutbar location in 4U space	1 ea	Nutbars: (Left: 051-000-357), (Right: 051-000-356)
2	Rail location in the 4U space	n/a	N/A
3	Rail bracket alignment pins	n/a	N/A
4	Nutbar alignment pins	n/a	Part of PN 051-000-357 and PN 051-000-356
5	Nutbar M5 securing screws, black	4	PN 036-709-013

Figure 52 Nutbar installation (Left nutbar shown)



Note: The nutbars are not interchangeable. There is a distinct nutbar for the left and right side. Use part numbers for identification.

Procedure

1. At the front of the rack, align and install the left nutbar (051-000-357) directly above the rail assembly.
2. Secure the nutbar with two M5 securing screws, one above the top alignment pin and one below the lower alignment pin.
3. Repeat the previous steps for the right nutbar (051-000-356).

Install an FS25 shelf into the rack

If installing an FS25 is required, complete the following steps to install the FS25 SSD shelf.

The rails are compatible with racks with square holes, unthreaded round holes, and threaded round holes.

Installing the rails in the cabinet

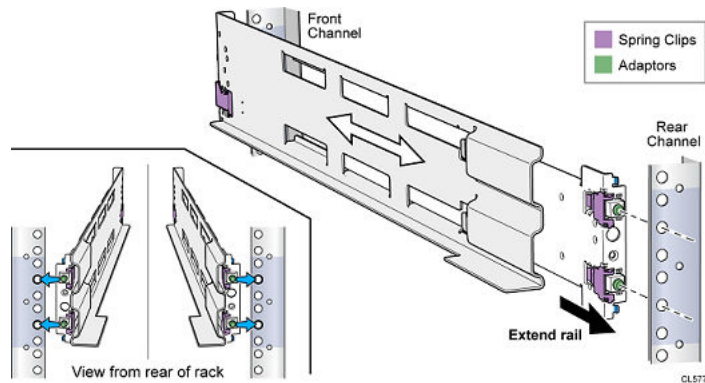
About this task

Note: The snap-in rails are dedicated left and right, and cannot be interchanged.

Procedure

1. Orient the rails. Face the front of the cabinet when orienting the left and right rail placement. The front edge of each rail is stamped L or R.
2. From the rear of the cabinet, insert the adapters into the holes on the rear rack channel with the rail extended as shown in the following figure.

Figure 53 Push rail into rear channel mounting holes



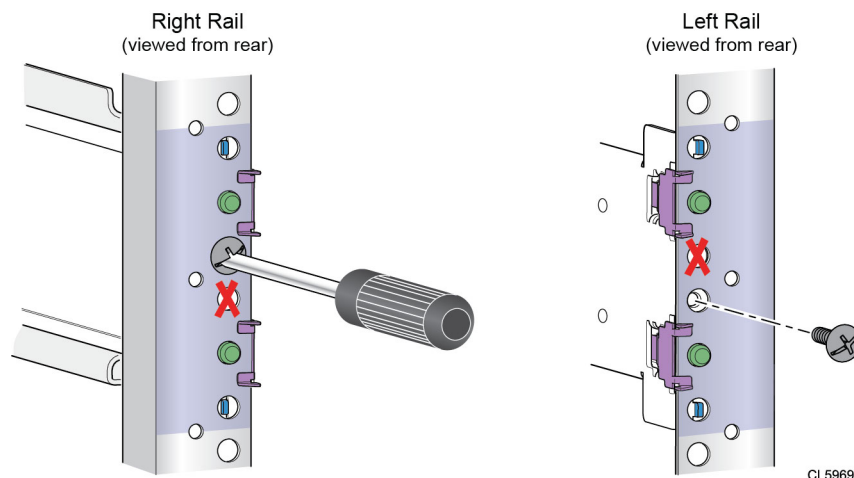
3. Push the rail into the rear mounting holes until the spring clips snap into place on the outside of the rear channel.

CAUTION To ensure proper alignment of the rails, ensure that:

- The holes on the rail line up with the holes on the cabinet.
- The rails are level and using the same cabinet Unit markers from front to rear.

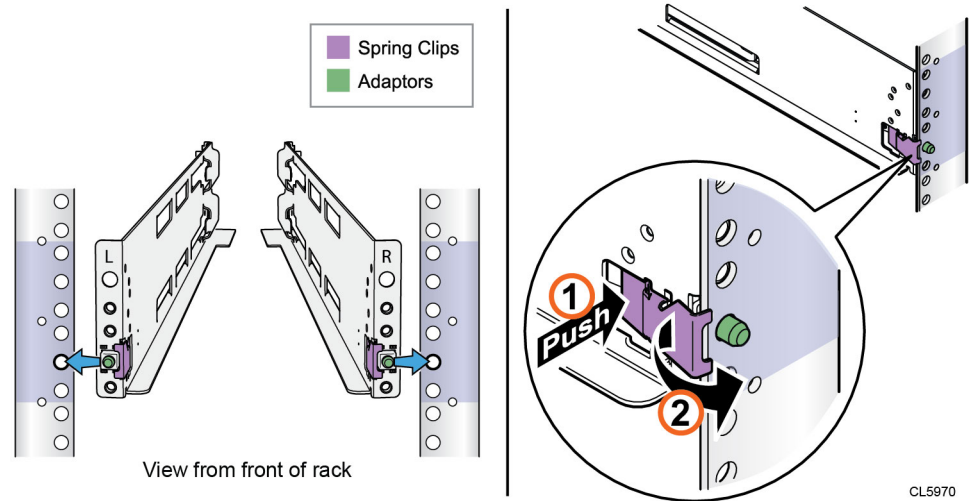
4. From the rear of the cabinet, secure the rails in place using one M5 screw on each rail.

Figure 54 Installing the M5 Screw



- Working from the front of the cabinet, align the adapter with the mounting hole on the front of the rack as shown in the following figure.

Figure 55 Securing rail to front channel



CAUTION To ensure proper alignment of the rails, check that:

- The holes on the rail line up with the holes on the cabinet.
- The rails are level from front-to-back and left-to-right.
- You use the same unit markers from the front of the cabinet to the rear of the cabinet.

- Push in on the spring clip while pulling the rail forward. When the spring clip is forward of the front rack channel, and the adapter is in the mounting holes, release the spring clip so it holds the rail in place.

CAUTION Ensure the spring clip is securely attached to the channel. It may be necessary to push in on the clip to assist in snapping it into place.

Installing the shelf on the rails

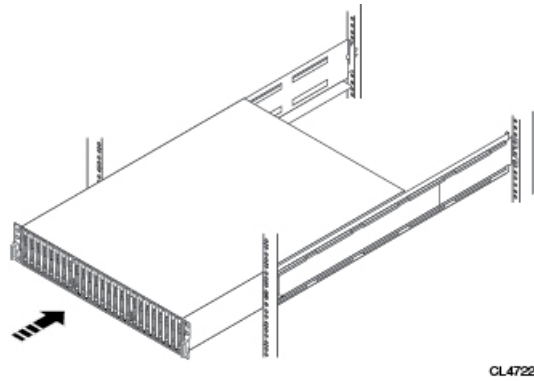
About this task

CAUTION The system components are heavy. To avoid personal injury and/or damage to the equipment, do not attempt to install or remove system components without a mechanical lift and/or help from another person.

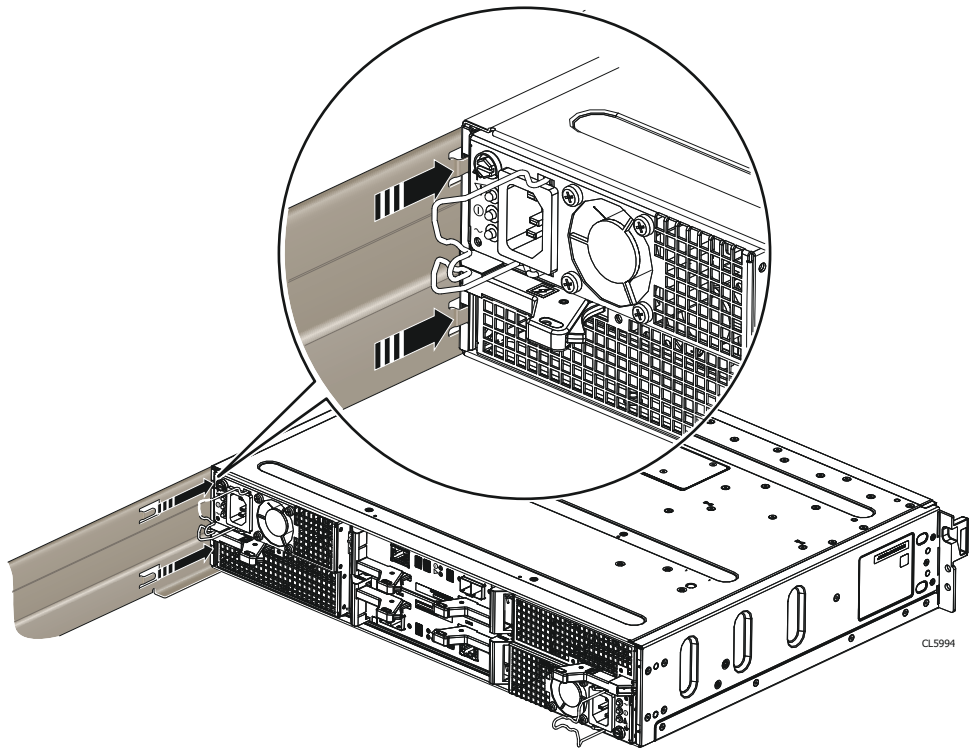
CAUTION Ensure that the rear rail screws on the shelf are installed and fully tightened. If the screws are not installed and tightened, the rails could rotate out of position, possibly causing the shelf to fall, resulting in damage to the equipment and possible injury to personnel.

Procedure

- From the front of the cabinet or rack, lift the shelf and slide it onto the rails.

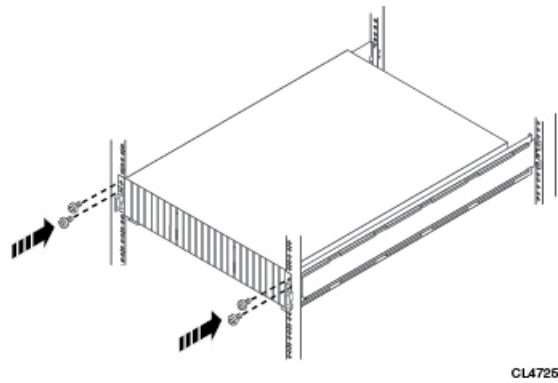
Figure 56 Sliding the shelf onto the rails

When the shelf slides to the back of the cabinet, the rear tabs on the rails click into the notches in the rear of the shelf. The tabs secure and support the rear of the shelf.

Figure 57 Rail tabs securing the rear of the shelf

2. Secure the front of the shelf to the front vertical channels with four screws (two per side), but do not tighten the screws until they are all in place.

Figure 58 Securing the front of the shelf



Installing the front bezel

Before you begin

CAUTION If the protective plastic strip is present on the front of the bezel, remove it before placing the system into operation. Failure to remove the protective plastic strip will cause the system to overheat.

About this task

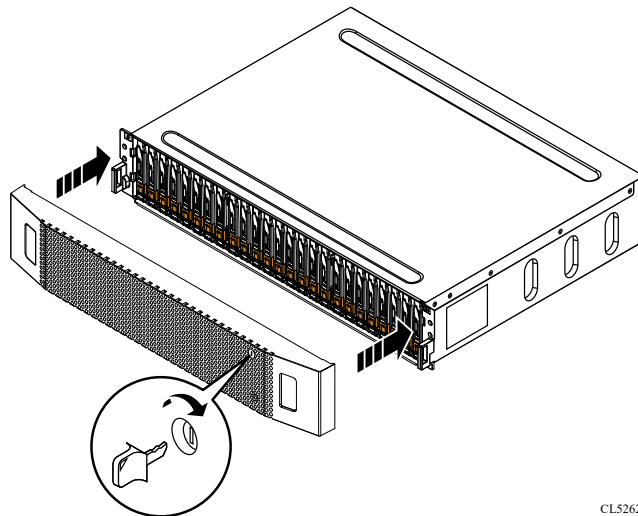
Refer to [Figure 59](#) on page 62 while performing this procedure.

Note: If the rack is equipped with a door on the front, the shelf ships with an EMI shield instead of a bezel.

Procedure

1. If present, remove the protective plastic strip from the front of the bezel.
2. Align the bezel with the enclosure.
3. Gently push the bezel into place on the cabinet until it latches.
4. If the bezel has a key lock, lock the bezel with the provided key.

Figure 59 Installing the bezel



CHAPTER 4

Connect Cables and Power On

• Connecting DS60 shelves.....	64
• Connecting the HA interconnect.....	66
• Connecting data cables.....	67
• Connecting disk shelf power cables.....	68
• Connecting controller power cables and powering on.....	68
• Routing the cables through the CMA.....	69

Connecting DS60 shelves

The cabling diagrams in this section show maximum configurations. Not all systems will have all the disk shelves shown in the diagrams.

When connecting DS60 shelves, all the cables have HD-mini-SAS connectors at both ends.

Add shelf-to-shelf cables between shelves in a loop and to the controller as shown in the diagrams.

Connect an FS25 shelf with DS60 shelves

Connect the FS25 shelf to the controller as shown in the diagrams.

- There are no specific placement or cabling requirements for SSD shelves.
- The SSD shelf counts towards the total number of shelves connected to the system.

Note: The following diagrams show maximum configurations. Not all systems will have everything depicted.

DD9900 with DS60 cabling

The DD9900 system supports a maximum of five shelves. The diagram shows them cabled in two sets of two shelves each, and one set of one shelf. The FS25 SSD shelf is cabled as a separate set from the DS60 shelves.

Table 9 DD9900 with DS60 cabling instructions: Single node or HA primary node

String (Loop)	I/O - Port	Shelf Port	Length ^a
1	I/O 7 - Port A	LCC A, port 0 of shelf V1.1	3M
1	I/O 3 - Port A	LCC B, port 0 of the highest number shelf in V1	3M
2	I/O 7 - Port B	LCC A, port 0 of shelf V2.1	3M
2	I/O 3 - Port B	LCC B, port 0 of the highest number shelf in V2	3M
3	I/O 7 - Port C	LCC A, port 0 of shelf V3.1	3M
3	I/O 3 - Port C	LCC B, port 0 of shelf V3.1	3M
4	I/O 7 - Port D	FS25 LCC B, port A	3M
4	I/O 3 - Port D	FS25 LCC A, port A	3M

a. Cable lengths shown are designed for Dell EMC racks. Longer cables (up to 5M) can be used.

Table 10 DD9900 with DS60 cabling instructions: HA standby node (HA only)

String (Loop)	I/O - Port	Shelf Port	Length ^a
1	I/O 7 - Port A	LCC A, port 2 of the highest number shelf in V1	3M
1	I/O 3 - Port A	LCC B, port 2 of shelf V1.1	3M
2	I/O 7 - Port B	LCC A, port 2 of the highest number shelf in V2	3M
2	I/O 3 - Port B	LCC B, port 2 of shelf V2.1	3M

Table 10 DD9900 with DS60 cabling instructions: HA standby node (HA only) (continued)

String (Loop)	I/O - Port	Shelf Port	Length ^a
3	I/O 7 - Port C	LCC A, port 0 of shelf V3.1	3M
3	I/O 3 - Port C	LCC B, port 0 of shelf V3.1	3M
4	I/O 7 - Port D	FS25 LCC B, port B	3M
4	I/O 3 - Port D	FS25 LCC A, port B	3M

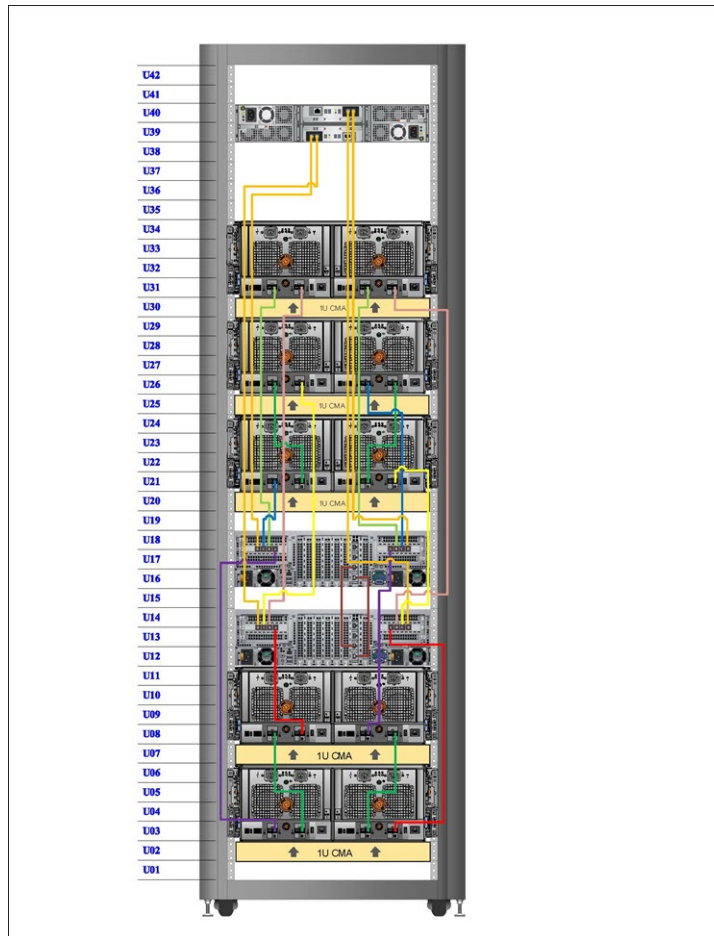
- a. Cable lengths shown are designed for Dell EMC racks. Longer cables (up to 5M) can be used.

Table 11 DD9900 with DS60 cabling instructions: DS60 to DS60

String (Loop)	First Shelf Port	Second Shelf Port	Length ^a
1	LCC A, port 2 of shelf V1.1	LCC A, port 0 of the next shelf in V1	2M
1	LCC B, port 0 of shelf V1.1	LCC B, port 2 of the next shelf in V1	2M
2	LCC A, port 2 of shelf V2.1	LCC A, port 0 of the next shelf in V2	2M
2	LCC B, port 0 of shelf V2.1	LCC B, port 2 of the next shelf in V2	2M

- a. Cable lengths shown are designed for Dell EMC racks. Longer cables (up to 5M) can be used.

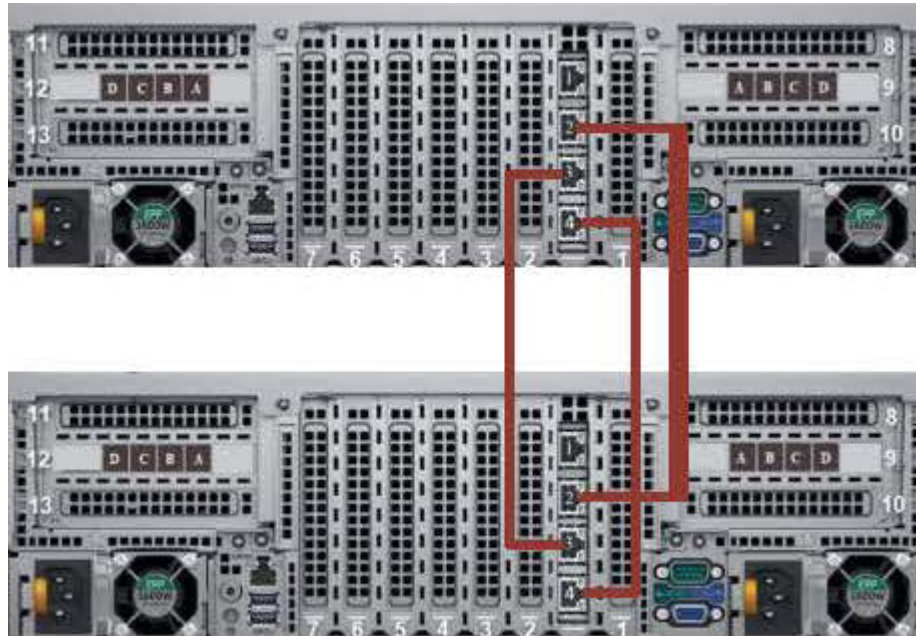
Figure 60 DD9900 with DS60 shelves



Connecting the HA interconnect

Procedure

1. Connect a 10G Base-T cable from port 2 of the network daughter card on the primary node to port 2 of the network daughter card on the standby node.
2. Connect a 10G Base-T cable from port 3 of the network daughter card on the primary node to port 3 of the network daughter card on the standby node.
3. Connect a 10G Base-T cable from port 4 of the network daughter card on the primary node to port 4 of the network daughter card on the standby node.

Figure 61 HA interconnect

Connecting data cables

About this task

The following figures show the I/O module slot numbers.

The slot labeled N is the network daughter card, which contains ports ethMa, ethMb, ethMc, and ethMd.

The physical interface name format for the other I/O module slots is `ethXy`, where X is the slot number and y is an alphanumeric character. For example, `eth0a`.

For most horizontal I/O module NIC interfaces, the port numbering goes from left to right, with `ethXa` on the left. The horizontal I/O module slots on the left-in slots 11-13 are inverted. The port numbering on these I/O modules in these slots goes from right to left, with `ethXa` on the right.

For vertical I/O module NIC interfaces, the port numbering goes from top to bottom, with `ethXa` at the top.

The management port `ethMa` is the first port set up by the Configuration Wizard. It is marked with a red rectangle in the figure below.

Figure 62 Slot numbering

Procedure

1. For 10 GBASE-T connections, use 55m or 100m cat 6 copper cables with RJ-45 connectors.
2. For 10 GbE-SFP+ optical connections, refer to the list of qualified adapters and use an OM1 160 MHz (2 to 26m), OM1 200 MHz (2 to 33m), OM2 400 MHz, (2 to 66m), OM2 500 MHz

(2 to 82m), OM3 1500 MHz (2 to 300m), or OM 4 3500 MHz (2 to 400m) SFP+ optical cable.

3. For 25 GbE-SFP28 connections, use optical cables that support the 25GBASE-SR standard to connect to the 25 GbE-SFP28 optical transceivers.
4. For 100 GbE connections, use copper direct attach (DAC) cables up to 5 m, or active optical cables up to 30 m.
5. For 25 GbE-SFP28 connections, use optical cables that support the 25GBASE-SR standard to connect to the 25 GbE-SFP28 optical transceivers.
6. For FC connections, use a qualified OM1, OM2, or OM3 Fibre Channel optical cable:
For 100GbE QSFP28 direct attach copper (DAC) connections, use DAC cables up to 5m

Table 12 Maximum FC cable lengths

Data rate	OM1 maximum length	OM2 maximum length	OM3 maximum length
4 Gbps	70m	150m	380m
8 Gbps	21m	50m	150m
16 Gbps	15m	35m	100m

Connecting disk shelf power cables

Before you begin

Each disk shelf has two power supplies. Connect each power supply to redundant AC power sources, so the loss of one power supply does not cause the shelf to power off.

About this task

ES40 and FS25 shelves have one power cord per power supply for a total of two power cords. DS60 shelves have two power cords per power supply for a total of four power cords.


Procedure

1. Plug the power cords into both power supplies on the disk shelf.
2. If the disk shelf has a retention bail, secure the power cord with the retention bail. The bail prevents the power cord from pulling out of the connector.
3. Connect each power cord to separate power sources in the rack.
4. Repeat the preceding steps for each shelf in the rack.

Connecting controller power cables and powering on

Procedure

1. Connect the power supply units to the rack.

 **CAUTION** Connect each PSU to a redundant AC power source. Redundant power sources allow one AC source to fail or be serviced without impacting system operation. Connect PSU 0 to one AC source, and PSU 1 to the other AC source.

The system may not power on automatically after plugging in the AC power cords. The system identification button located on the rear of the chassis, on the lower left-hand side illuminates blue when power is on.

2. If the system does not power on automatically after connecting the power cables, press the power button on the right control panel at the front of the chassis to power on the system .

1

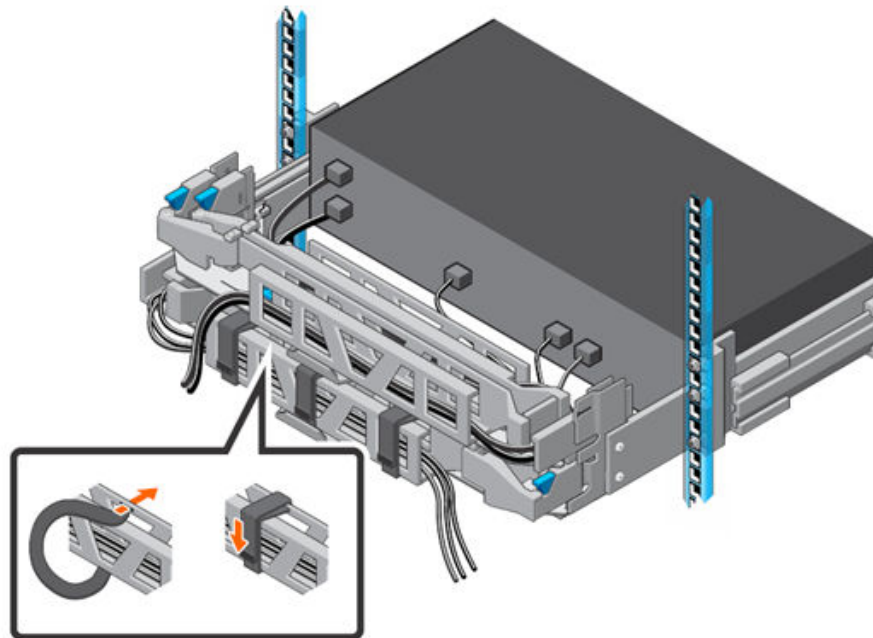


Routing the cables through the CMA

Procedure

1. Run the cables through the CMA.
2. Use velcro straps to keep the cables in place.

Figure 63 Routing cables through the CMA brackets



CHAPTER 5

Configure System for Use

• Configure iDRAC	72
• Configure serial over LAN (SOL)	73
• Change the iDRAC network port	74
• Enable administrative communication	75
• Run the configuration wizard	76
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• Use iDRAC to power the system on and off remotely	91
• Configure HA	92

Configure iDRAC

About this task

The PowerProtect system requires that the Integrated Dell Remote Access Controller (iDRAC) is configured for system upgrade and maintenance operations. Additionally, the system supports the use of iDRAC to change security settings, and remotely power the system on and off.

CAUTION Do not use iDRAC to change the storage configuration, system settings, or BIOS settings, as making changes will impact system functionality. Contact Support if changes are required in any of these areas.

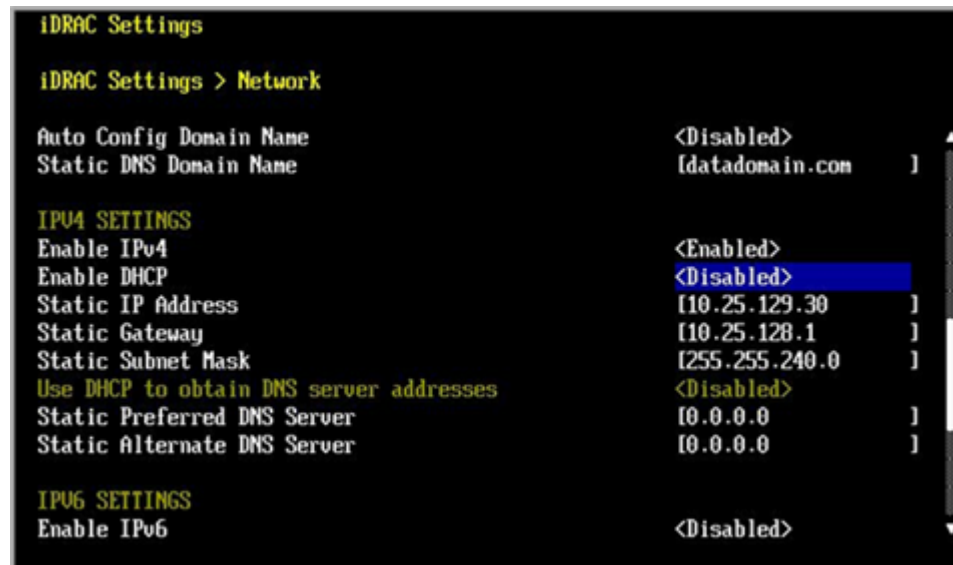
Procedure

1. Connect to the system serial console or connect KVM to the system.
2. Reboot the system.
3. During the system boot process, press **F2** to access the BIOS menu.
4. Select **iDRAC Settings**.
5. Select **Network**.
6. Under **IPv4 Settings**, static IP address details.

Note: DHCP is not supported for the iDRAC IP address.

Note: Press **Shift + Backspace** to delete an existing IP address value over connections with VT100+ keyboard emulation.

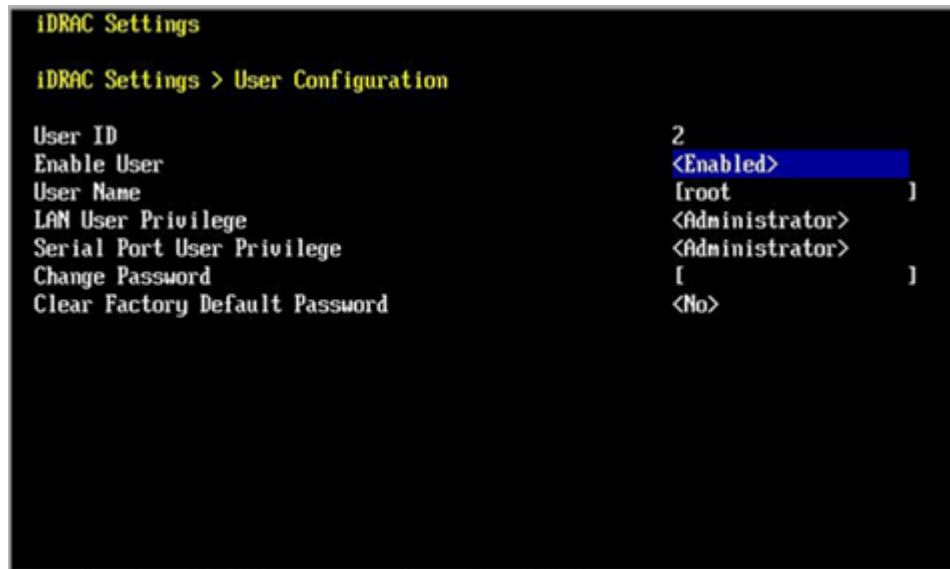
Figure 64 iDRAC Settings > Network



7. Press **Esc** to return to the previous menu.
8. Select **User Configuration**.
 - a. Enable the root user.
 - b. Change the root user password.

Note: The default password is the system serial number. The system serial number is always on the service tag at the front of the system, and on the PSNT tag attached to the rear handle of the chassis if the system has a rear-mounted PSNT tag.

Figure 65 iDRAC Settings > User Configuration



After you finish

Use [iDRAC to power the system on and off remotely](#) on page 91 describes how to power the system on and off with iDRAC.

The *DD OS, PowerProtect DD Virtual Edition, and PowerProtect DD Management Center Security Configuration Guide* provides additional information about accessing security settings in iDRAC.

Configure serial over LAN (SOL)

About this task

The PowerProtect system provides the ability to access the serial console through the iDRAC interface.

Configuring SOL is optional.

If SOL is already enabled on the system, no further action is required.

CAUTION Do not use iDRAC to change the storage configuration, system settings, or BIOS settings, as making changes will impact system functionality. Contact Support if changes are required in any of these areas.

CAUTION Enabling SOL disables the serial console.

Procedure

1. In a web browser, type the iDRAC IP address specified during iDRAC configuration.
2. Login with the user name root. The default password is the system serial number on the PSNT.
3. Select **Configuration > BIOS Settings > Serial Communications**.
4. Verify the following values are configured, and specify any that are not set as listed:


- **Serial Communication:** Auto
 - **Serial Port Address:** Serial Device1=COM2, Serial Device2=COM1
 - **External Serial Connector:** Serial Device 2
 - **Failsafe Baud Rate:** 115200
 - **Remote Terminal Type:** VT100/VT220
 - **Redirection After Boot:** Enabled
5. Click **Apply** to save any changes.
 6. Select **iDRAC Settings > Connectivity > Serial Over LAN**.
 7. Specify the following values if they are not already configured:
 - **Enable Serial Over Lan:** Enable
 - **Baud Rate:** 115.2 kbps
 - **Channel Privilege Level Limit:** Administrator
 - **Redirect Enable:** Enable
 - **Escape Key:** ^\ (Ctrl + \)
 8. Click **Apply** to save any changes.
 9. Select **iDRAC Settings > Services**.
 10. Specify the following values if they are not already configured:
 - a. Select **Enabled for SSH**.
 - b. Verify the Port Number is set to 22.
 11. Click **Apply** to save any changes.
 12. Select **Configuration > BIOS Settings > Serial Communications**.
 13. Click **Apply and Reboot**.
 14. Select **Maintenance > Job Queue** and verify the `Configure: BIOS.Setup` job is complete.

 **Note:** Click **Refresh** to get the latest status

Change the iDRAC network port

About this task

iDRAC provides the ability to disable the dedicated iDRAC Ethernet port and assign the iDRAC connection to share one of the network daughter card Ethernet ports. This step is optional.

 **CAUTION** Do not configure iDRAC to use network daughter card ports 2, 3, and 4, as they are reserved for the HA interconnect.

Procedure

1. Connect to the system serial console or connect KVM to the system.
2. Reboot the system.
3. During the system boot process, press **F2** to access the BIOS menu.
4. Select **iDRAC Settings**.
5. Select **Network**.

- Under **Network Settings**, change **NIC Selection** from **Dedicated** to one of the following values:

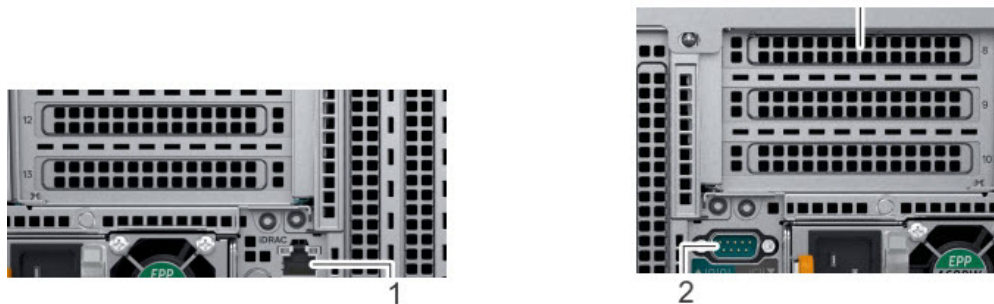
Table 13 iDRAC NIC to physical port mapping

iDRAC NIC selection	Physical network port
LOM1 - [NIC Integrated 1-1-1]	Network daughter card port 1
LOM2 - [NIC Integrated 1-2-1]	Network daughter card port 2
LOM3 - [NIC Integrated 1-3-1]	Network daughter card port 3
LOM4 - [NIC Integrated 1-4-1]	Network daughter card port 4

- Press **Esc** to return to the previous menu.
- Exit the BIOS menu and reboot the system to allow the change to take effect.

Enable administrative communication

The serial port and dedicated iDRAC9 dedicated management port at the rear of the system are the only supported interfaces for console access. Do not connect to the USB and iDRAC direct micro-USB port on the front of the system.



Use the following settings:

Table 14 Communications settings

Setting	Value
Baud rate	115200
Data bits	8
Stop bits	1
Parity	None
Flow control	None
Emulation	VT-100

Establish a serial connection

- Connect the DB-9 cable to the serial port on the back panel of the system (#2 in the figure above).
- Launch a terminal emulation program from your computer and configure the following communication settings:

- Note:** Set the baud rate to 115200 for the system to work correctly; 9600 baud rate does not work.

3. Press `Enter` to activate the console.

Note:

- It can take up to 5 minutes for the system to display console messages.
- The system can take up to 15 minutes to complete the boot process. If you do not see the prompt on your terminal to log in, complete Step 4.

4. Verify the front blue power LED is on. If it is not, make sure the power cables are fully seated at both ends, and all AC sources are on.

Establish an SOL connection

1. Connect the RJ-45 cable to the iDRAC management port on the back panel of the system (#1 in the figure above).
2. Run the `ssh <iDRAC-IP-address> -l <iDRAC-username>` command to access iDRAC
3. Log in with the credentials for the iDRAC username.
4. Run the `console com2` command to initiate the SOL session.

Log in to the system console

1. Log in to the system console using the `sysadmin` username.

```
localhost.localdomain login: sysadmin
```

2. Type the default password, which is the system serial number. The system serial number is a 14-character alphanumeric string starting with "APM." The sticker with the serial number on it is located on the front of the system.

```
Password: system_serial_number
```

- Note:** If you type an incorrect password four consecutive times, the system locks out the specified username for 120 seconds. The login count and lockout period are configurable and might be different on your system. See the *DD OS Administration Guide* and the *DD OS Command Reference Guide* for setting these values.

Run the configuration wizard

The CLI configuration wizard starts automatically the first time the system starts. The wizard prompts you through a series of questions that provide just enough information for initial system configuration and basic network connectivity.

- Note:** You can begin the CLI configuration wizard manually by typing `config setup`.

Configuring the network

Procedure

1. Enter `yes` to configure the system for network connectivity.

```
Network Configuration
Configure Network at this time (yes|no) [no]:
yes
```

2. Enter `yes` to configure DHCP (Dynamic Host Configuration Protocol) to obtain network parameters (such as, the host name, domain name, and IP addresses) dynamically from a DHCP server. Or enter `no` to configure the parameters manually.

```
Use DHCP
Use DHCP for hostname, domainname, default gateway
```

and DNS servers? (At least one interface needs to be configured using DHCP) (yes|no|?)

3. Enter a fully qualified domain name (FQDN) for the host name; for example, **str01.yourcompany.com**. Or accept the host name, if the system was able to discover it.

Enter the hostname for this system
(fully-qualified domain name) []:

4. Enter the DNS (Domain Name System) domain name; for example, **yourcompany.com**. Or accept the domain name, if the system was able to discover it.

Domainname
Enter your DNS domainname []:

5. Enable and configure each Ethernet interface. Accept or decline DHCP for each interface. If the port does not use DHCP to discover network parameters automatically, enter the information manually.

Ethernet port eth0a
Enable Ethernet port eth0a (yes|no|?) [yes]:
no

Ethernet port eth0b
Enable Ethernet port eth0b (yes|no|?) [no]:
yes

Use DHCP on Ethernet port eth0b (yes|no|?) [no]:

Enter the IP address for eth0b [192.168.10.185]:

Enter the netmask for eth0b [255.255.255.0]:

6. Enter the IP address of the default routing gateway. Or accept the default gateway, if the system was able to discover it.

Default Gateway
Enter the default gateway IP address:
192.168.10.1

7. Enter the IPv6 address of the default routing gateway. Or accept the IPv6 address of the default gateway, if the system was able to discover it. If IPv6 is not in use, leave the field empty, and press **Enter** to continue.

IPv6 Default Gateway
Enter the ipv6 default gateway IP address:

8. Enter up to three DNS servers to use for resolving host names to IP addresses. Use a comma-separated or space-separated list. Enter a space for no DNS servers. Or accept the IP addresses of the DNS servers, if the system was able to discover them.

DNS Servers
Enter the DNS Server list (zero, one, two or three IP addresses):
192.168.10.1

9. A summary of the network settings is displayed. You can accept the settings (**save**), reject the settings and exit to the CLI (**cancel**), or return to the beginning of the current section and change the settings (**retry**). Entering **retry** displays your previous responses for each prompt. Press **Return** to accept the displayed value or enter a new one.

```
Pending Network Settings
Hostname          dd9900.example.com
Domain name       example.com
Default Gateway    192.168.10.1
DNS Server List    192.168.10.1
-----
ethMa  yes      running  no      192.168.10.1
255.255.252.0  n/a
                                fe80::3680:ddf:fe42:2660** /64
                                2620:0:170:2532:3680:ddf:fe42:2660** /64
ethMb   no      down      ipv4    n/a
                                n/
```

```

a
ethMc    no      n/a      down    ipv4    n/a      n/
a
ethMd    no      n/a      down    ipv4    n/a      n/
a
eth5a    no      n/a      down    no      n/a      n/
a
eth5b    no      n/a      down    no      n/a      n/
a
eth6a    yes     n/a      running no      (not specified) (not
specified)
eth6b    yes     n/a      running no      fe80::f6e9:d4ff:fe7f:eea0 /64
specified)
eth6c    no      n/a      down    no      n/a      n/
a
eth6d    no      n/a      down    no      n/a      n/
a
eth8a    no      n/a      down    no      n/a      n/
a
eth8b    no      n/a      down    no      n/a      n/
a
eth8c    no      n/a      down    no      n/a      n/
a
eth8d    no      n/a      down    no      n/a      n/
a
-----
-----
Do you want to save these settings (Save|Cancel|Retry):

```

Configuring additional system parameters

About this task

Most installations would benefit from the configuration of a few additional system parameters, provided in this section for convenience.

Note: You can also use the Data Domain (DD) System Manager GUI interface to configure the system parameters. Open a web browser, and enter your Data Domain system's IP address in the browser's address text box. Log in when the DD System Manager login screen displays. Use the DD System Manager online help for more information.

Procedure

1. To set up the mail server, enter:

```
# config set mailserver mail.datadomain.com
The Mail (SMTP) server is: mail.datadomain.com
```

2. To set up the system location, enter:

```
# config set location "Dallas Regional Data Center Lab,
5000 Apple Drive Suite #130, Dallas, Tx"
The System Location is: Dallas Regional Data Center Lab,
5000 Apple Drive Suite #130, Dallas, Tx
```

3. To add one or more time servers, enter:

```
# ntp add timeserver 192.168.101.1
Remote Time Servers: 192.168.10.1
```

4. To enable the NTP daemon, enter:

```
# ntp enable
NTP enabled.
```

5. To change the system time zone, enter:

```
# config set timezone US/Central
The Timezone name is: US/Central
*** You made a change to the timezone setting. To fully effect this
```

```
change
*** (in currently running processes), you need to reboot the machine.
```

6. Reboot the system for the time zone change to take effect:

```
# system reboot

The 'system reboot' command reboots the system. File access is
interrupted during the reboot.
Are you sure? (yes|no|?) [no]: yes

ok, proceeding.
The system is going down for reboot.
```

7. After the system completes the reboot, login again as `sysadmin` using the serial number as a password. Press `Ctrl-C` to get through the EULA, `sysadmin` password prompt, and config setup wizard.
8. Generate an autosupport sent to yourself to use as ACG input:

```
# autosupport send your.email@emc.com
OK: Message sent.
```

Configuring the system with the configuration wizard

The protection system provides two wizards: a DD System Manager configuration wizard and a Command Line Interface (CLI) configuration wizard. The configuration wizards guide you through a simplified configuration of your system to get your protection system operating quickly.

About this task

After you complete the basic configuration with a wizard, you can use additional configuration controls in DD System Manager and the CLI to further configure your system.

Note: The following procedure describes how to start and run the DD System Manager configuration wizard after the initial configuration of your protection system. For instructions on running the configuration wizards at system startup, see the *Installation Guide* for your system model.

Note: To configure your system for HA, use the CLI Configuration Wizard. For more information, see the *Installation Guide* for the HA-capable system.

Procedure

1. Select **Maintenance > System > Configure System**.
2. Use the controls at the bottom of the Configuration Wizard dialog box to select which features to configure and to advance through the wizard. To display help for a feature, click the help icon (question mark) in the lower left corner of the dialog box.

License page

The License page displays all installed licenses. Click **Yes** to add, modify, or delete a license, or click **No** to skip license installation.

License Configuration

The **Licenses Configuration** section enables you add, modify, or delete licenses from a license file. DD OS 6.0 and later supports licensing via the Electronic License Management System (ELMS), which enables you to include multiple features in a single license file upload.

When using the Configuration Wizard on a system with no licenses configured, select the license type from the drop-down, and click the ... button. Browse to the directory where the license file resides, and select it for upload to the system.

Table 15 License Configuration page values

Item	Description
Add Licenses	Select this option to add licenses from a license file.
Replace Licenses	If licenses are already configured the Add Licenses selection changes to Replace Licenses . Select this option to replace the licenses already added.
Delete Licenses	Select this option to delete licenses already configured on the system.

Network


The **Network** section enables you to configure the network settings. Click **Yes** to configure the network settings, or click **No** to skip network configuration.

Network General page

The General page enables you to configure network settings that define how the system participates in an IP network.

To configure these network settings outside of the configuration wizard, select **Hardware > Ethernet**.

Table 16 General page settings

Item	Description
Obtain Settings using DHCP	Select this option to specify that the system collect network settings from a Dynamic Host Control Protocol (DHCP) server. When you configure the network interfaces, at least one of the interfaces should be configured to use DHCP.
Manually Configure	Select this option to use the network settings defined in the Settings area of this page.
Host Name	Specifies the network hostname for this system. <div>  Note: If you choose to obtain the network settings through DHCP, you can manually configure the hostname at Hardware > Ethernet > Settings or with the <code>net set hostname</code> command. You must manually configure the host name when using DHCP over IPv6. </div>
Domain Name	Specifies the network domain to which this system belongs.
Default IPv4 Gateway	Specifies the IPv4 address of the static default gateway to which the system will forward network requests when there is no route entry for the destination system.
Default IPv6 Gateway	Specifies the IPv6 address of the static default gateway to which the system will forward network requests when there is no route entry for the destination system.

Network Interfaces page

The Interfaces page enables you to configure network settings that define how each interface participates in an IP network.

To Configure these network settings outside of the configuration wizard, select **Hardware > Ethernet > Interfaces**.

Table 17 Interfaces page settings

Item	Description
Interface	Lists the interfaces available on your system.
Enabled	Shows whether each interface is enabled (checkbox selected) or disabled (not selected). Click the checkbox to toggle the interface between the enabled and disabled states.
DHCP	Shows the current Dynamic Host Control Protocol (DHCP) configuration for each interface. Select v4 for IPv4 DHCP connections, v6 for IPv6 connections, or no to disable DHCP.
IP Address	Specifies an IPv4 or IPv6 address for an interface on this system. To configure the IP address, you must set DHCP to No .
Netmask	Specifies the network mask for this system. To configure the network mask, you must configure a static IP address and set DHCP to No .
Link	Displays whether the Ethernet link is active (Yes) or not (No).

Network DNS page

The DNS page enables you to configure IP addresses for DNS servers to convert hostnames to IP addresses and vice versa.

To Configure these network settings outside of the configuration wizard, select **Hardware > Ethernet > Settings**.

Table 18 DNS page settings

Item	Description
Obtain DNS using DHCP.	Select this option to specify that the system collect DNS IP addresses from a Dynamic Host Control Protocol (DHCP) server. When you configure the network interfaces, at least one of the interfaces should be configured to use DHCP.
Manually configure DNS list.	Select this option when you want to manually enter DNS server IP addresses.
Add (+) button	Click this button to display a dialog box in which you can add a DNS IP address to the DNS IP Address list. You must select Manually configure DNS list before you can add or delete DNS IP addresses.
Delete (X) button	Click this button to delete a DNS IP address from the DNS IP Address list. You must select the IP address to delete before this button is enabled. You must also select Manually

Table 18 DNS page settings (continued)

Item	Description
	configure DNS list before you can add or delete DNS IP addresses.
IP Address Checkboxes	Select a checkbox for a DNS IP address that you want to delete. Select the DNS IP Address checkbox when you want to delete all IP addresses. You must select Manually configure DNS list before you can add or delete DNS IP addresses.

File System

The **File System** section allows you to create the file system, and configure Active Tier, Cache Tier, and Cloud Tier storage. Each has a separate wizard page. The configuration pages cannot be accessed if the file system is already created.

Cache Tier storage is part of the configuration wizard for the following system models that come with SSDs for cache storage:

- DD6900
- DD9400
- DD9900


Cloud Tier storage is optional, and you can configure it later. The file system must be disabled to configure Cloud Tier storage.

Anytime you display the **File System** section when the File System has not been created, the system displays an error message. Continue with the procedure to create the file system.

Configure storage tier pages

The configure storage tier pages enable you to configure storage for each licensed tier on the system, Active Tier, Cache Tier, and Cloud Tier. Each tier has a separate wizard page. The storage tier configuration pages cannot be accessed through the wizard if the file system is already created.

Systems that use 8 TB disks require a certain number of disks installed in the disk shelves in order to configure Active Tier and Cloud Tier storage. The minimum disk requirements are:

 **Note:** Systems that are not listed in this table do not support 8 TB disks, and are not subject to this requirement.

System	Minimum disk packs required for Active Tier (number of disks)	Minimum disk packs required for Cloud Tier (number of disks)
DD6900	N/A	2 packs (30 disks)
DD9400	4 packs (60 disks)	4 packs (60 disks)
DD9900	8 packs (120 disks)	5 packs (75 disks)

Configure Active Tier

The Configure Active Tier section allows you to configure the Active Storage Tier devices. The Active Tier is where back up data resides. To add storage to the Active Tier, select one or more devices and add them to the tier. You can add storage devices up to the capacity licenses installed.

 **Note:** The DD3300 system requires 4 TB devices for the Active Tier.

Table 19 Addable Storage

Item	Description
ID (Device in DDVE)	The disk identifier, which can be any of the following. <ul style="list-style-type: none"> The enclosure and disk number (in the form Enclosure Slot, or Enclosure Pack for DS60 shelves) A device number for a logical device such as those used by DD VTL and vDisk A LUN
Disks	The disks that comprise the disk pack or LUN. This does not apply to DDVE instances.
Model	The type of disk shelf. This does not apply to DDVE instances.
Disk Count	The number of disks in the disk pack or LUN. This does not apply to DDVE instances.
Disk Size (Size in DDVE)	The data storage capacity of the disk. ^a
Failed Disks	Failed disks in the disk pack or LUN. This does not apply to DDVE instances.
Type	SCSI. This only applies to DDVE instances.

a. The DD OS convention for computing disk space defines one gibibyte as 2^{30} bytes, giving a different disk capacity than the manufacturer's rating.

Table 20 Active Tier values

Item	Description
ID (Device in DDVE)	The disk identifier, which can be any of the following. <ul style="list-style-type: none"> The enclosure and disk number (in the form Enclosure Slot, or Enclosure Pack for DS60 shelves). This does not apply to DDVE instances. A device number for a logical device such as those used by DD VTL and vDisk A LUN
Disks	The disks that comprise the disk pack or LUN. This does not apply to DDVE instances.
Model	The type of disk shelf. This does not apply to DDVE instances.
Disk Count	The number of disks in the disk pack or LUN. This does not apply to DDVE instances.
Disk Size (Size in DDVE)	The data storage capacity of the disk. ^a
Failed Disks	Failed disks in the disk pack or LUN. This does not apply to DDVE instances.
Configured	New or existing storage. This does not apply to DDVE instances.
Type	SCSI. This only applies to DDVE instances.

Table 20 Active Tier values (continued)

- a. The DD OS convention for computing disk space defines one gibibyte as 2^{30} bytes, giving a different disk capacity than the manufacturer's rating.

Configure Cache Tier

The Configure Cache Tier section allows you to configure the Cache Storage Tier devices. The Cache Tier is where metadata cached with the Metadata on Flash feature resides. To add storage to the Cache Tier, select one or more devices and add them to the tier. You can add storage devices up to the capacity licenses installed.


 **Note:** DD6900, DD9400, and DD9900 systems do not require a license for Cache Tier storage.

Table 21 Addable Storage

Item	Description
ID	The disk identifier, which can be any of the following. <ul style="list-style-type: none"> The enclosure and disk number (in the form Enclosure Slot, or Enclosure Pack for DS60 shelves) A device number for a logical device such as those used by DD VTL and vDisk A LUN
Disk Size (Size in DDVE)	The data storage capacity of the disk. ^a
Type	SAS-SSD

- a. The DD OS convention for computing disk space defines one gibibyte as 2^{30} bytes, giving a different disk capacity than the manufacturer's rating.

Table 22 Cache Tier values

Item	Description
ID	The disk identifier, which can be any of the following. <ul style="list-style-type: none"> The enclosure and disk number (in the form Enclosure Slot, or Enclosure Pack for DS60 shelves). This does not apply to DDVE instances. A device number for a logical device such as those used by DD VTL and vDisk A LUN
Disk Size (Size in DDVE)	The data storage capacity of the disk. ^a
Type	SAS-SSD
Configured	New or existing storage.

- a. The DD OS convention for computing disk space defines one gibibyte as 2^{30} bytes, giving a different disk capacity than the manufacturer's rating.

Configure Cloud Tier

The Configure Cloud Tier section allows you to configure the Cloud Storage Tier devices. To add storage to the Cloud Tier, select one or more devices and add them to the tier. You can add storage devices up to the capacity licenses installed.


 **Note:** The DD3300 system requires 1 TB devices for Cloud Tier.

Table 23 Addable Storage

Item	Description
ID (Device in DDVE)	The disk identifier, which can be any of the following. <ul style="list-style-type: none"> The enclosure and disk number (in the form Enclosure Slot, or Enclosure Pack for DS60 shelves) A device number for a logical device such as those used by DD VTL and vDisk A LUN
Disks	The disks that comprise the disk pack or LUN. This does not apply to DDVE instances.
Model	The type of disk shelf. This does not apply to DDVE instances.
Disk Count	The number of disks in the disk pack or LUN. This does not apply to DDVE instances.
Disk Size (Size in DDVE)	The data storage capacity of the disk. ^a
License Needed	The licensed capacity required to add the storage to the tier.
Failed Disks	Failed disks in the disk pack or LUN. This does not apply to DDVE instances.
Type	SCSI. This only applies to DDVE instances.

a. The DD OS convention for computing disk space defines one gibibyte as 2³⁰ bytes, giving a different disk capacity than the manufacturer's rating.

Table 24 Cloud Tier values

Item	Description
ID (Device in DDVE)	The disk identifier, which can be any of the following. <ul style="list-style-type: none"> The enclosure and disk number (in the form Enclosure Slot, or Enclosure Pack for DS60 shelves). This does not apply to DDVE instances. A device number for a logical device such as those used by DD VTL and vDisk A LUN
Disks	The disks that comprise the disk pack or LUN. This does not apply to DDVE instances.
Model	The type of disk shelf. This does not apply to DDVE instances.
Disk Count	The number of disks in the disk pack or LUN. This does not apply to DDVE instances.
Disk Size (Size in DDVE)	The data storage capacity of the disk. ^a
License Used	The licensed capacity consumed by the storage.
Failed Disks	Failed disks in the disk pack or LUN. This does not apply to DDVE instances.

Table 24 Cloud Tier values (continued)

Item	Description
Configured	New or existing storage. This does not apply to DDVE instances.
Type	SCSI. This only applies to DDVE instances.

- a. The DD OS convention for computing disk space defines one gibibyte as 2^{30} bytes, giving a different disk capacity than the manufacturer's rating.

Create File System page

The Create File System page displays the allowed size of each storage tier in the file system, and provides a setting to automatically enable the file system after it is created.

System Settings

The **System Settings** section enables you to configure system passwords and email settings. Click **Yes** to configure the system settings or click **No** to skip system settings configuration.

System Settings Administrator page

The Administrator page enables you to configure the administrator password and define how the system communicates with the administrator.

Table 25 Administrator page settings

Item	Description
User Name	The default administrator name is <i>sysadmin</i> . The sysadmin user cannot be renamed or deleted.
Old Password	Type the old password for sysadmin.
New Password	Type the new password for sysadmin.
Verify New Password	Retype the new password for sysadmin.
Admin Email	Specify the email address to which DD System Manager sends alert and autosupport email messages.
Send Alert Notification Emails to this address	Check to configure DD System Manager to send alert notifications to the Admin email address as alert events occur.
Send Daily Alert Summary Emails to this address	Check to configure DD System Manager to send alert summaries to the Admin email address at the end of each day.
Send Autosupport Emails to this address	Check to configure DD System Manager to send the Admin user autosupport emails, which are daily reports that document system activity and status.

System Settings Email/Location page

The Email/Location page enables you to configure the mail server name, control what system information is sent to Dell EMC, and specify a location name to identify your system.

Table 26 Email/Location page settings

Item	Description
Mail Server	Specify the name of the mail server that manages emails to and from the system.
Credentials	Select whether or not to require credentials for the mail server.
User Name	If credentials are enabled, specify the mail server username.
Password	If credentials are enabled, specify the mail server password.
Send Alert Notification Emails to Dell EMC	Check to configure DD System Manager to send alert notification emails to Dell EMC.
Send Vendor Support Notification Emails to Dell EMC	Check to configure DD System Manager to send vendor support notification emails to Dell EMC.
Location	Use this optional attribute to record the location of your system. If you specify a location, this information is stored as the SNMP system location.

DD Boost protocol

The **DD Boost** settings section enables you to configure the DD Boost protocol settings. Click **Yes** to configure the DD Boost Protocol settings, or click **No** to skip DD Boost configuration.

DD Boost Protocol Storage Unit page

The Storage Unit page enables you to configure DD Boost storage units.

To configure these settings outside of the configuration wizard, select **Protocols > DD Boost > Storage Units > + (plus sign)** to add a storage unit, **the pencil** to modify a storage unit, or **X** to delete a storage unit.

Table 27 Storage Unit page settings

Item	Description
Storage Unit	The name of your DD Boost Storage Unit. You may optionally change this name.
User	For the default DD Boost user, either select an existing user, or select Create a new Local User, and enter their User name, Password, and Management Role. This role can be one of the following: <ul style="list-style-type: none"> <i>Admin role:</i> Lets you configure and monitor the entire protection system.

Table 27 Storage Unit page settings (continued)

Item	Description
	<ul style="list-style-type: none"> • <i>User role:</i> Lets you monitor systems and change your own password. • <i>Security role:</i> In addition to user role privileges, lets you set up security-officer configurations and manage other security-officer operators. • <i>Backup-operator role:</i> In addition to user role privileges, lets you create snapshots, import and export tapes to, or move tapes within a DD VTL. • <i>None role:</i> Intended only for DD Boost authentication, so you cannot monitor or configure a system. None is also the parent role for the SMT tenant-admin and tenant-user roles. None is also the preferred user type for DD Boost storage owners. Creating a new local user here only allows that user to have the "none" role.

DD Boost Protocol Fibre Channel page

The Fibre Channel page enables you to configure DD Boost Access Groups over Fibre Channel.

To configure these settings outside of the configuration wizard, select **Protocols > DD Boost > Fibre Channel > + (plus sign)** to add an access group, **the pencil** to modify an access group, or **X** to delete an access group.

Table 28 Fibre Channel page settings

Item	Description
Configure DD Boost over Fibre Channel	Select the checkbox if you want to configure DD Boost over Fibre Channel.
Group Name (1-128 Chars)	Create an Access Group. Enter a unique name. Duplicate access groups are not supported.
Initiators	Select one or more initiators. Optionally, replace the initiator name by entering a new one. An initiator is a backup client that connects to the system to read and write data using the FC (Fibre Channel) protocol. A specific initiator can support DD Boost over FC or DD VTL, but not both.
Devices	The devices to be used are listed. They are available on all endpoints. An endpoint is the logical target on the Data Domain or PowerProtect system to which the initiator connects.

CIFS protocol

The **CIFS Protocol** settings section enables you to configure the CIFS protocol settings. Click **Yes** to configure the CIFS protocol settings, or click **No** to skip CIFS configuration.

The system uses the term MTree to describe directories. When you configure a directory path, DD OS creates an MTree where the data will reside.

CIFS Protocol Authentication page

The Authentication page enables you to configure Active Directory and Workgroup for your system.

To configure these settings outside of the configuration wizard, select **Administration > Access > Authentication**.

Table 29 Authentication page settings

Item	Description
Active Directory/Kerberos Authentication	Expand this panel to enable, disable, and configure Active Directory Kerberos authentication.
Workgroup Authentication	Expand this panel to configure Workgroup authentication.
LDAP Authentication	Expand this panel to configure LDAP authentication.
NIS Authentication	Expand this panel to configure NIS authentication.

CIFS Protocol Share page

The Share page enables you to configure a CIFS protocol share name and a directory path for your system.

To configure these settings outside of the configuration wizard, select **Protocols > CIFS > Shares > Create**.

Table 30 Share page settings

Item	Description
Share Name	Enter a share name for the system.
Directory Path	Enter a directory path for the system.
Add (+) button	Click + to enter a system client, user, or group.
Pencil icon	Modify a client, user, or group.
Delete (X) button	Click X to delete a selected client, user, or group.

NFS protocol

The **NFS Protocol** settings section enables you to configure the NFS protocol settings. Click **Yes** to configure the NFS protocol settings, or click **No** to skip NFS configuration.

The system uses the term MTree to describe directories. When you configure a directory path, DD OS creates an MTree where the data will reside.

NFS Protocol Export page

The Export page enables you to configure an NFS protocol export directory path, network clients, and NFSv4 referrals.

To configure these settings outside of the configuration wizard, select **Protocols > NFS > Create**.

Table 31 Export page settings

Item	Description
Directory Path	Enter a pathname for the export.
Add (+) button	Click + to enter a system client or NFSv4 referral.
Pencil icon	Modify a client or NFSv4 referral.
Delete (X) button	Click X to delete a selected client or NFSv4 referral.

DD VTL protocol

The **DD VTL Protocol** settings section enables you to configure the DD Virtual Tape Library settings. Click **Yes** to configure the DD VTL settings, or click **No** to skip DD VTL configuration.

VTL Protocol Library page

The Library page enables you to configure the DD VTL protocol settings for a library.

To configure these settings outside of the configuration wizard, select **PROTOCOLS > VTL > Virtual Tape Libraries > VTL Service > Libraries > More Tasks > Library > Create**

Table 32 Library page settings

Item	Description
Library Name	Enter a name of from 1 to 32 alphanumeric characters.
Number of Drives	Number of supported tape drives.
Drive Model	Select the desired model from the drop-down list: <ul style="list-style-type: none"> • IBM-LTO-1 • IBM-LTO-2 • IBM-LTO-3 • IBM-LTO-4 • IBM-LTO-5 (default) • HP-LTO-3 • HP-LTO-4
Number of Slots	Enter the number of slots per library: <ul style="list-style-type: none"> • Up to 32,000 slots per library • Up to 64,000 slots per system • This should be equal to, or greater than, the number of drives.
Number of CAPs	(Optional) Enter the number of cartridge access ports (CAPs): <ul style="list-style-type: none"> • Up to 100 CAPs per library • Up to 1000 CAPs per system
Changer Model Name	Select the desired model from the drop-down list: <ul style="list-style-type: none"> • L180 (default) • RESTORER-L180

Table 32 Library page settings (continued)

Item	Description
	<ul style="list-style-type: none"> • TS3500 • I2000 • I6000 • DDVTL
Starting Barcode	Enter the desired barcode for the first tape, in the format A990000LA.
Tape Capacity	(Optional) Enter the tape capacity. If not specified, the capacity is derived from the last character of the barcode.

VTL Protocol Access Group page

The Access Group page enables you to configure DD VTL protocol settings for an access group.

To configure these settings outside of the configuration wizard, select **PROTOCOLS > VTL > Access Groups > Groups > More Tasks > Group > Create**.

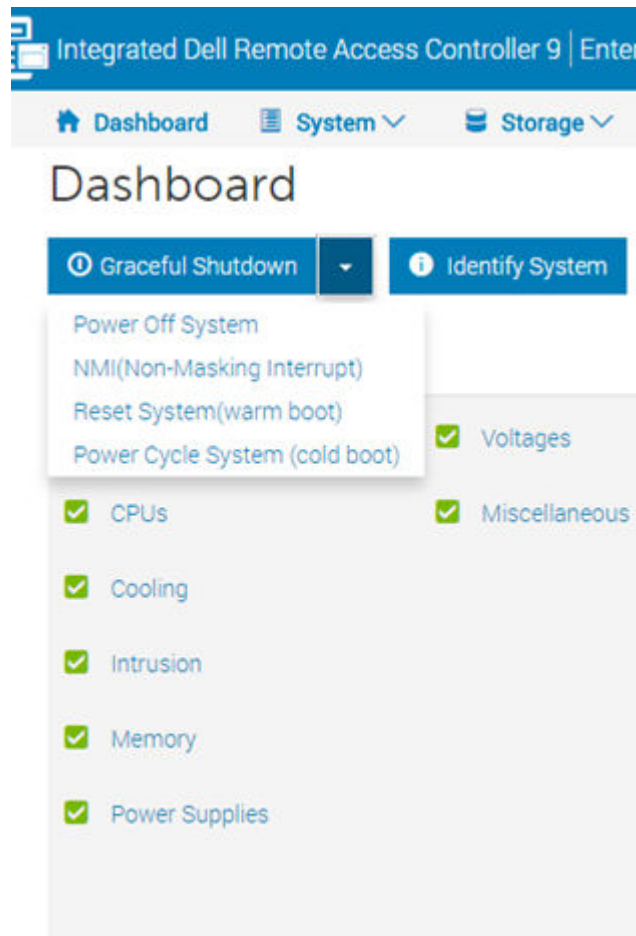
Table 33 Access Group page settings

Item	Description
Group Name	Enter a unique name of from 1 - 128 characters. Duplicate access groups are not supported.
Initiators	Select one or more initiators. Optionally, replace the initiator name by entering a new one. An initiator is a backup client that connects to a system to read and write data using the Fibre Channel (FC) protocol. A specific initiator can support DD Boost over FC or DD VTL, but not both.
Devices	The devices (drives and changer) to be used are listed. These are available on all endpoints. An endpoint is the logical target on the protection system to which the initiator connects.

Use iDRAC to power the system on and off remotely

Procedure

1. In a web browser, type the iDRAC IP address specified during iDRAC configuration.
2. Login with the user name root. The default password is the system serial number on the PSNT.
3. Select **Dashboard**.
4. Click **Graceful Shutdown** to initiate the same behavior as pressing the power button, or select the drop-down arrow to select one of the following options:
 - **Power Off System**
 - **Reset System (warm boot)**
 - **Power Cycle System (cold boot)**

Figure 66 iDRAC power options

Configure HA

Before you begin

- The HA interconnect between both nodes is connected.
 ⓘ **Note:** [Connecting the HA interconnect](#) on page 66 describes how to cable the HA interconnect.
- The data connections on both nodes are connected.

About this task

Configure the two nodes as an HA pair.

- ⓘ **Note:** Configuring an HA pair sets the system password on the standby node to match the system password on the active node, however, that synchronization is not set until the HA configuration is complete. If the HA configuration fails, or if there is a need to access either node before the HA configuration is complete, use the serial number of each node as the password.

Procedure

1. Verify the certificate subject name on the primary node.

Run the following command:

```
adminaccess certificate show
```

```
sysadmin@dd9900-ha3a# adminaccess certificate show
Subject                               Type      Application  Valid From                               Valid
Until
-----
dd-ha3a.example.com                 host      https        Tue Aug  8 14:11:28 2018             Sat Aug  7
21:11:28 2022
dd-ha3a.example.com                 ca        trusted-ca   Tue Aug  8 21:04:53 2018             Mon Aug  7
21:04:53 2024
-----
```

2. Verify the certificate subject name on the standby node.

Run the following command:

```
adminaccess certificate show
```

```
sysadmin@dd9900-ha3b# adminaccess certificate show
Subject                               Type      Application  Valid From                               Valid Until
-----
dd-ha3b.example.com                 host      https        Tue Aug  8 15:11:28 2018             Sat Aug  7
22:11:28 2022
dd-ha3b.example.com                 ca        trusted-ca   Tue Aug  8 22:04:53 2018             Mon Aug  7
22:04:53 2024
-----
```

3. Complete one of the following options:

- If the values in the `Subject` column on both nodes are different, continue to Step 4.
- If the values in the `Subject` column on both nodes are the same:
 - a. Change the hostname of the standby node.
 - b. Run the `adminaccess certificate generate self-signed-cert regenerate-ca` command on the standby node to generate new certificates with the new hostname.
 - c. Proceed to Step 4.

4. Set the system time on both nodes. The HA configuration will fail if the time on the two nodes is more than 10 seconds apart.

Run the following command:

```
system set date MMDDhhmm [[CC] YY]
```

Note: After HA configuration is complete, point both nodes to an NTP or Active Directory time server.

5. Turn off DHCP for each port used for the HA interconnect on both nodes.

HA interconnect ports
ethMb, ethMc, ethMd

Run the following command:

```
net config <HA-interconnect-port> dhcp off
```

6. On the primary node, create the HA pairing.

Note:

- Specify the hostname or the IP address of the standby node.

- The `ha create` command will fail if one node is configured to use DHCP and the other node is configured to use static IP addresses. Both nodes must use the same method to configure IP addresses.

Run the following command:

```
ha create peer {<ipaddr> | <hostname>} [ha-name <ha-system-name>]
```

Note: If no value is specified for the optional `ha-name` parameter, the `ha create` command promotes the primary node hostname to be the HA system name.

```
ha create peer mysystem-pl.emc.com
```

This command:

- Reboots both nodes, and completes the HA pairing when the nodes come back online.
 - Assigns node 0 the local hostname `<HA-system-name>-p0`.
 - Assigns node 1 the local hostname `<HA-system-name>-p1`.
7. When both nodes are up, verify the following information matches on both nodes:
 - Hardware model
 - Software version

8. Check the system for alerts.

Run the following command:

```
alerts show current
```

If the system displays `System is misconfigured, the SSDs were not removed from the front of the primary node`. Run the `enclosure show misconfiguration` command to get more details.

9. Verify the HA status

Run the following command:

```
ha status
```

```
HA System Name: dd9900-ha3a.emc.com
HA System Status: highly available
```

Node Name	Node ID	Role	HA State
dd9900-ha3a-p0.example.com	0	active	online
dd9900-ha3a-p1.example.com	1	standby	online

10. On node 0, convert all data IP addresses to floating IP addresses.

Run the following command for each IP address that needs to be converted to a floating IP address:

```
net config <interface-name> <IP address> netmask <netmask> type floating
```

Note: The `net config` command with the `float` option is the only way to configure a floating IP address. There is no method available in DD System Manager to configure a floating IP address.

```
# net config eth1a 2.2.2.1 netmask 255.255.255.0 type floating
```

11. Add the SSD enclosure to cache tier.

Run the following command:

```
storage add tier cache enclosure
```

<enclosure number>

12. Enable the filesystem on node 0.

Run the following command:

```
filesys enable
```

