SC460 Expansion Enclosure

Owner's Manual

DELLEMC

Notes, Cautions, and Warnings

ⓘ | **NOTE: A NOTE indicates important information that helps you make better use of your product.**

⚠ | **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

⚠ | **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

Contents

About this Guide

This guide describes how to perform service and maintenance on the SC460 expansion enclosure.

Revision History

Document Number: 680-140-001

Revision	Date	Description
A	October 2017	Initial release
B	November 2017	Moved cable management tray installation before expansion enclosure installation
C	August 2018	New expansion enclosure rack rails
D	October 2018	Updated configuration information

Audience

The information provided in this guide is intended for use by Dell end users.

Contacting Dell

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

To contact Dell for sales, technical support, or customer service issues, go to www.dell.com/support.

- For customized support, type your system service tag on the support page and click **Submit**.
- For general support, browse the product list on the support page and select your product.

Related Publications

The following documentation is available for the SC460 expansion enclosure.

- *SC460 Expansion Enclosure Getting Started Guide*

  Provides information about an SC460 expansion enclosure, such as installation instructions and technical specifications.
- *Storage Center Release Notes*

  Provides information about new features and known and resolved issues for the Storage Center software.
- *Storage Center Update Utility Administrator's Guide*

  Describes how to use the Storage Center Update Utility to install Storage Center software updates. Updating Storage Center software using the Storage Center Update Utility is intended for use only by sites that cannot update Storage Center using standard methods.
- *Storage Center Software Update Guide*

  Describes how to update Storage Center software from an earlier version to the current version.
- *Storage Center Command Utility Reference Guide*

  Provides instructions for using the Storage Center Command Utility. The Command Utility provides a command-line interface (CLI) to enable management of Storage Center functionality on Windows, Linux, Solaris, and AIX platforms.
- *Storage Center Command Set for Windows PowerShell*

Provides instructions for getting started with Windows PowerShell cmdlets and scripting objects that interact with the Storage Center using the PowerShell interactive shell, scripts, and PowerShell hosting applications. Help for individual cmdlets is available online.

- *Storage Manager Administrator's Guide*

  Provides instructions for using the Storage Manager software.

- *Dell TechCenter*

  Provides technical white papers, best practice guides, and frequently asked questions about Dell Storage products. Go to http://en.community.dell.com/techcenter/storage/.

About the SC460 Expansion Enclosure

An SC460 expansion enclosure provides expansion storage for a Storage Center.

The SC460 expansion enclosure connects directly to the SAS ports on the back of the storage system.

Topics:

SC460 Expansion Enclosure Overview

The SC460 is a 4U SAS expansion enclosure that supports up to 60 3.5-inch 12 Gbps hard drives.

The SC460 expansion enclosure ships with two redundant power supplies and two redundant enclosure management modules (EMMs).

SC460 Expansion Enclosure Front Panel Features and Indicators

The SC460 front panel shows the expansion enclosure status and power supply status.

Figure 1. SC460 Front-Panel Features and Indicators

Item	Name	Description
1	Power LED	The power LED lights when at least one power supply unit is supplying power to the expansion enclosure.
2	Expansion enclosure status LED	- Solid blue during normal operation. - Blinks blue when an Indicator On command is sent from the Storage Center or when the system identification button is pressed.

SC460 Expansion Enclosure Back Panel Features and Indicators

The SC460 back panel provides controls to power up and reset the expansion enclosure, indicators to show the expansion enclosure status, and connections for back-end cabling.
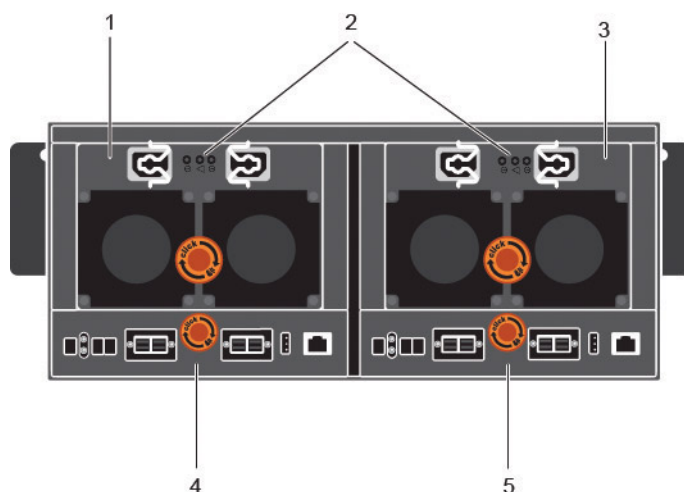
Figure 2. SC460 Back Panel Features and Indicators

Item	Name	Description
1	Power supply unit and cooling fan module (PS1)	Contains redundant 900 W power supplies and fans that provide cooling for the expansion enclosure.
2	Power supply indicators • AC power indicator for power supply 1 • Power supply/cooling fan indicator • AC power indicator for power supply 2	AC power indicators: • Green – Normal operation. The power supply module is supplying AC power to the expansion enclosure • Off – Power switch is off, the power supply is not connected to AC power, or has a fault condition • Flashing Green – AC power is applied, but is out of spec. Power supply/cooling fan indicator: • Amber – Power supply/cooling fan fault is detected • Off – Normal operation
3	Power supply unit and cooling fan module (PS2)	Contains redundant 900 W power supplies and fans that provide cooling for the expansion enclosure.
4	Enclosure management module 1	EMMs provide the data path and management functions for the expansion enclosure.
5	Enclosure management module 2	EMMs provide the data path and management functions for the expansion enclosure.

SC460 Expansion Enclosure Drives

Dell Enterprise Plus drives are the only drives that can be installed in SC460 expansion enclosures. If a non-Dell Enterprise Plus drive is installed, the Storage Center prevents the drive from being managed.

The drives in an SC460 expansion enclosure are installed horizontally.
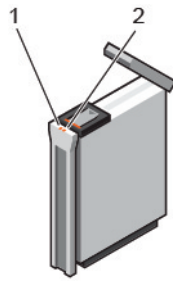
Figure 3. SC460 Drive Indicators

Item	Name	Description
1	Drive activity indicator	• Blinking blue – Drive activity • Steady blue – Drive is detected and has no faults
2	Drive status indicator	• Off – Normal operation • Blinking amber (on 1 sec. / off 1 sec.) – Drive identification is enabled • Steady amber – Drive has a fault

SC460 Expansion Enclosure Drive Numbering

The Storage Center identifies drives as XX–YY, where XX is the unit ID of the expansion enclosure that contains the drive, and YY is the drive position inside the expansion enclosure.

An SC460 holds up to 60 drives, which are numbered from left to right in rows starting from 0.

Figure 4. SC460 Drive Numbering

SC460 Expansion Enclosure Installation

This chapter describes how to install an SC460 expansion enclosure.

Safety Precautions

Always follow these safety precautions to avoid injury and damage to Storage Center equipment.

If equipment described in this guide is used in a manner not specified by Dell, the protection provided by the equipment could be impaired. For your safety and protection, observe the rules described in the following sections.

ⓘ **NOTE: See the safety and regulatory information that shipped with each Storage Center component. Warranty information is included as a separate document.**
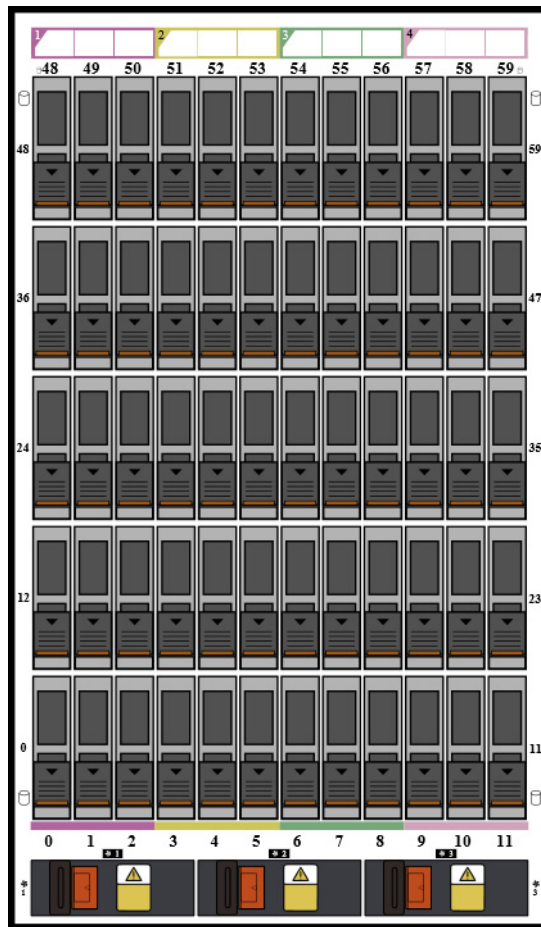
Installation Safety Precautions

Follow these safety precautions when installing an SC460 expansion enclosure:

Caution

Equipment exceeds 90 kg (200 lb). Use appropriate lifting methods when installing an SC460 expansion enclosure.

- You can install the expansion enclosure chassis without using a mechanical lift if you remove the drives, cooling fans, power supply units (PSUs), and enclosure management modules (EMMs) from the chassis before installing it.

  You must use a mechanical lift to install the expansion enclosure chassis if you do not remove the drives, cooling fans, PSUs, and EMMs from the chassis.

- Dell recommends that only individuals with rack-mounting experience install an SC460 expansion enclosure in a rack.
- When installing multiple expansion enclosures in a rack, fill the rack from the bottom up and empty the rack from the top down.
- The rack construction must support the total weight of the installed expansion enclosures. The design should incorporate stabilizing features suitable to prevent the rack from tipping or being pushed over during installation or in normal use.
- To prevent the rack from tipping, slide only one expansion enclosure out of the rack at a time.
- Make sure that the expansion enclosure is always fully grounded to prevent damage from electrostatic discharge.
- When handling the expansion enclosure components, use an electrostatic wrist guard or a similar form of protection.

Electrical Safety Precautions

Always follow electrical safety precautions to avoid injury and damage to Storage Center equipment.

⚠ **WARNING: Disconnect power from the expansion enclosure when removing or installing components that are not hot-swappable. When disconnecting power, first power down the storage system using the storage client and then unplug the power cords from the power supplies in the storage system and expansion enclosure.**

- Provide a suitable power source with electrical overload protection. All Storage Center components must be grounded before applying power. Make sure that a safe electrical earth connection can be made to power supply cords. Check the grounding before applying power.
- The plugs on the power supply cords are used as the main disconnect device. Make sure that the socket outlets are located near the equipment and are easily accessible.
- Know the locations of the equipment power switches and the room's emergency power-off switch, disconnection switch, or electrical outlet.
- Do not work alone when working with high-voltage components.
- Use rubber mats specifically designed as electrical insulators.
- Do not remove covers from the power supply unit. Disconnect the power connection before removing a power supply from the expansion enclosure.
- Do not remove a faulty power supply unless you have a replacement model of the correct type ready for insertion.
- Unplug the expansion enclosure chassis before you move it or if you think it has become damaged in any way. When powered by multiple AC sources, disconnect all power sources for complete isolation.

Electrostatic Discharge Precautions

Always follow electrostatic discharge (ESD) precautions to avoid injury and damage to Storage Center equipment.

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. The resulting electrical discharge can damage electronic components and printed circuit boards. Follow these guidelines to protect your equipment from ESD:

- Dell recommends that you always use a static mat and static strap while working on components in the interior of the chassis.
- Observe all conventional ESD precautions when handling plug-in modules and components.
- Use a suitable ESD wrist or ankle strap.
- Avoid contact with backplane components and module connectors.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

General Safety Precautions

Always follow general safety precautions to avoid injury and damage to Storage Center equipment.

- Keep the area around the expansion enclosure chassis clean and free of clutter.
- Place any system components that have been removed away from the expansion enclosure chassis or on a table so that they are not in the way of other people.
- While working on the expansion enclosure chassis, do not wear loose clothing such as neckties and unbuttoned shirt sleeves. These items can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body. These items are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- Do not lift the expansion enclosure chassis by the handles of the power supply units (PSUs). They are not designed to hold the weight of the entire chassis, and the chassis cover could become bent.
- Before moving the expansion enclosure chassis, remove the PSUs to minimize weight.
- Do not remove drives until you are ready to replace them.

(i) **NOTE: To ensure proper expansion enclosure cooling, hard drive blanks must be installed in any hard drive slot that is not occupied.**

Unpacking Storage Center Equipment

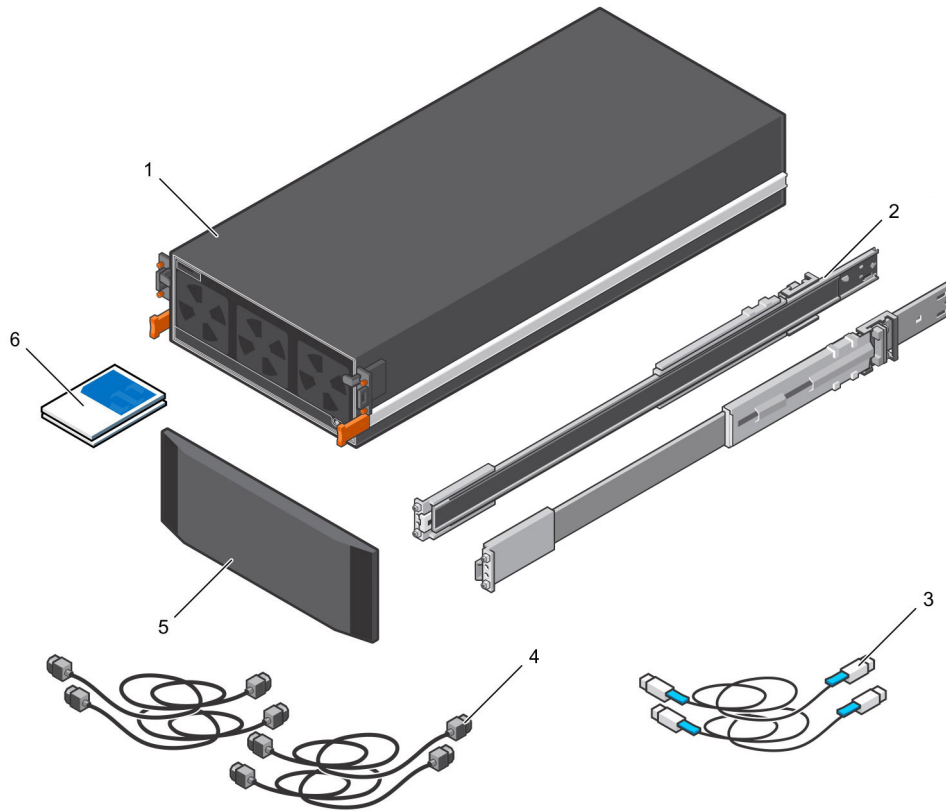Unpack the expansion enclosure and identify the items in your shipment.

Figure 5. Expansion Enclosure Components

1	Expansion enclosure	2	Rack rails (2)
3	Mini-SAS HD cables (2)	4	Power cables (4)
5	Front bezel (Optional)	6	Documentation

Determine the Mounting Location

Determine where to mount the SC460 expansion enclosure in the rack.

1   Identify a location in the rack with 4U of space for the expansion enclosure.

   ⚠ | **WARNING: If you plan to install the expansion enclosure above the lower 20U of a rack, use a mechanical lift to avoid injury.**

2   If you plan to install the 1U cable management tray below the expansion enclosure, identify a location in the rack with 5U of space for the expansion enclosure and cable management tray.
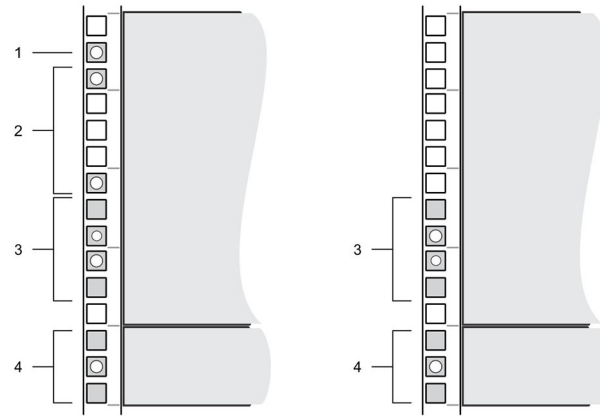
Figure 6. Mounting Location from Front and Back of Rack

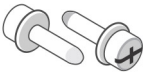| 1	Location for the clip nuts to secure the top cover	2	Location for the clip nuts to secure the expansion enclosure
3	Location for the expansion enclosure rack rails	4	Location for the 1U cable management tray rails

Install the Cable Management Tray

If you plan to use the 1U cable management tray, install the tray before installing the SC460 expansion enclosure.

Prerequisite

Identify the hardware that is used to install the 1U cable management tray in a rack .

Table 1. Identify the Hardware

Part	Part Number	Description
Screwdriver	034-000-193	6-in-1 screwdriver (Quantity: 1)
Left rail	042-034-012	Left rail for the cable management tray (Quantity: 1)
Right rail	042-034-008	Right rail for the cable management tray (Quantity: 1)
Cable management tray	042-033-060	1U cable management tray (Quantity: 1)
Cable management chain	150-000-168	Chains for managing cables (Quantity: 2)
Chassis bracket	043-043-023	Bracket that secures the cable management chains to the chassis (Quantity: 1)
Front bezel	100-563-123	Bezel for the front of the cable management tray (Quantity: 1)
	036-034-012	#8-32 x 3/4 in. Phillips screw (Quantity: 5) Used to secure the cable management tray rails to a rack, regardless of the rack type
Optional		
	036-034-003	Square hole alignment pin (Quantity: 9) Replacement alignment pin used to mount tray rails in racks that have 0.375 in. square holes
	036-034-004	Threaded hole alignment pin (Quantity: 9) Replacement alignment pin used to mount tray rails in racks that have threaded holes

About this task

Install the 1U cable management tray into a rack with a depth of 1070 mm (42.1 in.).

Steps

1 The 1U cable management tray rails are shipped with alignment pins that are designed to fit into a standard rack.

   To install the rails in a non-standard rack, remove the alignment pins from the rails and install the appropriate square hole or threaded hole alignment pins.

   a   Using a flat-head screwdriver, remove the alignment pins from the front and back of the rails.
   b   Identify the appropriate alignment pins (square hole or threaded hole) to use in the non-standard rack
   c   Install the appropriate alignment pins onto front and back of the rails.

2 Align the rails so that the UP arrow is pointed in the correct direction and the side of the rail labeled FRONT is at the front of the rack.

3 Insert the alignment pins of left and right rails into the mounting holes at the front and back of the rack.

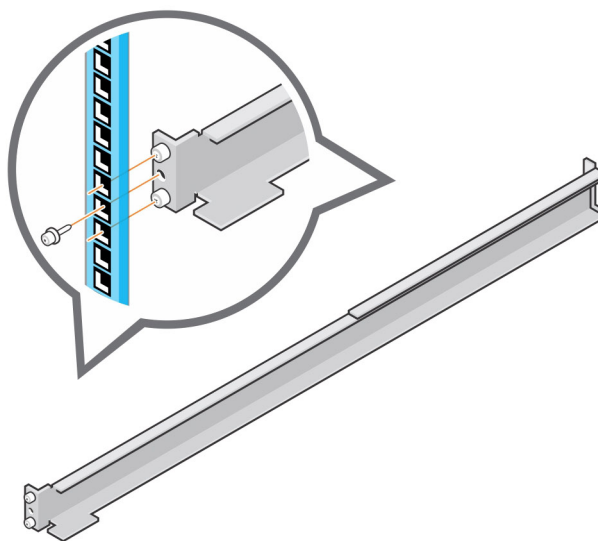4 Secure the rails by installing 8-32 x 0.75 in. screws into the holes at the front and back of the rails.

Figure 7. Secure Rails to Rack

5 Align the 1U cable management tray so that the UP arrow is pointed in the correct direction and the side of the tray labeled FRONT is to the front of the rack.
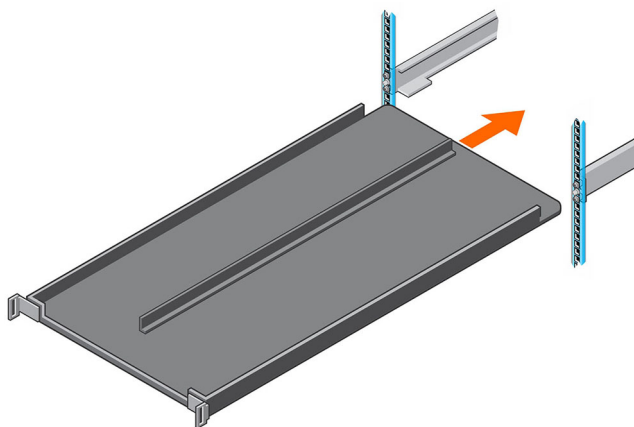

Figure 8. Align the Cable Management Tray

6 Slide the 1U cable management tray into the rails until it locks into place.

7   Prepare the cable chains and route the cables through the cable chains.

> ⓘ NOTE: **Label the cables before routing them through the cable chains.**

    a   Align the cable chains so the latches are facing up and the hinges are all facing each other.

    b   Unclip and open the all of the latches on the cable chains.
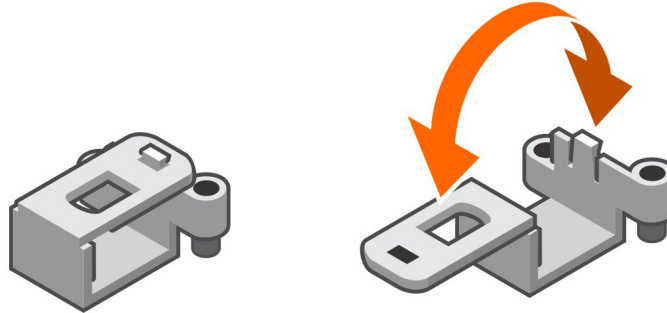
Figure 9. Open the Cable Chain Latches

    c   Route two power cables and two Mini-SAS HD cables through each cable chain.

    d   Close the latches and make sure that they are snapped shut.

    e   Arrange the cable chains to form a "U" shape with the latches facing up.

    f   Insert the cable chains through the back side of the tray.
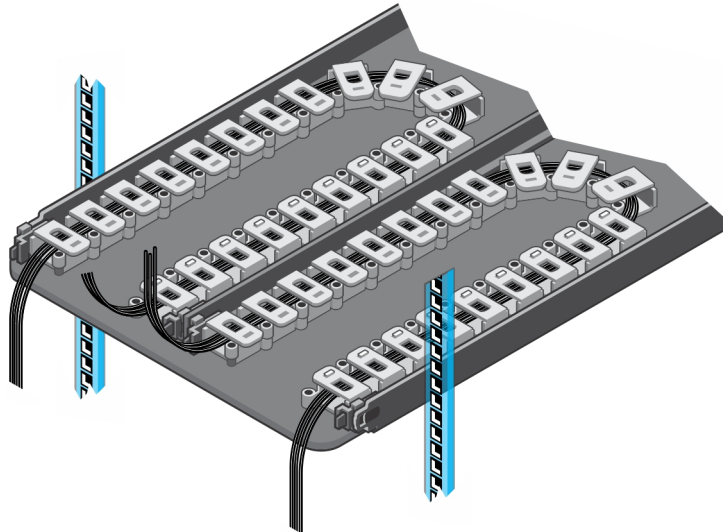
Figure 10. Position the Cable Chains

8   Attach the clips on the cable chains to the tabs on the back of the 1U cable management rails.
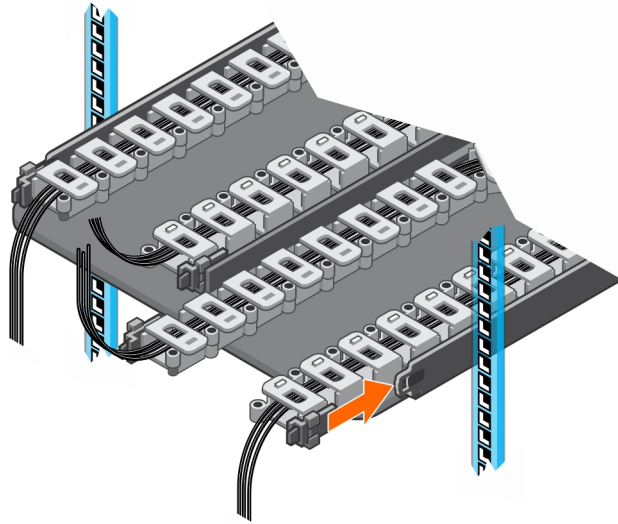
Figure 11. Attach Cable Chains to Tray Rails

9   Install the chassis bracket into the brackets on the side of the chassis.
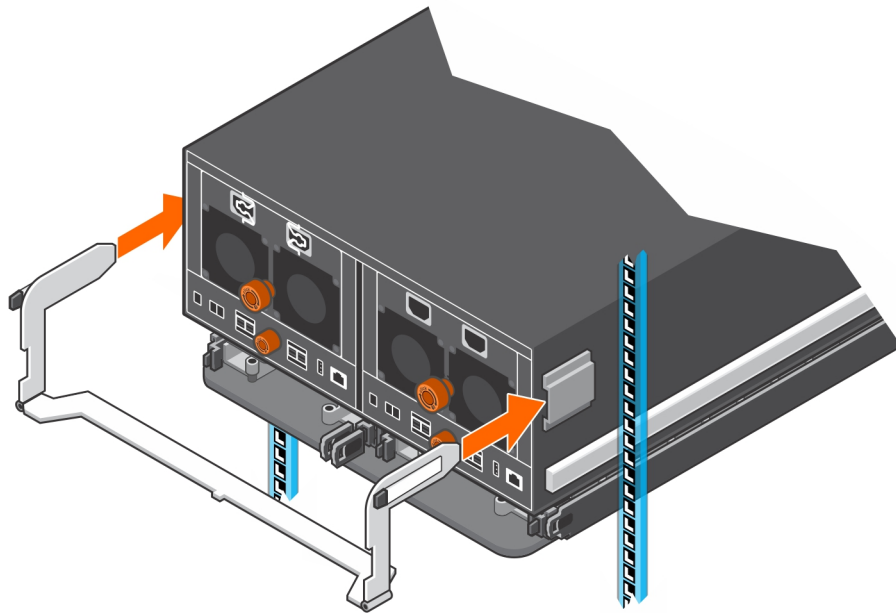

Figure 12. Install the Chassis Bracket to the Chassis

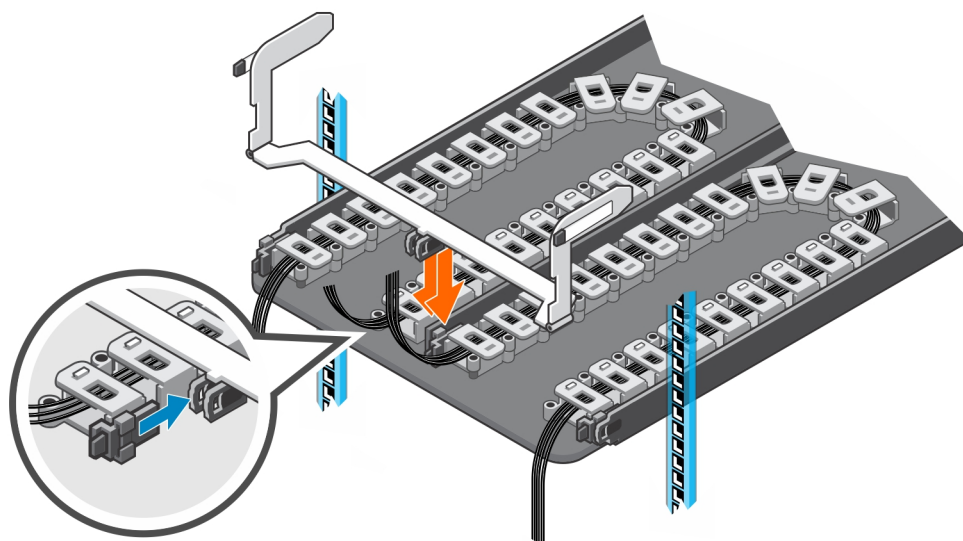10 Attach the clips on free end of the cable chains to the center flange on the chassis bracket.

Figure 13. Clip Cable Chains to Chassis Bracket

11 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.
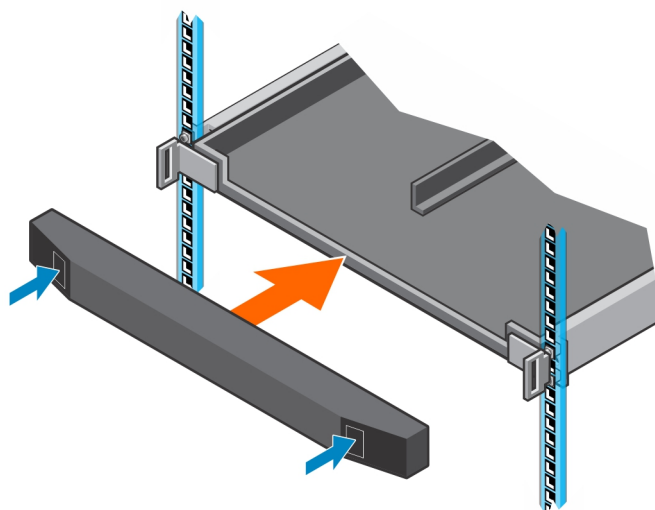
Figure 14. Install the Front Bezel

Modify the Rail Lengths

Use this procedure to extended or shorten the lengths of the expansion enclosure rails.

About this task

The rails have four adjustment ranges: 18-22", 22-26", 26-30", 30-34". The default length of the rails is 22-26".

Steps

1 Orient one of the rails to display the spacing markings on the inside of the rail.

2 Locate the two screws and nuts which hold the length adjustment bracket in place.

3 Using a screwdriver and a 10 mm socket or wrench, remove both screws and nuts.

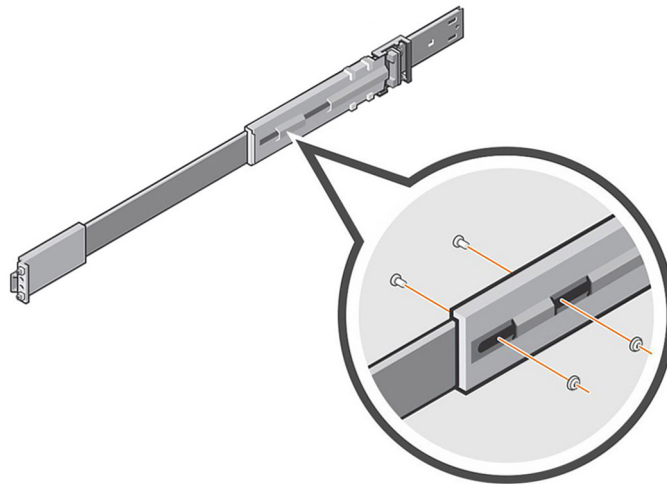The length adjustment bracket will be free of the rail.

Figure 15. Remove Screws and Nuts

4 Move to the front of the rail and align the mounting slots with the mounting holes.

5 Slide the inner rail mechanism until the 18"-22", 26"-30", or 30"-34" mark is visible.

  If the inner mechanism is locked, depress the leaf spring and press the rail locking mechanism to free it.

6 Adjust the hardware to make sure that the mounting holes are aligned with the mounting slots.

7 Secure the length adjustment bracket in place using both screws and nuts that were removed earlier.
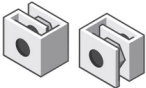
8 Repeat the previous steps for the other rail.

Install the Expansion Enclosure in a Standard Rack

Install the rails in the rack, and mount the SC460 expansion enclosure on the rails.

Prerequisite

Identify the hardware that is used to install the expansion enclosure in a standard rack .

Table 2. Identify the Hardware

Part	Part Number	Description
Screwdriver	034-000-193	6-in-1 screwdriver (Quantity: 1)
	042-013-076	Expansion enclosure chassis handle (Quantity: 4) Used to lift the expansion enclosure chassis onto a mechanical lift and mount it in a rack
	106-569-307	M5-0.8 clip nut (Quantity: 6) Used to secure the expansion enclosure chassis and top cover to a rack that does not have threaded holes

Steps

1 If necessary, adjust the length of the expansion enclosure rails to fit the rack.

2 Attach the right rail to the back post of the rack.

  a Align the right rail with the lower two U spaces of the 4U mounting location.

  b With the release latch on the outer part of the rack post, place the catch mechanism over the post.

    c   Push the rail back to secure the rail to the rack post.

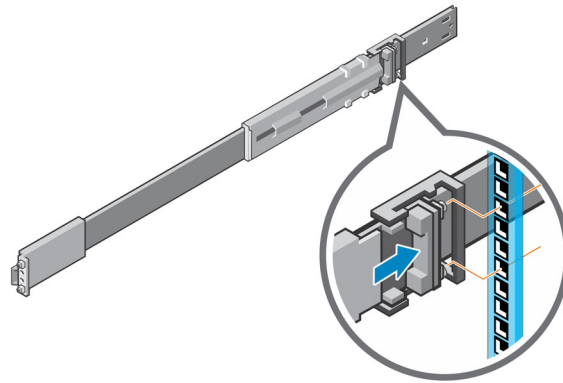   An audible click indicates that the rail is secure in the post.

3   Attach the right rail to the front post of the rack.

    a   Align the right rail with the lower two U spaces of the 4U mounting location.

    b   Pull the rail forward, with the alignment pins in the middle holes of the bottom two U spaces of the 4U mounting location.

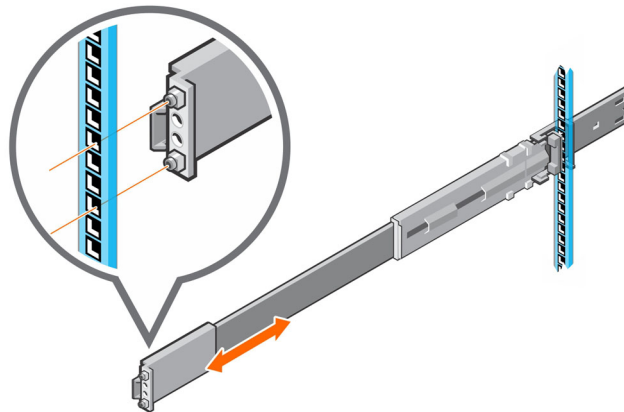   An audible click indicates that the rail is secure in the post.

Figure 17. Attach Rail to the Front of the Rack

4   Repeat the previous steps to install the left rail.

5   Mount the expansion enclosure chassis on the rails.

    a   If a mechanical lift is available, use the four handles (036-034-003) that shipped with the expansion enclosure to lift the expansion enclosure chassis onto a mechanical lift using the chassis handles.

    b   If a mechanical lift is not available, remove the drives, cooling fans, power supply units (PSUs), and enclosure management modules (EMMs) from the expansion enclosure chassis, and then lift the chassis to the mounting location using the chassis handles.

    c   From the front of the rack, extend the rails approximately 5 to 8 cm (2 to 3 in.) and align the expansion enclosure chassis rails with the extended rails.
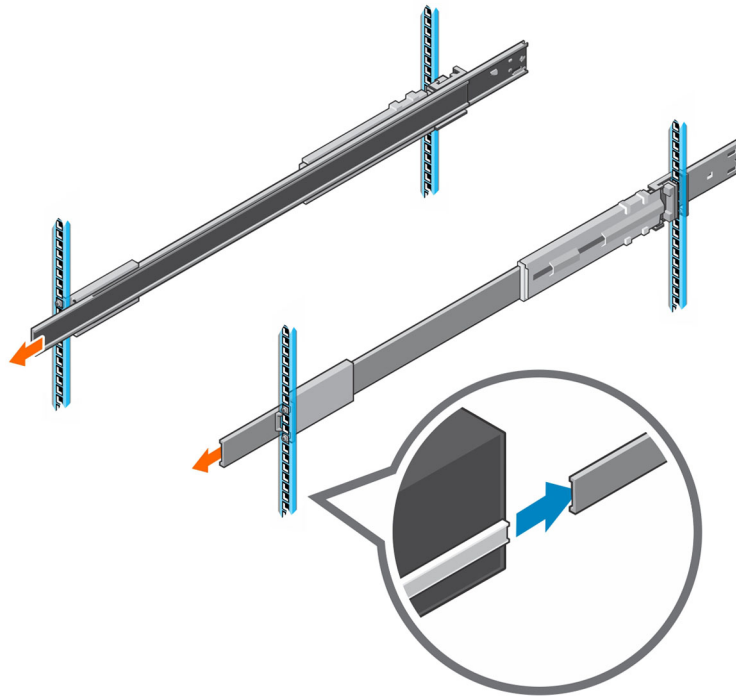
Figure 18. Extend the Rails from the Rack

    d   Slide the extended rails over the expansion enclosure chassis rails.

    e   Remove the four handles from the sides of the expansion enclosure chassis.

    f   Slide the expansion enclosure chassis into the rack.
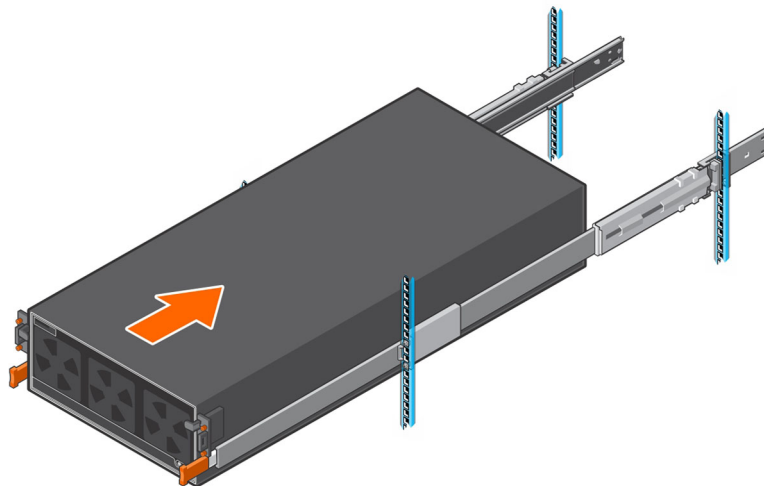
Figure 19. Mount the Expansion Enclosure into the Rack

6   If the drives, fans, PSUs, and EMMs were removed from the expansion enclosure chassis, reinstall these components in the chassis.

7   Secure the expansion enclosure chassis and top cover.

    a   Install the six clip nuts (106-569-307) into the rack holes that align with the shoulder screws on the front of the expansion enclosure chassis.

    b   Use the orange enclosure latch handles to push the expansion enclosure chassis completely into the rack.

Make sure that the self-locking latches are pushed in and fully engaged to prevent the expansion enclosure chassis from sliding out of the rack.

    c   Secure the expansion enclosure chassis to the rack using the orange shoulder screws.

    d   If the top cover is secured by two small shipping screws, remove the screws.

    e   Secure the top cover of the expansion enclosure chassis to the rack using the shoulder screws.

Install the Cable Management Arms

If you plan to use the cable management arms, install the cable management arms after installing the expansion enclosure in the rack.

About this task

Install the cable management arms into a rack with a depth of 1200 mm (47.2 in.).

Steps

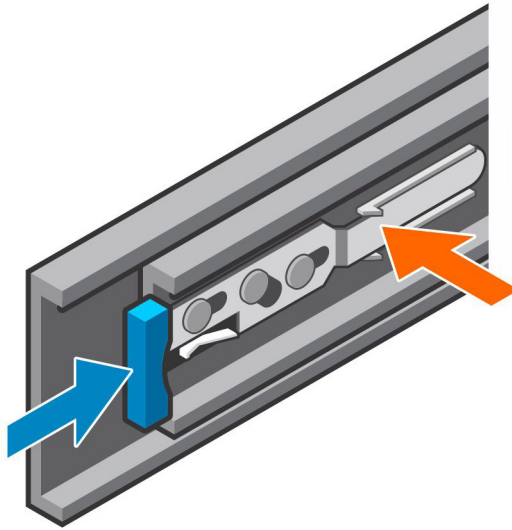1   Push in the blue tab on the back of the rails before installing the cable management arms.

Figure 20. Push in Blue Tab on Expansion Enclosure Rails

2   Align the retention latch end of the cable management arm with the enclosure bracket.

3   Insert the cable management arm into the enclosure bracket until you hear an audible click.

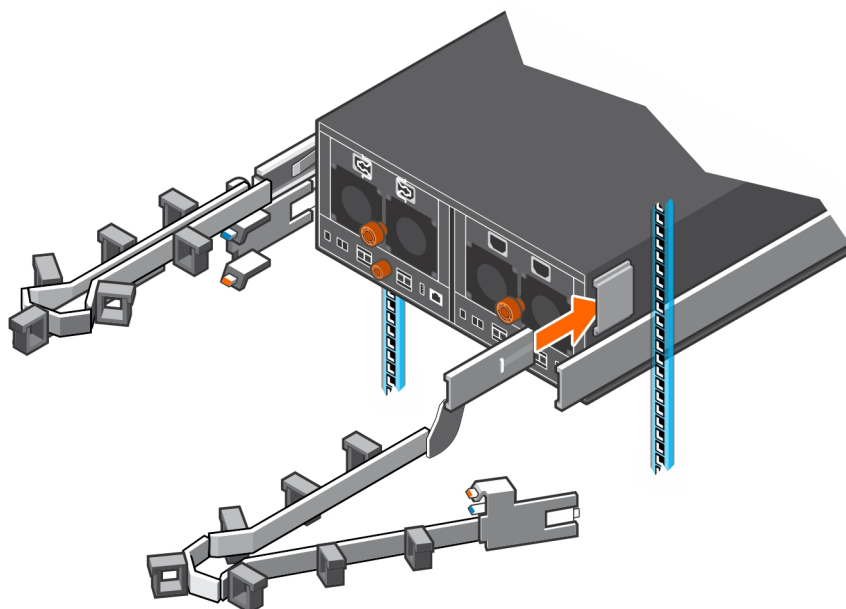   The audible click indicates that the cable management arm is secure.

Figure 21. Installing Cable Management Arms

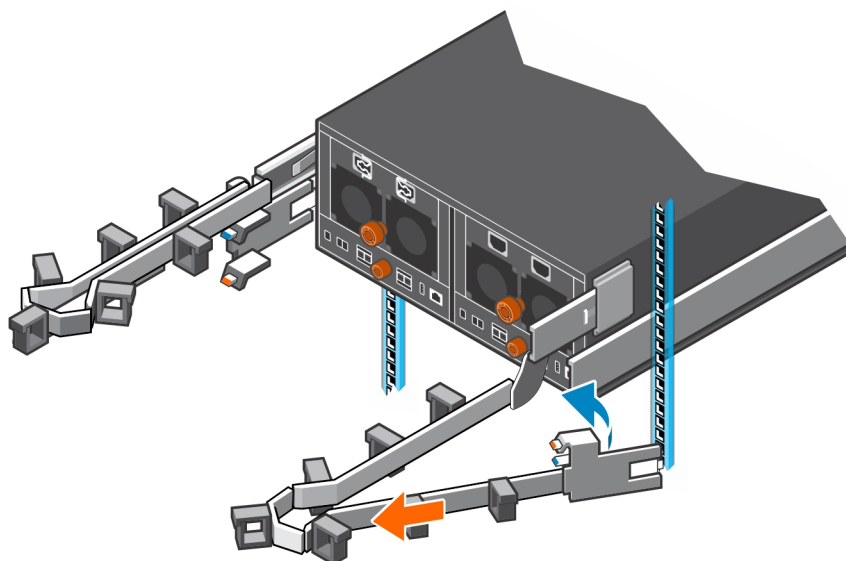4   Swing the extension arm into alignment with the rail bracket.

Figure 22. Align Extension Arm with Rail Bracket

5   Push the extension arm into the rail bracket until you hear an audible click.
      The audible click indicates that the cable management arm is secure.
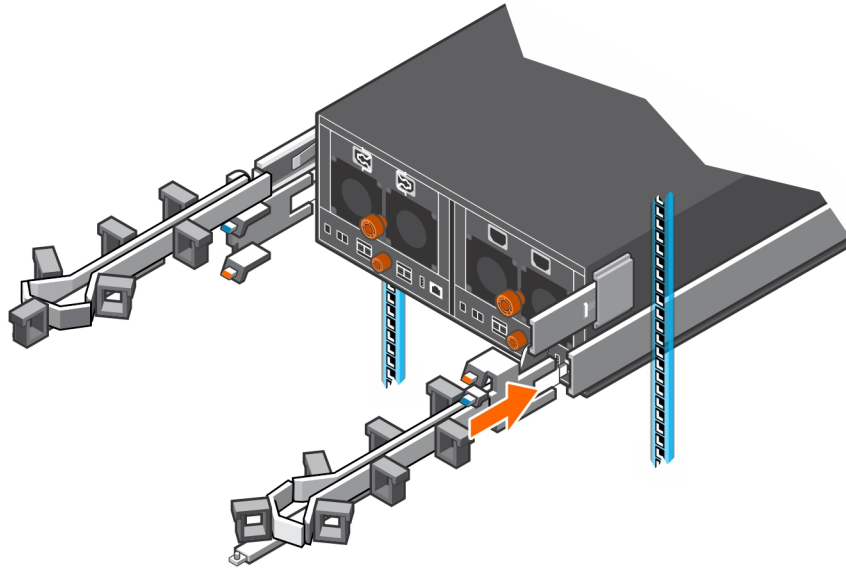
Figure 23. Insert Extension Arm into Rail Bracket

6   Repeat the previous steps for the second cable management arm.

7   Route the cables though the cable management arms.

    ⓘ **NOTE: Label all the cables before routing them through the cable management arms.**

      a   Open the plastic brackets on the cable management arm.

      b   Route the power cables and the Mini-SAS HD cables through the plastic brackets.

      c   Close the plastic brackets on the cable management arm.

8   Close the cable management arms.

      a   Swing the lower arm back and to the left side of the chassis.
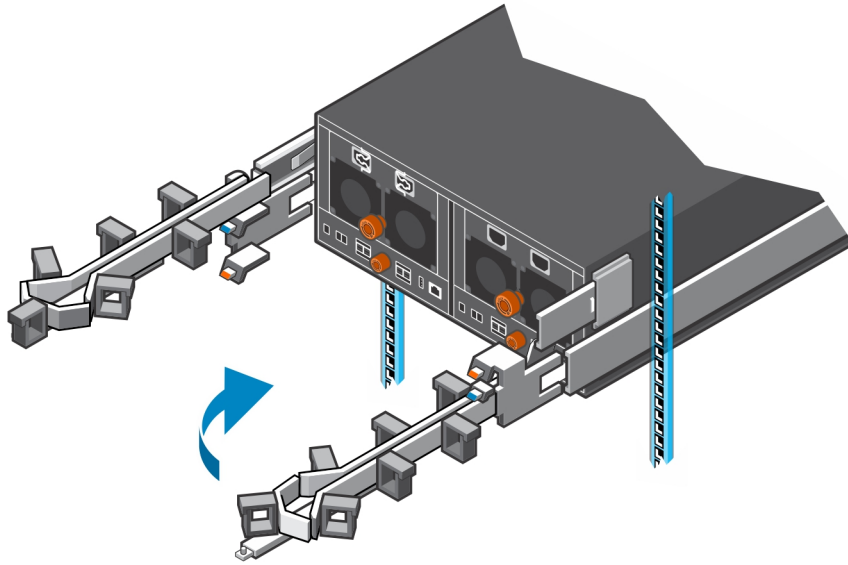
Figure 24. Swing Lower Arm to Left Side of Chassis

b   Swing the upper arm back and to the right side of the chassis.

c   Align the securing tab on the right end of the lower arm with the notch over the orange release tab.

d   Press the tab into the slot until you hear a click.

      The click indicates that the arm is secure.

Figure 25. Swing Upper Arm to Right Side of Chassis and Secure Lower Arm

e   Align the securing tab on the left end of the upper arm with the notch over the orange release tab,

f   Press the tab into the slot until you hear a click.

      The click indicates that the arm is secure.

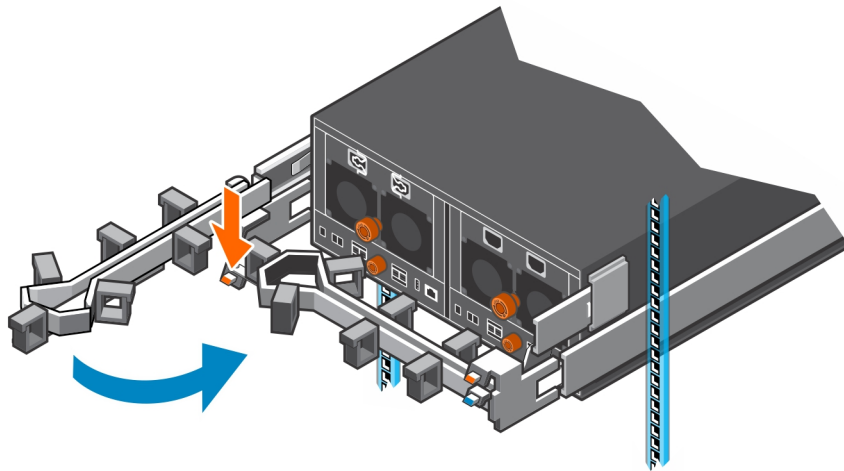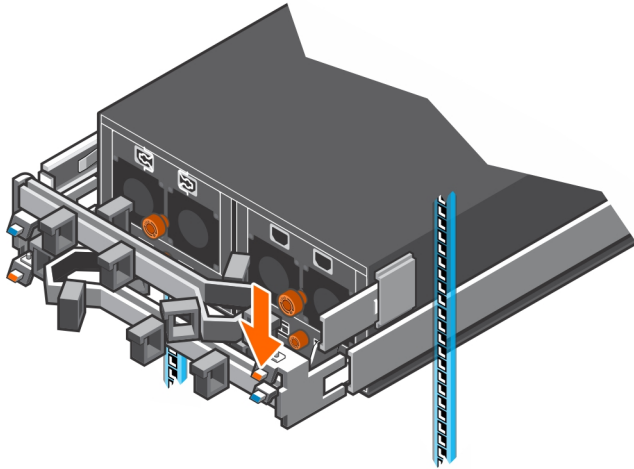Figure 26. Secure Cable Management Arm

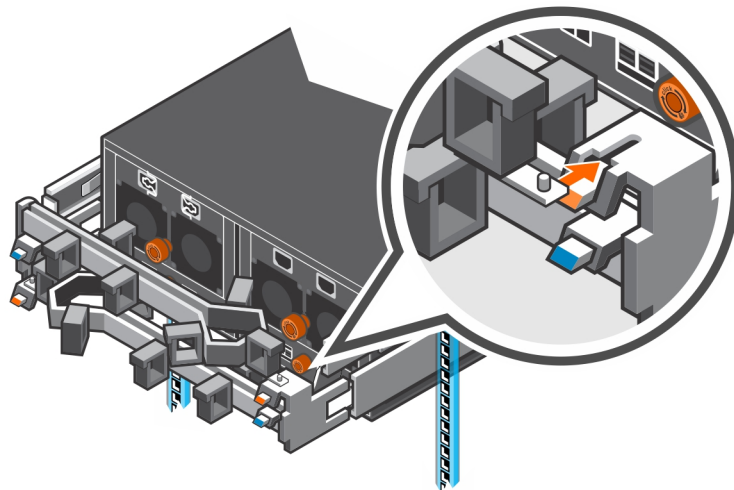9   Verify that the cable management arms are attached at the securing tabs.

Figure 27. Verify that Cable Management Arms are Secure

10   Connect the power cables and the Mini-SAS HD cables to the expansion enclosure.

Next steps

1   Power on the expansion enclosure and storage system.
2   Use SupportAssist to send diagnostic data to technical support.

Installing the Expansion Enclosure in a Non-Standard Rack

Follow these best practice guidelines when installing the SC460 expansion enclosure in a non-standard rack:

- A non-standard rack might have PDUs that face into the rack. This might cause interference between the expansion enclosure and/or rear cable management arms (if used). Carefully plan and route cables to minimize any interference. It might be necessary to use a different type of PDU that is mounted in the main rack area.
- The rack rails have four adjustment ranges, 18-22", 22-26", 26-30", 30-34". The default length is the 22-26" setting.
- After installing a rail, check the rail to make sure that it is level and in the correct location before installing the next rail.
- Use the M5 screws, which align with both round and square holes, to secure all rails and components in the rack.
- When securing rails to a rack, install the screws loosely to prevent cross threading, and tighten by hand. Do not over torque.
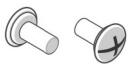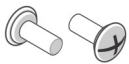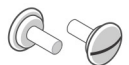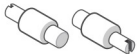
Install the Expansion Enclosure in a Non-Standard Rack

Perform the following steps to install the expansion enclosure in a non-standard rack.

Prerequisite

Identify the hardware that is used to install the rails in a non-standard rack.

Table 3. Identify the Hardware

Part	Part Number	Description
Screwdriver	034-000-193	6-in-1 screwdriver (Quantity: 1)
	042-013-076	Expansion enclosure chassis handle (Quantity: 4) Used to lift the expansion enclosure chassis onto a mechanical lift and mount it in a rack
	106-002-452	M5-0.8 x 10 mm Phillips pan-head SEMS screw (Quantity: 2) Used to secure the expansion enclosure rails to the front of the rack using the M5 screw holes in the rail
	106-002-453	M5-0.8 x 16 mm Phillips pan-head SEMS screw (Quantity: 2) Used to secure the expansion enclosure rails to the back of the rack using the M5 screw holes in the rail
	036-028-018	M4-0.7 x 10 mm flathead screw (Quantity: 4) Used to secure expansion enclosure rails to the front and back of the rack using the M4 screw holes in the rail
Optional alignment pins		
	036-028-016	3.8 mm alignment pin (Quantity: 8) Replacement alignment pin used to mount rails in a rack with M5, #10-32, or #12-24 threaded holes
	036-028-017	4.8 mm alignment pin (Quantity: 8) Replacement alignment pin used to mount rails in a rack with M6 threaded holes

Part	Part Number	Description

Steps

1 Determine where to mount the SC460 expansion enclosure in the rack.

2 If necessary, use the screwdriver to adjust the length of the expansion enclosure rack rails to fit the rack.

3 The rails are shipped with 6.8 mm alignment pins that are designed to fit into a standard rack.

   To install the rails in a non-standard rack, you might need to replace the alignment pins in the rails with the appropriate alignment pins.

   a Using a flat-head screwdriver, remove the 6.8 mm alignment pins from the front and back of the rails.

   b Identify the appropriate alignment pins (3.8 mm or 4.8 mm) to use in the non-standard rack.

   c Install the appropriate alignment pins onto front and back of the rails.

4 Attach the right rail to the back post of the rack.

   a Align the right rail with the lower two U spaces of the 4U mounting location.

   b With the release latch on the outer part of the rack post, place the catch mechanism over the post.

   c Push the rail back to secure the rail to the rack post.

   d Secure the rail to the rack using the appropriate screws.

5 Attach the right rail to the front post of the rack.

   a Align the right rail with the lower two U spaces of the 4U mounting location.

   b Pull the rail forward, with the alignment pins in the middle holes of the bottom two U spaces of the 4U mounting location.

   c Secure the rail to the rack using the appropriate screws.
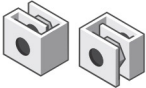
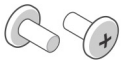6 Repeat the previous steps to install the left rail.

Secure the Expansion Enclosure Chassis and Top Cover in a Non-Standard Rack
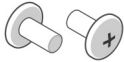
Perform the following steps to secure the expansion enclosure in a rack that is not compatible with the semi-captive M5 shoulder screws.

Prerequisite

Identify the hardware used to secure an expansion enclosure in a non-standard rack.

Table 4. Identify the Hardware

Part	Part Number	Description
	106-569-307	M5-0.8 clip nut (Quantity: 6) Used to secure the expansion enclosure chassis and top cover to a rack that does not have threaded holes
	036-032-010	M5-0.8 x 12 mm truss head Phillips screw with nylon patch (Quantity: 2) Used to secure the top cover of the expansion enclosure to a rack with M5 threaded holes
	036-032-011	M6-1.0 x 12 mm truss head Phillips screw with nylon patch (Quantity: 6) Used to secure the expansion enclosure chassis and top cover to a rack with M6 threaded holes
	036-032-009	#10-32 x 1/2 in. truss head Phillips screw with nylon patch (Quantity: 6)

Part	Part Number	Description
		Used to secure the expansion enclosure chassis and top cover to a rack with #10-32 threaded holes
	036-032-012	#12-24 x 1/2 in. truss head Phillips screw with nylon patch (Quantity: 6) Used to secure the expansion enclosure chassis and top cover to a rack with #12-24 threaded holes

Steps

1 Remove the semi-captive M5 shoulder screws from the expansion enclosure chassis and top cover.

2 In a rack with without threaded holes, place M5 clip nuts into the mounting holes on the rack that line up with the holes on the expansion enclosure and top cover.

3 Secure the expansion enclosure and top cover to the rack using the appropriate truss head screws.

Connect the Power Cables

Connect the power cables to the SC460 expansion enclosure.

About this task

Steps

1 Connect the power cables to the power supplies in the expansion enclosure.
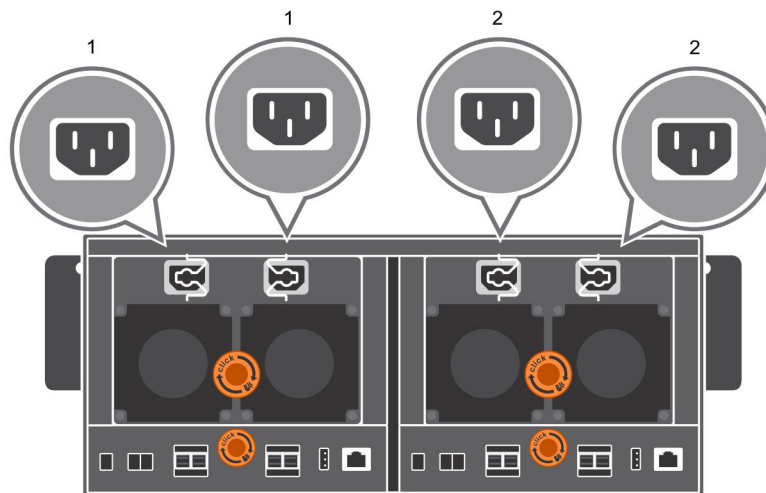
Figure 28. Connect Power Cables to the Power Supplies

	1	Left power supply		2	Right power supply

2 Secure each power cable to the expansion enclosure using the strain relief clamp.

3 Connect the power cables plugged into the left power supply to one PDU.

4 Connect the power cables plugged into the right power supply to a second PDU.

5 Label both ends of the power cords to identify the power supply and PDU to which each power cord is connected.

Install the Front Bezel

If a front bezel is shipped with the SC460 expansion enclosure, install the bezel on the front of the expansion enclosure.

1 Align the bezel with the front of the expansion enclosure.
2 Press the two latches on front of bezel.

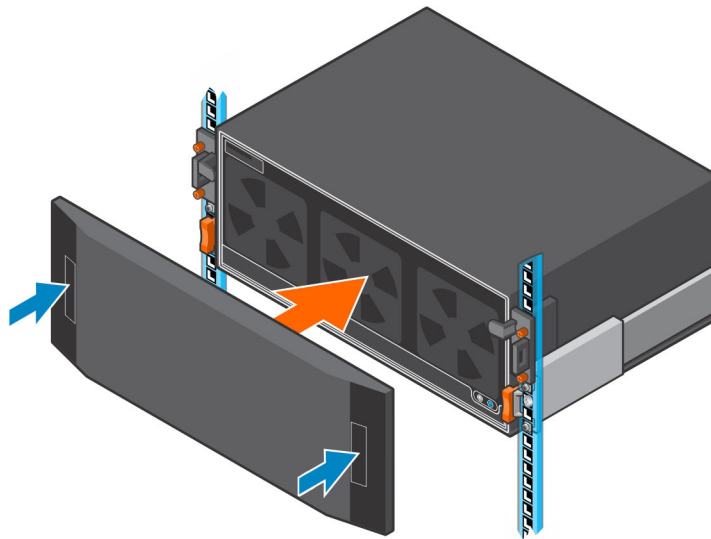

Figure 29. Install the Bezel

3 Push the bezel into place until it attaches to the expansion enclosure.
4 Release the latches on the front on the bezel.
5 If the bezel has key lock, lock the bezel with the key.

Replacing SC460 Expansion Enclosure Components

This chapter describes how to replace field replaceable units (FRUs) inside the SC460 expansion enclosure.

This chapter assumes that the installer has received the FRU and is ready to install it in the expansion enclosure.

Topics:

Safety Precautions

Always follow these safety precautions to avoid injury and damage to Storage Center equipment.

If equipment described in this guide is used in a manner not specified by Dell, the protection provided by the equipment could be impaired. For your safety and protection, observe the rules described in the following sections.

ⓘ **NOTE: See the safety and regulatory information that shipped with each Storage Center component. Warranty information is included as a separate document.**

Installation Safety Precautions

Follow these safety precautions when installing an SC460 expansion enclosure:

Caution

Equipment exceeds 90 kg (200 lb). Use appropriate lifting methods when installing an SC460 expansion enclosure.

- You can install the expansion enclosure chassis without using a mechanical lift if you remove the drives, cooling fans, power supply units (PSUs), and enclosure management modules (EMMs) from the chassis before installing it.

You must use a mechanical lift to install the expansion enclosure chassis if you do not remove the drives, cooling fans, PSUs, and EMMs from the chassis.

- Dell recommends that only individuals with rack-mounting experience install an SC460 expansion enclosure in a rack.
- When installing multiple expansion enclosures in a rack, fill the rack from the bottom up and empty the rack from the top down.
- The rack construction must support the total weight of the installed expansion enclosures. The design should incorporate stabilizing features suitable to prevent the rack from tipping or being pushed over during installation or in normal use.
- To prevent the rack from tipping, slide only one expansion enclosure out of the rack at a time.
- Make sure that the expansion enclosure is always fully grounded to prevent damage from electrostatic discharge.
- When handling the expansion enclosure components, use an electrostatic wrist guard or a similar form of protection.

Bezel

The front bezel is a cover for the front panel of the SC460 expansion enclosure.

Remove the Front Bezel

Before you remove or install hard drives in the expansion enclosure, remove the front bezel.

1   If the bezel has key lock, unlock the bezel with the key.
2   Press the two latches on the front on the bezel.
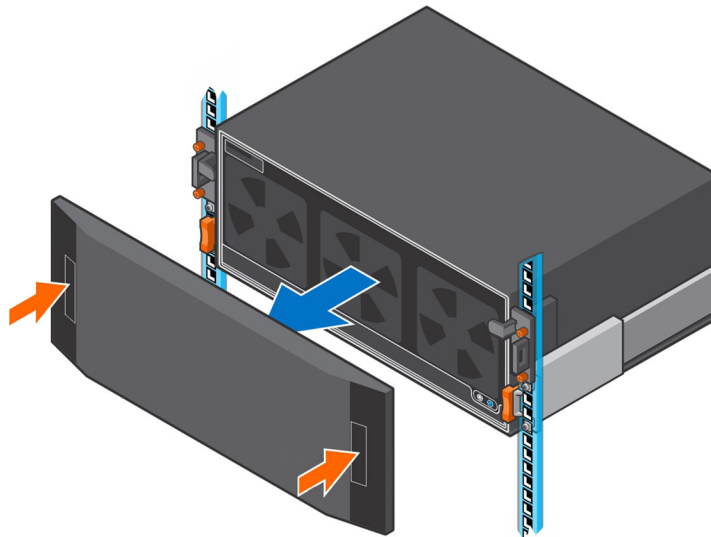3   Pull the bezel away from the expansion enclosure.

Figure 30. Remove the Bezel

Install the Front Bezel

If a front bezel is shipped with the SC460 expansion enclosure, install the bezel on the front of the expansion enclosure.

1   Align the bezel with the front of the expansion enclosure.
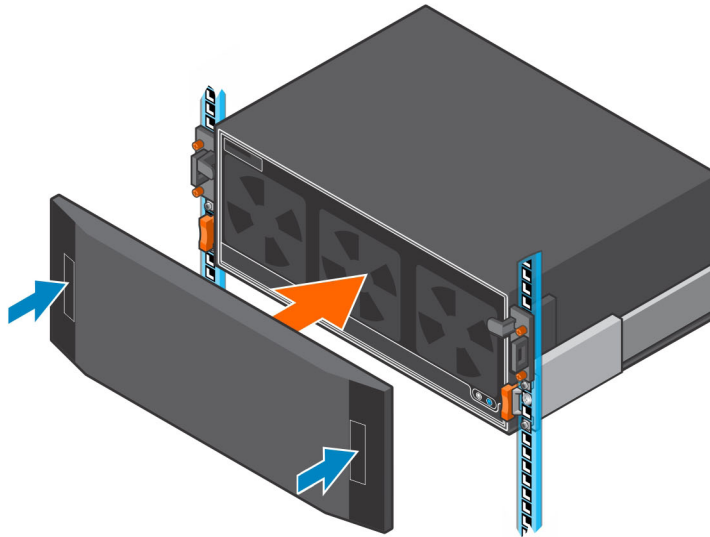2   Press the two latches on front of bezel.

3   Push the bezel into place until it attaches to the expansion enclosure.

4   Release the latches on the front on the bezel.

5   If the bezel has key lock, lock the bezel with the key.

Pre-Replacement Procedures

Perform the procedures described in this chapter before replacing a component of the SC460 expansion enclosure.

Send Diagnostic Data Using SupportAssist

Before replacing components, use SupportAssist to send diagnostic data to technical support.

1   Use Storage Manager to connect to the Storage Center.

2   In the **Summary** tab, click **Send SupportAssist Information Now**, which is located under **SupportAssist Actions** in the **Status** pane.
    The **Send SupportAssist Information Now** dialog box opens.

3   Select **Storage Center Configuration** and **Detailed Logs**.

4   Click **OK**.

Change the Operation Mode of the Storage Center to Maintenance

Change the operation mode of the Storage Center to Maintenance before replacing components.

1   Use Storage Manager to connect to the Storage Center.

2   In the **Summary** tab, click **Edit Settings**. The **Edit Storage Center Settings** dialog box opens.

3   Click the **General** tab.

4   In the **Operation Mode** field select **Maintenance**. Selecting **Maintenance** isolates alerts from those that would occur during normal operation.

5   Click **OK**.

Shut Down the Storage System and Expansion Enclosures

If the replacement component is not hot-swappable, use the Storage Manager to shut down the storage system and expansion enclosures. Shutting down the storage system and expansion enclosures results in a system outage, so plan to perform these procedures during a maintenance window.

Prerequisites

Before shutting down the storage system and expansion enclosures, perform the following tasks:

1 Identify the part to replace.
2 Locate the replacement part.
3 Make sure that you have the tools required to replace the part.

Steps

1 From the Actions menu, select **System→ Shutdown/Restart**. The **Shutdown/Restart** dialog box opens.
2 From the **What should the Storage Center do?** drop-down menu, select **Shut Down**.
3 Click **OK**.

   When the storage system and expansion enclosures are shut down, unplug the power cables from the storage system and expansion enclosures.

Hard Drives

The SC460 expansion enclosure supports up to 60 3.5-inch hot-swappable hard drives installed in five row by twelve column configuration.

Identifying the Failed Hard Drive

To determine which hard drive failed, use Storage Manager.

1 Click the **Hardware** tab.
2 In the **Hardware** tab navigation pane, select and expand the Storage Center.
3 In the **Hardware Alerts** area, find the hardware alert that identifies the expansion enclosure with the failed hard drive.
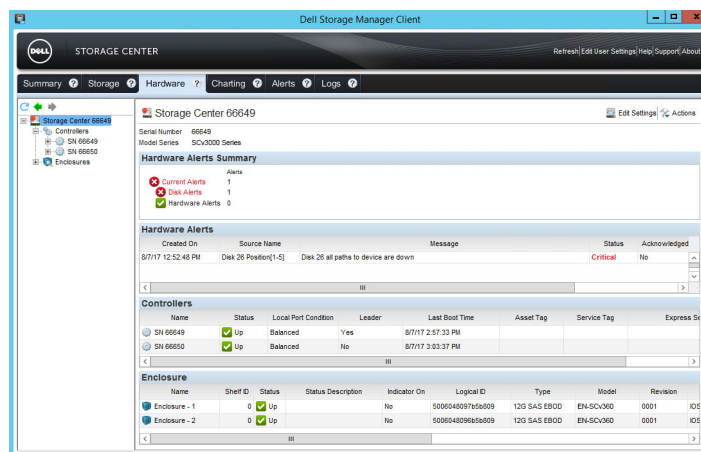

Figure 32. Hardware Alert Identifying the Expansion Enclosure with the Failed Hard Drive

4 In the **Hardware** tab navigation pane, expand the expansion enclosure identified in the previous step.
5 Select **Disks**. The status of each disk is displayed in the **Disks** tab.
6 Select the failed hard drive.

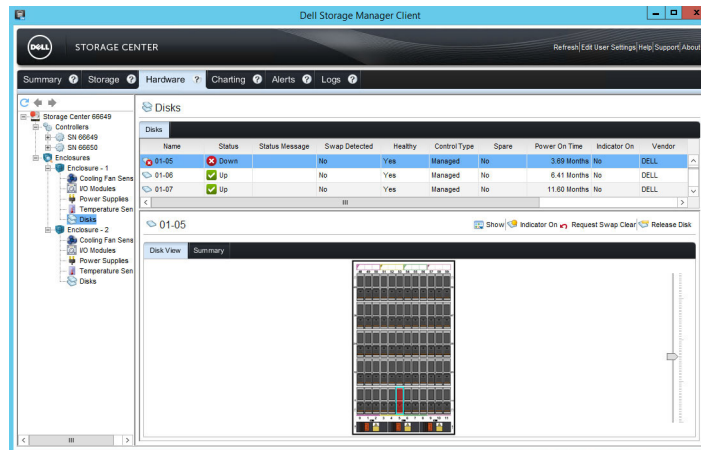The location of the failed hard drive is displayed in the **Disk View** tab.

Figure 33. Disk View Showing the Failed Hard Drive

Remove a Hard Drive

Use this procedure to remove a hard drive from the expansion enclosure.

Prerequisites

1   Use SupportAssist to send diagnostic data to technical support.

2   Change the operation mode of the Storage Center to Maintenance.

About this task

You can remove a hard drive without shutting down the expansion enclosure.

⚠ | **CAUTION: A drive must be replaced within 10 minutes of extending the expansion enclosure from the rack.**

Steps

1   Remove the front bezel.

2   Extend the expansion enclosure chassis from the front of the rack.

3   To release the hard drive, push the orange release tab on the drive carrier towards the front of the expansion enclosure.

4   Lift the latch on the drive carrier and slowly pull the drive up approximately 3 cm (1 in.).
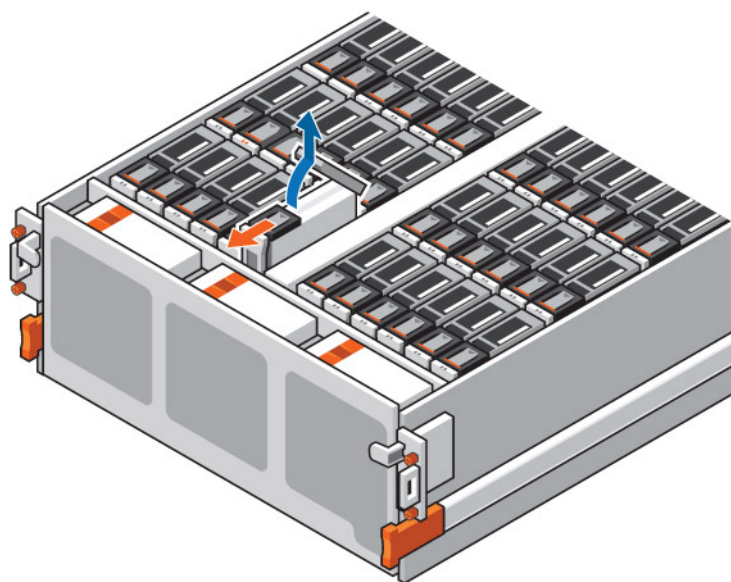
Figure 34. Releasing a Hard Drive

- If the drive fault LED is on, pull the drive up an additional 5 cm (2 in.). Wait 30 seconds for the drive to stop spinning and pull the drive completely out of the slot.
- If the drive fault LED is off, pull the drive completely out of the slot.
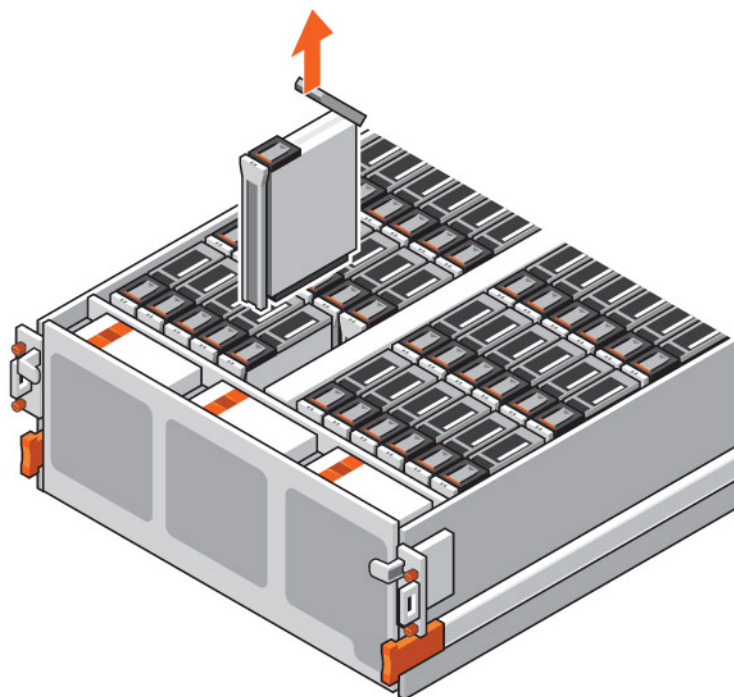

Figure 35. Removing a Hard Drive

Install a Hard Drive

Use this procedure to install a hard drive in the expansion enclosure.

About this task

Do not drop the hard drive into the slot. Dropping the hard drive into the slot might damage the drive and the drive interface backplane, which requires a full chassis replacement to repair.

⚠ **CAUTION: A drive must be replaced within 10 minutes of extending the expansion enclosure from the rack.**

Steps

1   Open the latch on the drive carrier.
2   Align the drive with the guides and gently lower the disk into the slot.
    The latch begins to close when the drive carrier meets the backplane.
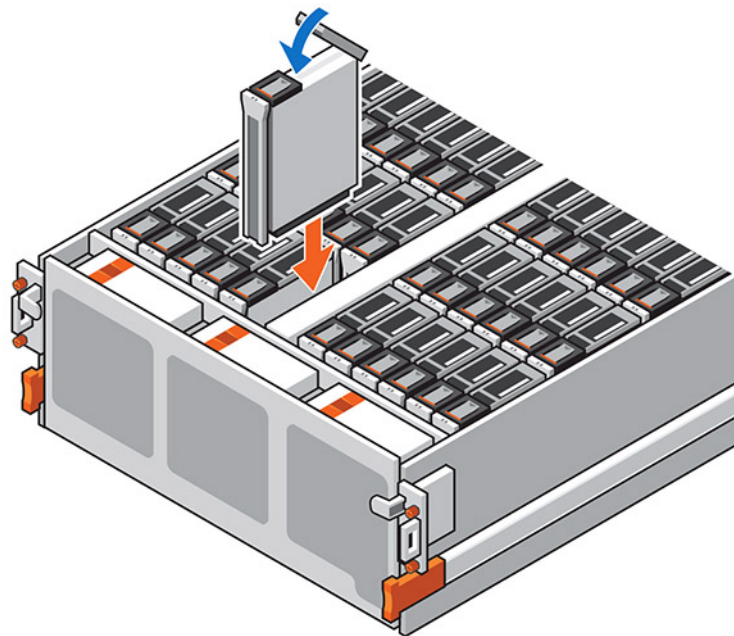3   Push down on the latch tab to engage the latch.

Figure 36. Installing a Hard Drive

4   When the latch is engaged, push on the drive carrier to verify that the drive is properly seated.
5   Wait for the expansion enclosure to recognize the hard drive and determine its status.
6   Push the expansion enclosure chassis back into the rack.
7   In Storage Manager, make sure that the hard drive is recognized and shown as up and running.

Next steps

1   Use SupportAssist to send diagnostic data to technical support.
2   Change the operation mode of the Storage Center to Normal.

Cooling Fan Modules

The SC460 expansion enclosure supports three cooling fan modules. If one cooling fan module fails, the remaining cooling fan modules continue to cool the expansion enclosure.

ⓘ | NOTE: When a cooling fan module fails, the fan speed in the remaining modules increases significantly to provide adequate cooling. The cooling fan speed decreases gradually when a new cooling fan module is installed.

Identifying the Failed Cooling Fan Module

To determine which cooling fan module failed, use Storage Manager.

1   Click the **Hardware** tab.
2   In the **Hardware** tab navigation pane, select and expand the Storage Center.
3   In the **Hardware Alerts** area, find the hardware alert that identifies the expansion enclosure with the failed cooling fan module.
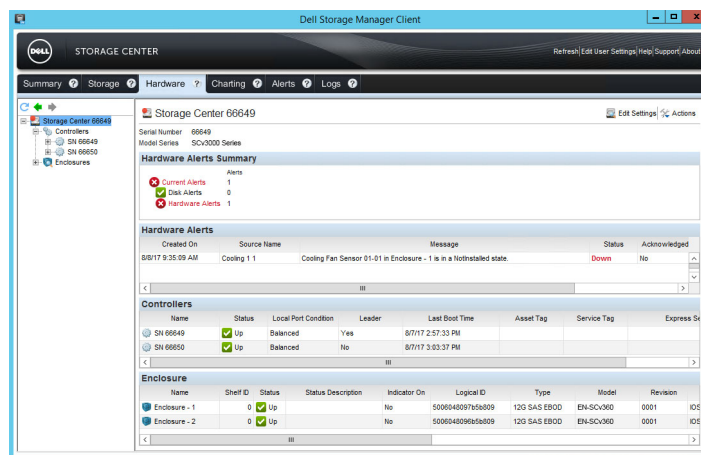

Figure 37. Hardware Alert Identifying the Expansion Enclosure with the Failed Cooling Fan

4   In the **Hardware** tab navigation pane, expand the expansion enclosure identified in the previous step.
5   Select **Cooling Fans**.
    The status of each cooling fan module is displayed in the **Cooling Fans** tab.
6   Select the failed cooling fan.
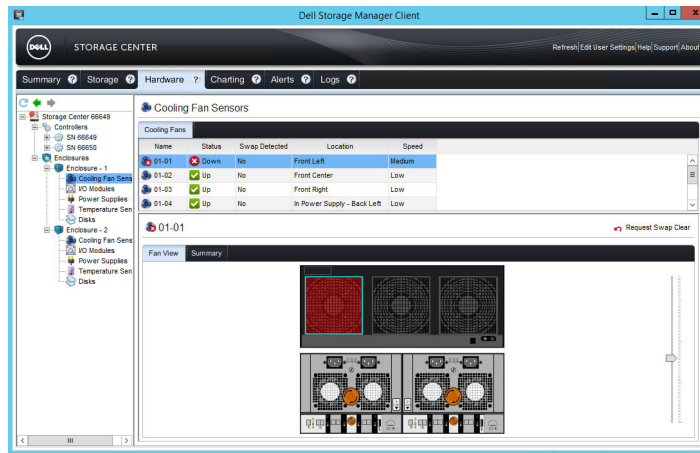   The location of the failed cooling fan module is displayed in the **Fan View** tab.

Figure 38. Rear View of the Expansion Enclosure Showing the Failed Cooling Fan Module

Remove a Cooling Fan Module

Use this procedure to remove a cooling fan module.

Prerequisites

1   Use SupportAssist to send diagnostic data to technical support.
2   Change the operation mode of the Storage Center to Maintenance.

About this task

You can remove a cooling fan module without shutting down the expansion enclosure. However, the expansion enclosure must have at least two cooling fan modules installed while the expansion enclosure is powered up. Do not remove more than one cooling fan module while AC power is on.

> △ **CAUTION: A cooling fan module must be replaced within five minutes of extending the expansion enclosure from the rack. Do not remove a faulted fan unless a replacement is on hand and available to be installed within five minutes.**

Steps

1   Remove the front bezel.
2   Extend the expansion enclosure chassis from the front of the rack.
3   Unlock the fan module by pushing the orange tab to the left.
4   Pull up on the latch handle to release the fan module.
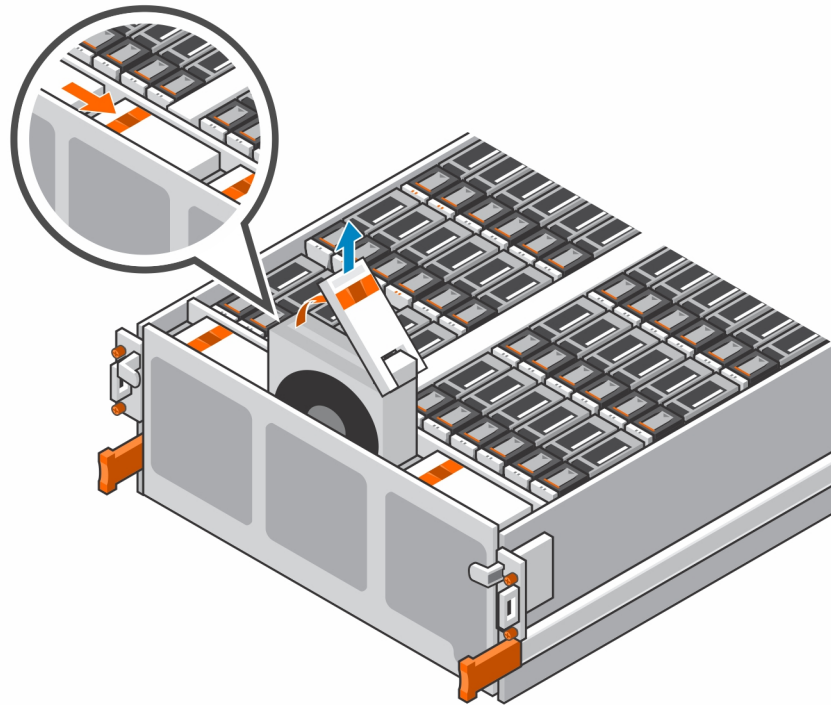5   Pull the fan module up and out of the chassis.

Figure 39. Removing a Cooling Fan Module

Install a Cooling Fan Module

Use this procedure to install a cooling fan module.

About this task

The expansion enclosure must have at least two cooling fan modules installed while the expansion enclosure is powered up. Do not remove more than one cooling fan module while AC power is on.

⚠ **CAUTION: A cooling fan module must be replaced within five minutes of extending the expansion enclosure from the rack. Do not remove a faulted fan unless a replacement is on hand and available to be installed within five minutes.**

Steps

1   Align the cooling fan with the guides in the empty slot.

2   Gently lower the cooling fan into the empty slot.

3   Push the latch down into the closed position.

4   Push the black tab above the orange release tab down until you hear a click.

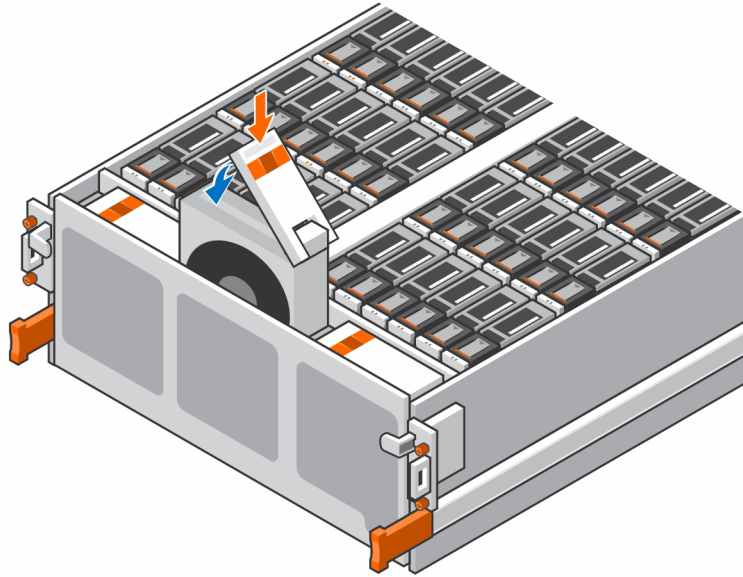   The click indicates that the fan is seated and secure in the slot.

Figure 40. Installing a Cooling Fan Module

5   Wait for the expansion enclosure to recognize the cooling fan module and determine its status.

6   Push the expansion enclosure chassis back into the rack.

7   In Storage Manager, make sure that the cooling fan module is recognized and shown as up and running.

Next steps

1   Use SupportAssist to send diagnostic data to technical support.

2   Change the operation mode of the Storage Center to Normal.

Enclosure Management Module

The SC460 expansion enclosure supports redundant hot-swappable enclosure management modules (EMMs).

EMMs provide the following management functions for the expansion enclosure:

- Monitoring and controlling expansion enclosure environment elements such as temperature, fan, power supplies, and expansion enclosure LEDs
- Controlling access to hard drives
- Communicating expansion enclosure attributes and states to Storage Center

Identifying the Failed Enclosure Management Module

To determine which enclosure management module (EMM) failed, use the Storage Manager.

1   Click the **Hardware** tab.

2   In the **Hardware** tab navigation pane, select and expand the Storage Center.

3   In the **Hardware Alerts** area, find the hardware alert that identifies the expansion enclosure with the failed EMM.
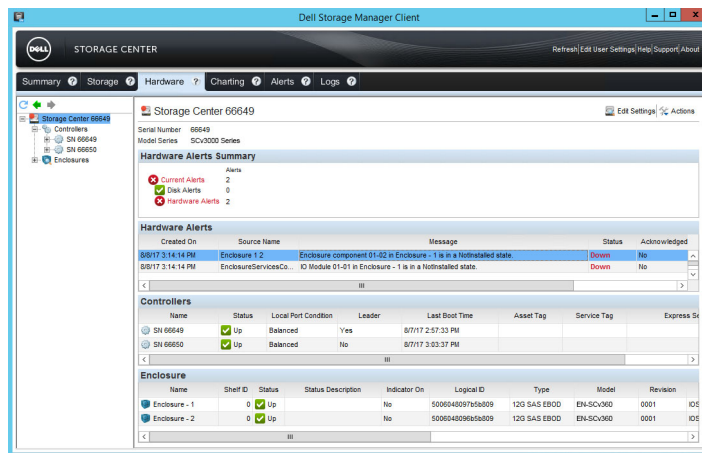
Figure 41. Hardware Alert Identifying the Expansion Enclosure with the Failed EMM

4   In the **Hardware** tab navigation pane, expand the expansion enclosure identified in the previous step.
5   Select **I/O Modules**.
The status of each EMM is displayed in the **I/O Modules** tab.
6   Select the failed EMM.
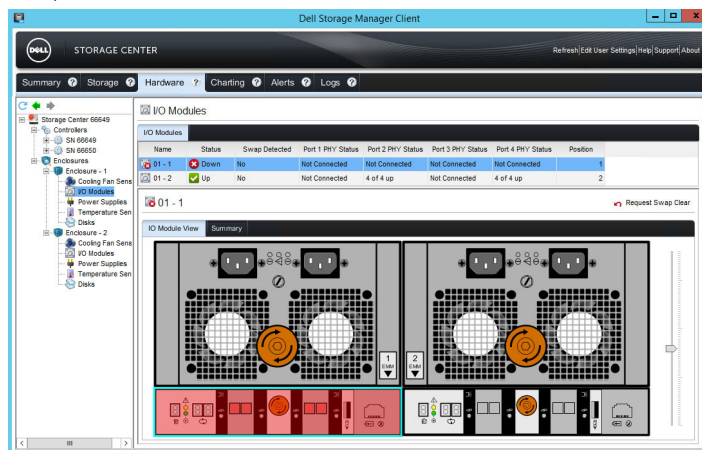The location of the failed EMM is displayed in the **I/O Module View** tab.

Figure 42. Rear View of the Expansion Enclosure Showing the Failed EMM

Remove an Enclosure Management Module

Use this procedure to replace a EMM.

Prerequisites

1   Use SupportAssist to send diagnostic data to technical support.
2   Change the operation mode of the Storage Center to Maintenance.

About this task
EMMs can be replaced one at a time without shutting down the expansion enclosure.

ⓘ | **NOTE: Make sure the SAS cables are labeled before disconnecting the cables from the EMM.**

Steps

1   If the expansion enclosure is installed with cable management arms (CMAs), open the CMAs.

2   Disconnect the SAS cables connected to the EMM.

3   Turn the screw handle counter-clockwise until the EMM is unseated from the chassis.

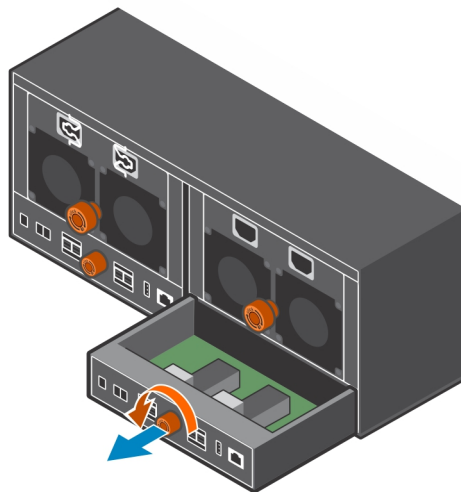4   Slide the EMM out of the chassis and place it on a clean, static-free surface.

Figure 43. Removing an EMM

Install an Enclosure Management Module

Use this procedure to install an EMM.

About this task

EMMs can be replaced one at a time without shutting down the expansion enclosure.

Steps

1   Align the EMM with the empty slot in the chassis.

2   Push the EMM into the chassis until it stops.

3   Turn the screw handle clockwise until a single click is heard.
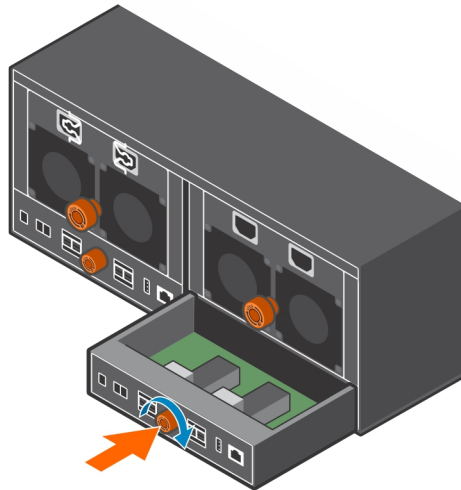
The single click indicates the EMM is fully seated.

4   Match the labels on the SAS cables with the correct connectors on the EMM.

5   Reconnect the SAS cables to the EMM.

6   Wait for the expansion enclosure to recognize the EMM and determine its status.

7   In Storage Manager, make sure that the EMM is recognized and shown as up and running.

Next steps

1   Use SupportAssist to send diagnostic data to technical support.

2   Change the operation mode of the Storage Center to Normal.

Power Supply Units

The SC460 expansion enclosure supports two hot-swappable power supply units (PSUs). If one unit fails, the second unit continues to provide power to the expansion enclosure.

Identifying the Failed PSU

To determine which power supply unit (PSU) failed, use the Storage Manager.

1   Click the **Hardware** tab.

2   In the **Hardware** tab navigation pane, select and expand the Storage Center.

3   In the **Hardware Alerts** area, find the hardware alert that identifies the expansion enclosure with the failed power supply.
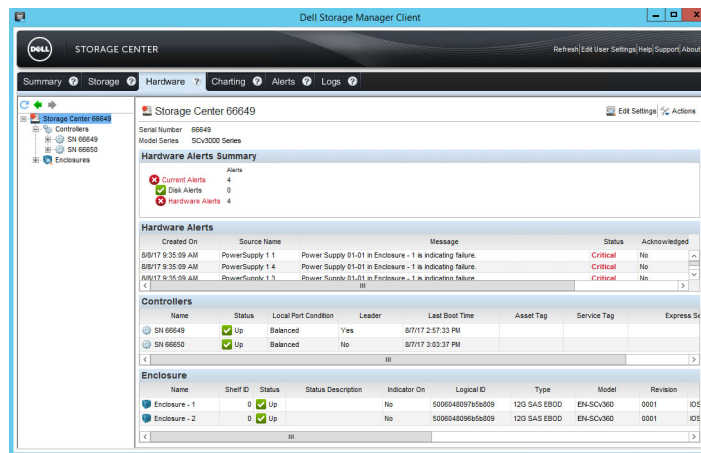
Figure 45. Hardware Alert Identifying the Expansion Enclosure with the Failed Power Supply

4   In the **Hardware** tab navigation pane, expand the expansion enclosure identified in the previous step.

5   Select **Power Supplies**.

The status of each power supply is displayed in the **Power Supplies** tab.

6   Select the failed power supply.

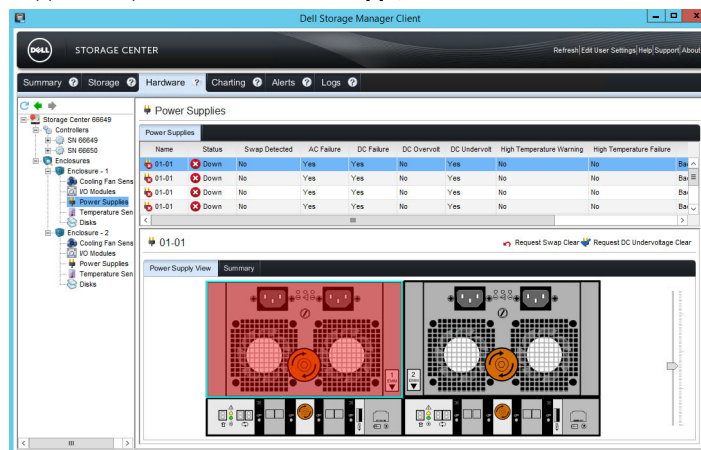The location of the failed power supply is displayed in the **Power Supply View** tab.

Figure 46. Rear View of the Expansion Enclosure Showing the Failed the Power Supply

Remove a PSU

Use this procedure to remove a power supply unit (PSU) from the expansion enclosure.

Prerequisites

1   Use SupportAssist to send diagnostic data to technical support.

2   Change the operation mode of the Storage Center to Maintenance.

About this task

You can remove a single PSU without shutting down the expansion enclosure.

ⓘ | **NOTE: Make sure the power cables are labeled before disconnecting them from the PSU.**

Steps

1   If the expansion enclosure is installed with cable management arms (CMAs), open the CMAs.
2   Remove the strain relief clamps from the power cables and disconnect the power cables from the PSU.
3   Turn the screw handle counter-clockwise until the PSU is unseated from the chassis.
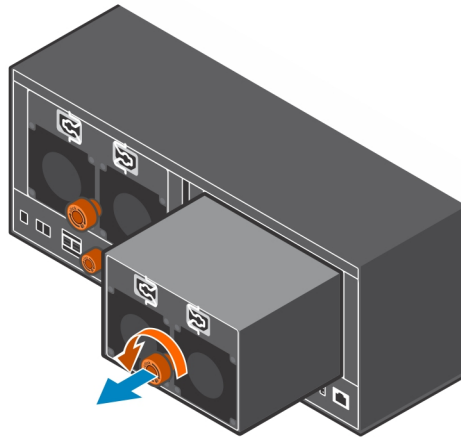4   Slide the PSU out from the chassis and place it on a clean, static-free surface.

Figure 47. Removing a PSU

Install a PSU

Use this procedure to install a power supply unit (PSU) in the expansion enclosure.

Steps

1   Slide the replacement PSU into the expansion enclosure chassis.
2   Turn the screw handle clockwise until a single click is heard.
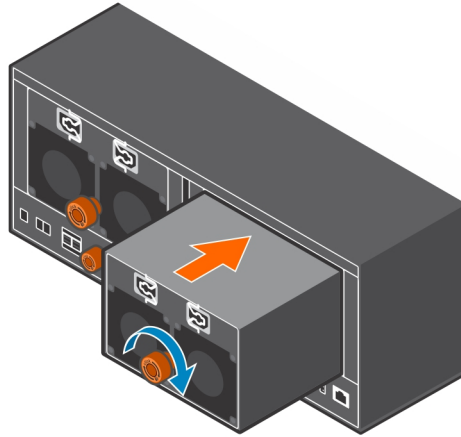   The single click indicates the PSU is fully seated.

Figure 48. Installing a PSU

3   Match the labels on the power cables with the correct power connectors on the PSU.
4   Reconnect the power cables to the PSU and secure the power cables using the strain relief clamps.
5   Wait for the expansion enclosure to recognize the PSU and determine its status.
6   In Storage Manager, make sure that the PSU is recognized and shown as up and running.

Next steps

1   Use SupportAssist to send diagnostic data to technical support.
2   Change the operation mode of the Storage Center to Normal.

1U Cable Management Tray

The SC460 expansion enclosure supports a 1U cable management tray.

If you plan to use the 1U cable management tray, install the tray before installing the expansion enclosure. The 1U cable management tray is installed in the 1U space below the expansion enclosure.

Remove the Cable Management Tray

Removal of the 1U cable management tray must be performed during a scheduled maintenance window when the Storage Center system is unavailable to the network.

Prerequisites

1   Use SupportAssist to send diagnostic data to technical support.
2   Change the operation mode of the Storage Center to Maintenance.
3   Use Storage Manager to shut down the storage system connected to the expansion enclosure.

Steps

1   Make sure all the cables are labeled.
2   Disconnect the power cables and Mini-SAS HD cables from the expansion enclosure.
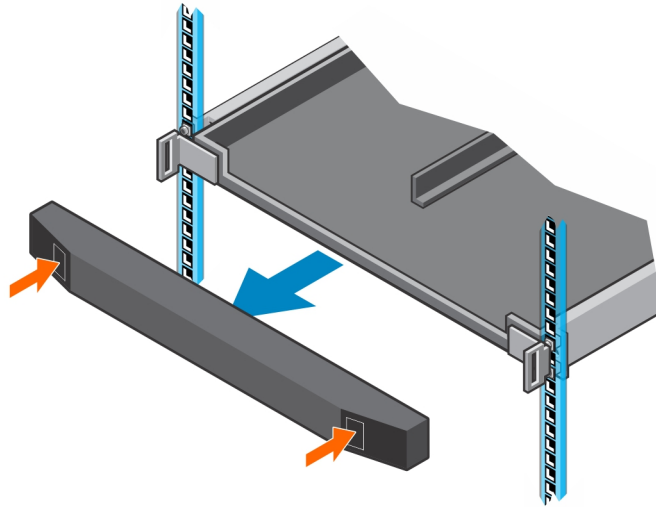3   Remove the bezel from the front of the tray.

Figure 49. Remove the Front Bezel

4   Press the tabs on the inner cable chains to disconnect the cable guide clips from the chassis bracket.
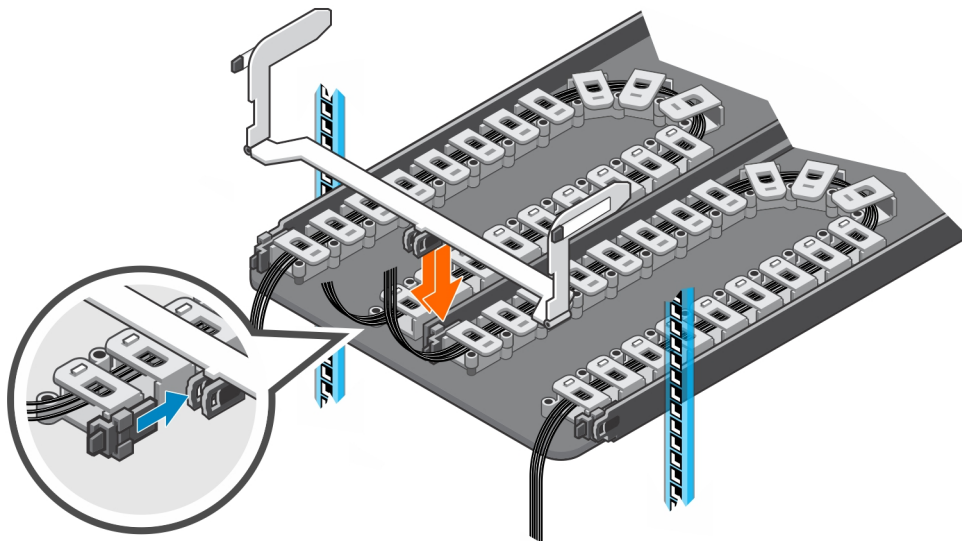

Figure 50. Disconnect Cable Chains from the Chassis Bracket

5   Press the tabs on the outer cable chains to disconnect the cable guide clips from the 1U cable management tray.
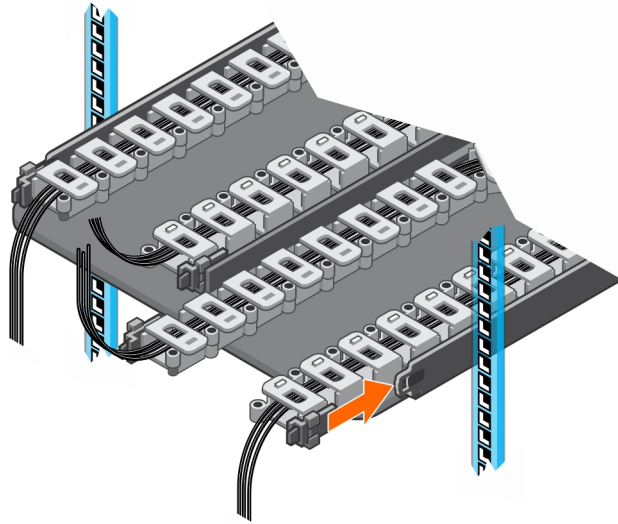
Figure 51. Disconnect Cable Chains from the Tray

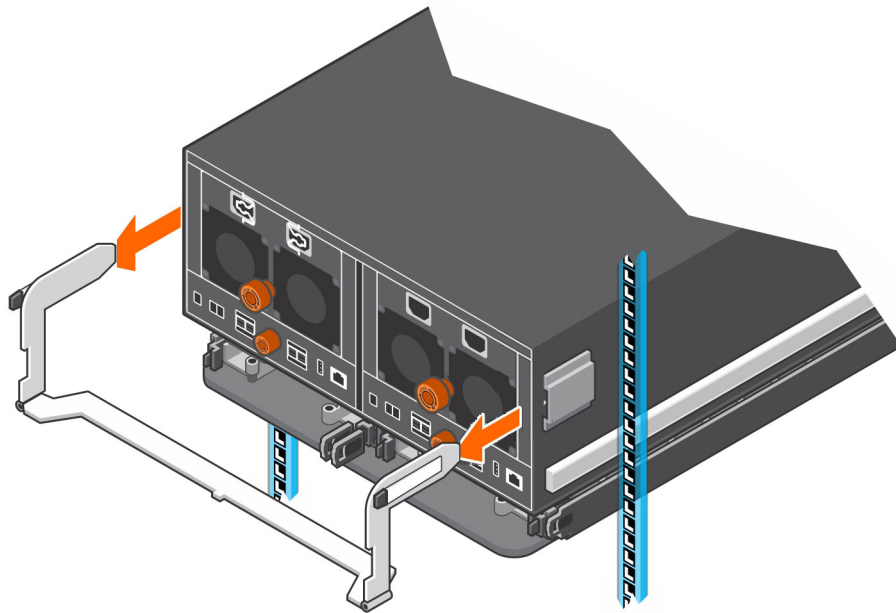6   Press the tabs on the chassis bracket and remove the chassis bracket from the sides of the chassis.

Figure 52. Remove Chassis Bracket from the Chassis
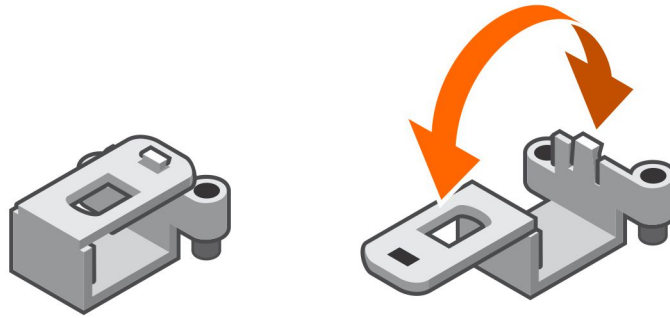
7   Unclip and open all the latches on the cable chains.

Figure 53. Open the Cable Chain Latches

8   Remove the cables from the cable chains and remove the cable chains from the 1U cable management tray.

9   At the front of the 1U cable management tray, push up on the spring clips to release the tray.

Figure 54. Release Tray Using the Spring Clips

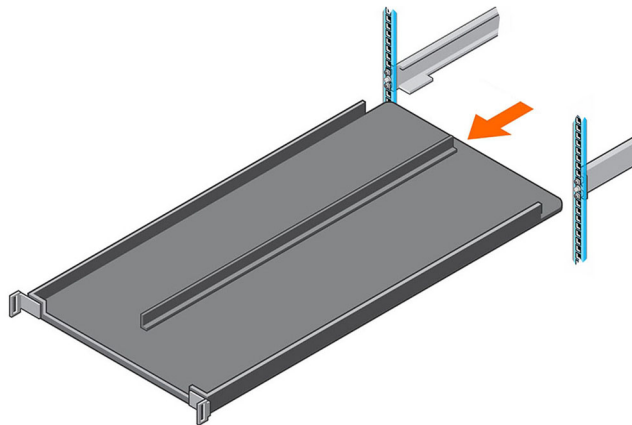10   Pull the 1U cable management tray towards the front of the rack until it is free from the rails.

Figure 55. Remove Tray from the Rails

11   Remove the 8-32 x 0.75 in. screws from the front and back of the rails.

12   Pull back on the rails until the adaptors clear the front of the rack holes.
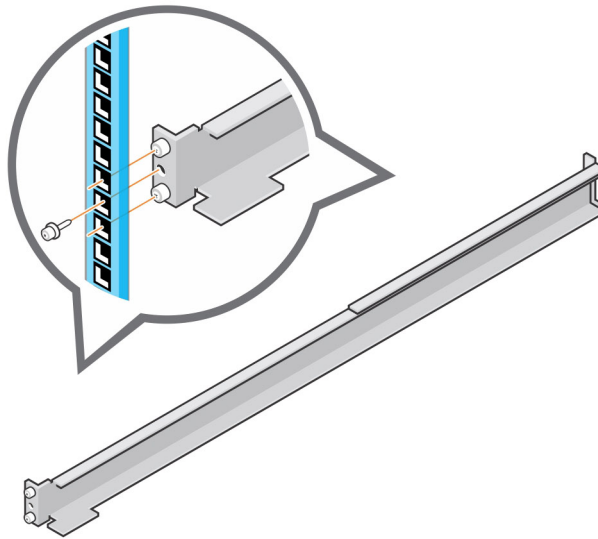
13   Remove the rails from the rack.

Figure 56. Remove Rails from the Rack

Install the Cable Management Tray

Installation of the 1U cable management tray must be performed during a scheduled maintenance window when the Storage Center system is unavailable to the network.

Steps

1 If the expansion enclosure rails are installed, push in the blue tab on the rails before installing the 1U cable management tray.
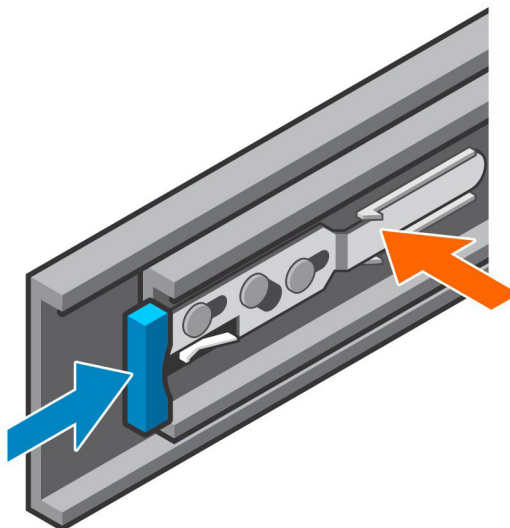

Figure 57. Push in Blue Tab on Expansion Enclosure Rails

2 Align the rails so that the UP arrow is pointed in the correct direction and the end of the rail labeled FRONT is at the front of the rack.

3 Insert the alignment pins of left and right rails into the mounting holes at the front and back of the rack.

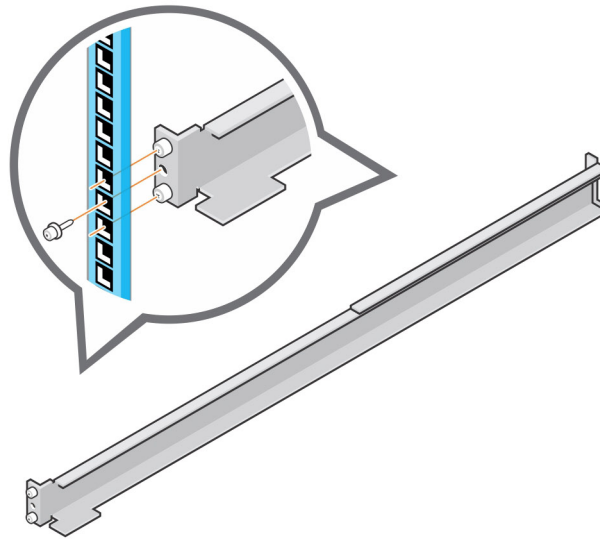4 Secure the rails by installing 8-32 x 0.75 in. screws into the holes at the front and back of the rails.

Figure 58. Secure Rails to Rack

5   Align the 1U cable management tray so that the UP arrow is pointed in the correct direction and the side of the tray labeled FRONT is to the front of the rack
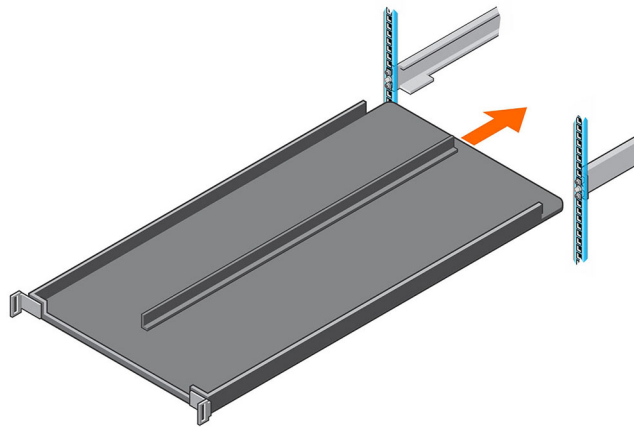

Figure 59. Slide Tray into the Rails

6   Slide the tray into the rails until it locks into place.

7   Prepare the cable chains and route the cables through the cable chains.

ⓘ **NOTE: Label the cables before routing them through the cable chains.**

    a   Align the cable chains so the latches are facing up and the hinges are all facing each other.

    b   Unclip and open all the latches on the cable chains.
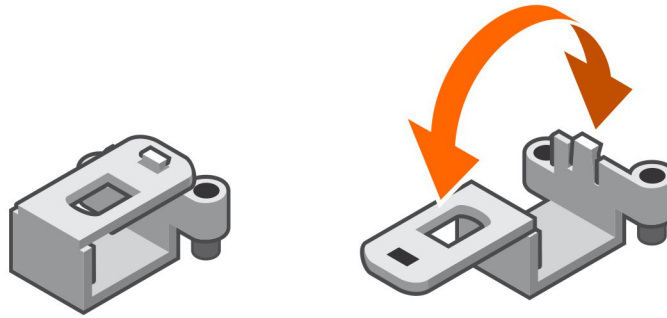
Figure 60. Open the Cable Chain Latches

c Route two power cables and two Mini-SAS HD cables through each cable chain.

d Close the latches and make sure that they are snapped shut.

e Arrange the cable chains to form a "U" shape with the latches facing up.

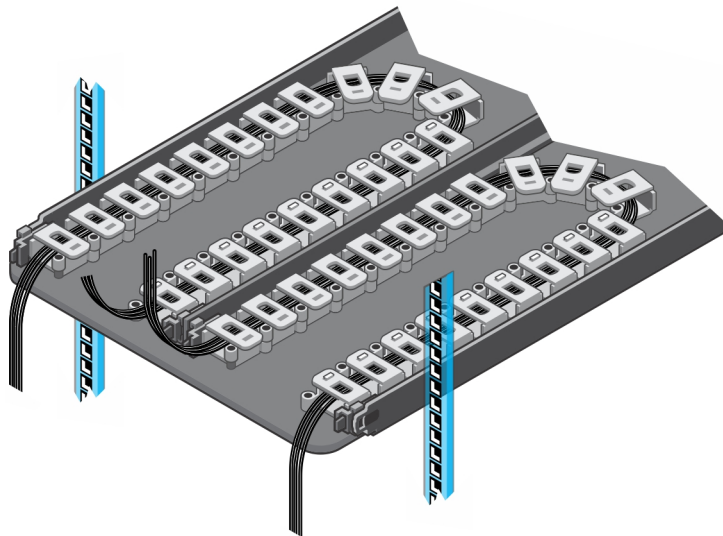f Insert the cable chains through the back side of the tray.

Figure 61. Position the Cable Chains

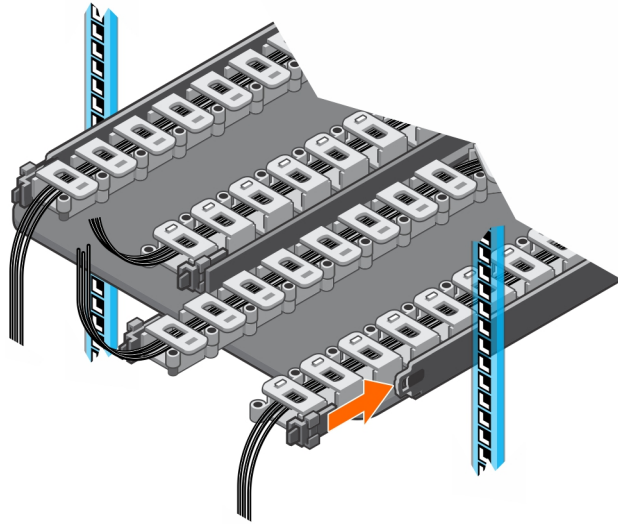8 Attach the clips on the cable chains to the tabs on the back of the 1U cable management tray.

Figure 62. Attach Cable Chains to Tray

9   Install the chassis bracket into the brackets on the side of the chassis.
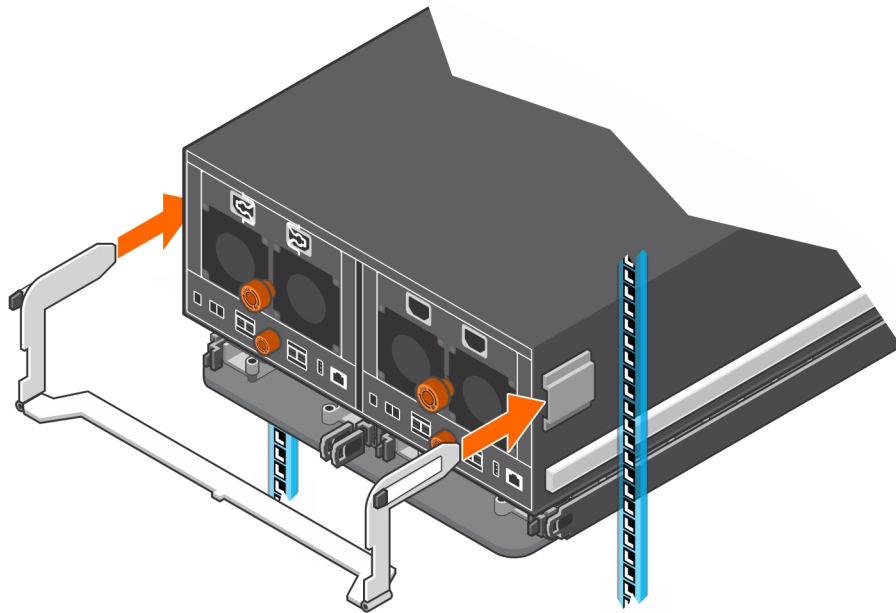

Figure 63. Install the Chassis Bracket to the Chassis

10   Attach the clips on free end of the cable chains to the center flange on the chassis bracket.
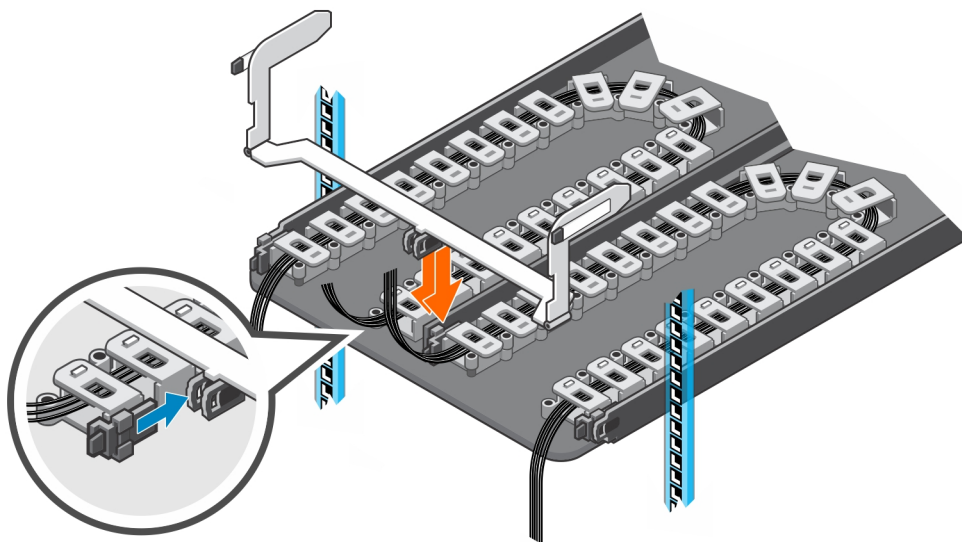
11 Place the bezel over the front of the tray by pressing the release buttons on the bezel and placing it over the retaining slots on the tray.
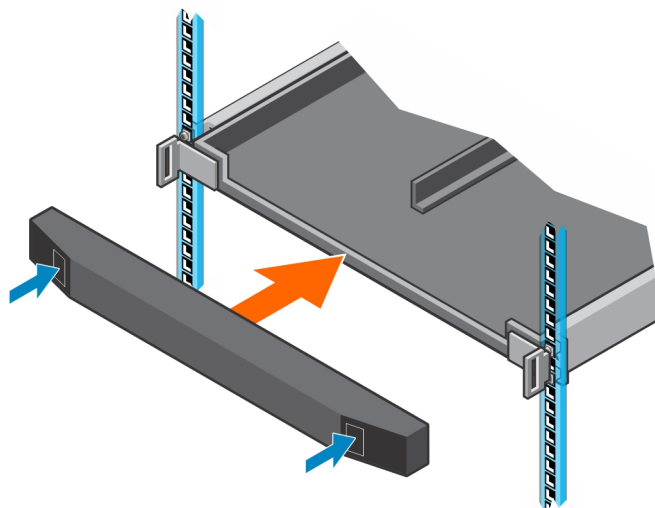

Figure 65. Install the Front Bezel

12 Connect the power cables and Mini-SAS HD cables to the expansion enclosure.

Next steps

1 Power on the expansion enclosure and storage system.
2 Change the operation mode of the Storage Center to Normal.
3 Use SupportAssist to send diagnostic data to technical support.

Cable Management Arms

The SC460 expansion enclosure supports cable management arms in racks with a depth of 1200 mm (47.2 in.).

The cable management arms attach to the back of the expansion enclosure chassis and the rack rails.

Remove the Cable Management Arms

Removal of the cable management arms must be performed during a scheduled maintenance window when the Storage Center system is unavailable to the network.

Prerequisites

1   Use SupportAssist to send diagnostic data to technical support.
2   Change the operation mode of the Storage Center to Maintenance.
3   Use Storage Manager to shut down the storage system connected to the expansion enclosure.

Steps

1   Make sure all the cables are labeled.
2   Disconnect the power cables and the Mini-SAS HD cables from the expansion enclosure
3   Open the cable management arms.
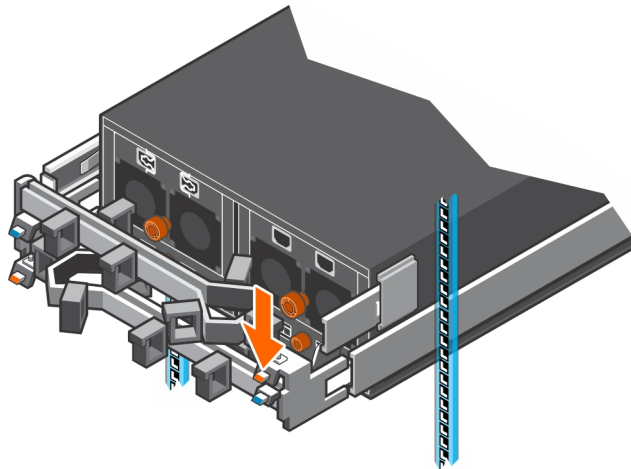   a   Press down on the orange release tab on the right side of the chassis.

Figure 66. Press Orange Release Tab

   b   Pull the upper arm away from the right side of the chassis.
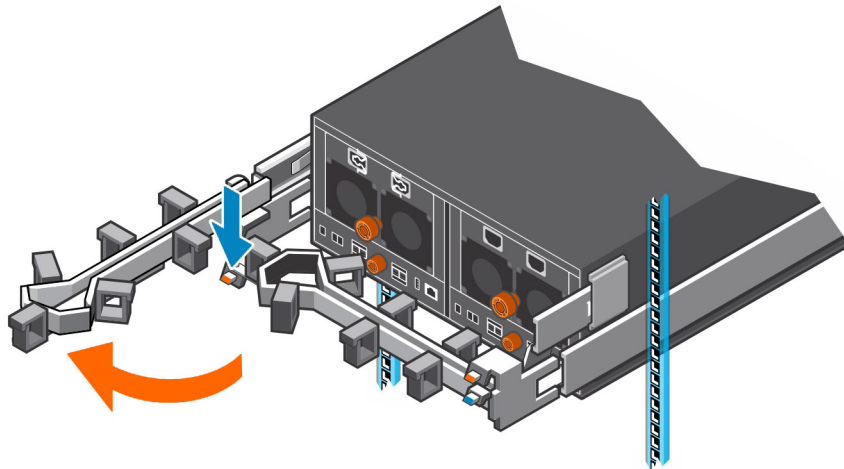
Figure 67. Pull Upper Arm Away from Chassis

   c   Press down on the orange release tab on the left side of the chassis.

   d   Pull the lower arm away from the left side of the chassis.
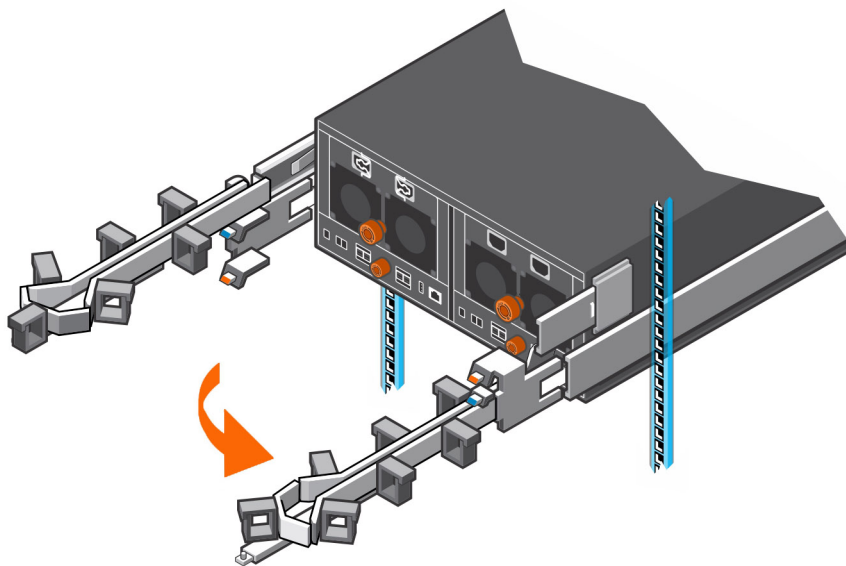
Figure 68. Pull Lower Arm Away from Chassis

4   Remove the power cables and the Mini-SAS HD cables from the cable management arms

   a   Open the plastic brackets on the cable management arm.

   b   Remove the cables from the plastic brackets.

   c   Close the plastic brackets on the cable management arm.

5   Remove the lower cable management arm.

   a   Press down on the blue release tab, and disconnect the extension arm from the rail bracket.

Figure 69. Disconnect Extension Arm from Rail Bracket

b Press the tab on the cable management arm, and disconnect the arm from the bracket.

Figure 70. Disconnect Cable Management Arm from Bracket

6   Remove the upper cable management arm.
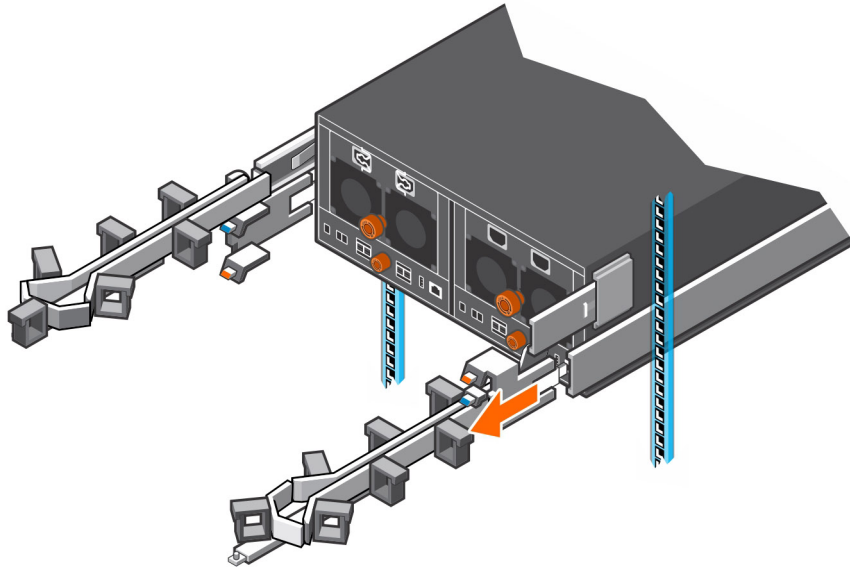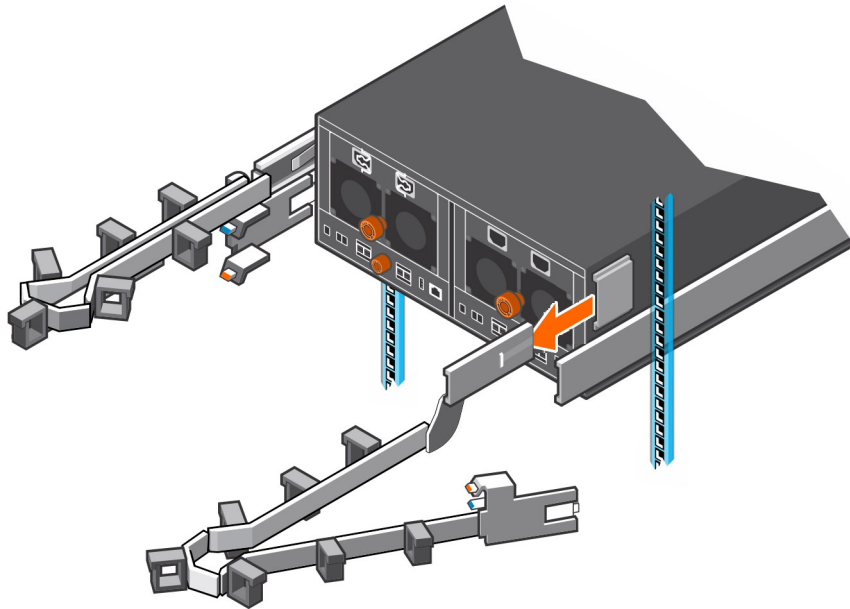   a   Press down on the blue release tab, and disconnect the extension arm from the rail bracket.
    b   Press the tab on the cable management arm, and disconnect the arm from the bracket.

Install the Cable Management Arms

Installation of the cable management arms must be performed during a scheduled maintenance window when the Storage Center system is unavailable to the network.

About this task

Install the cable management arms into a rack with a depth of 1200 mm (47.2 in.).

Steps

1 Align the retention latch end of the cable management arm with the bracket on the expansion enclosure .

2 Insert the cable management arm into the bracket until you hear an audible click.

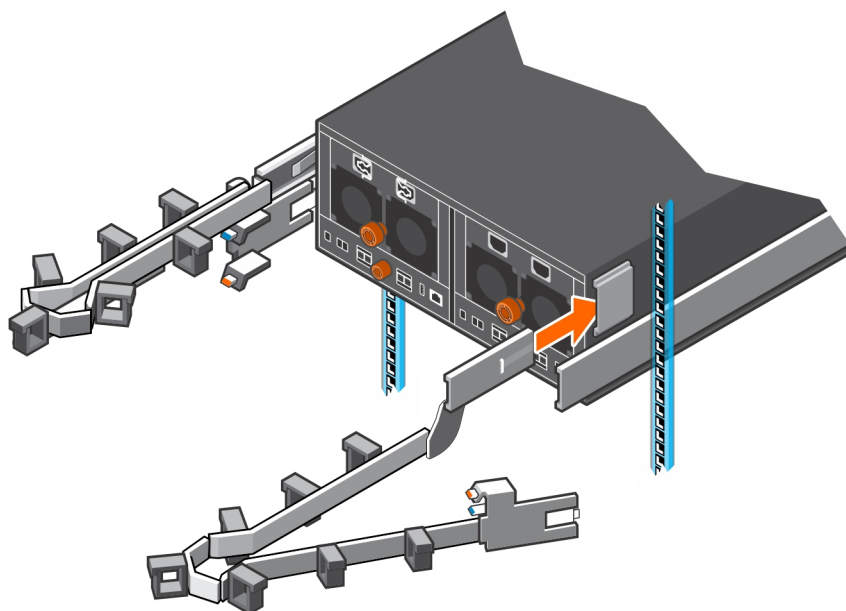 The audible click indicates that the cable management arm is secure.

Figure 71. Installing Cable Management Arms

3 Swing the extension arm into alignment with the rail bracket.
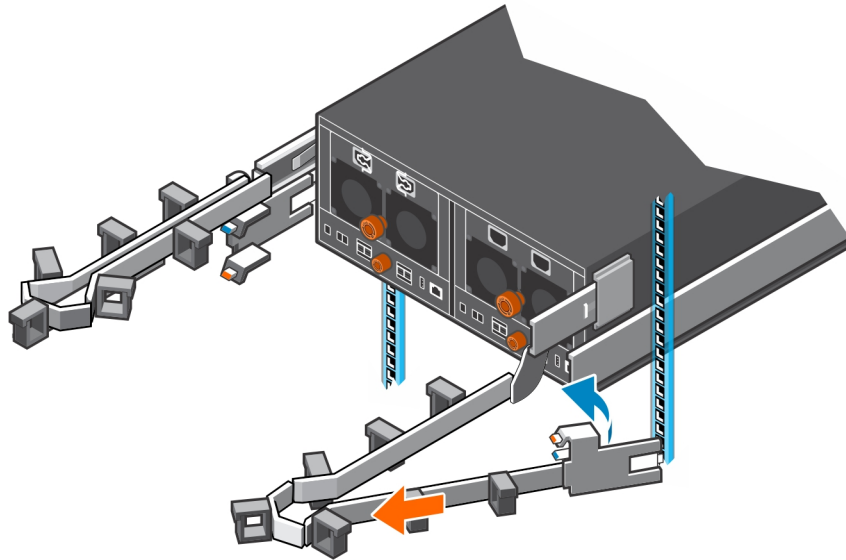
Figure 72. Align Extension Arm with Rail Bracket

4   Push the extension arm into the rail bracket until you hear an audible click.

The audible click indicates that the cable management arm is secure.
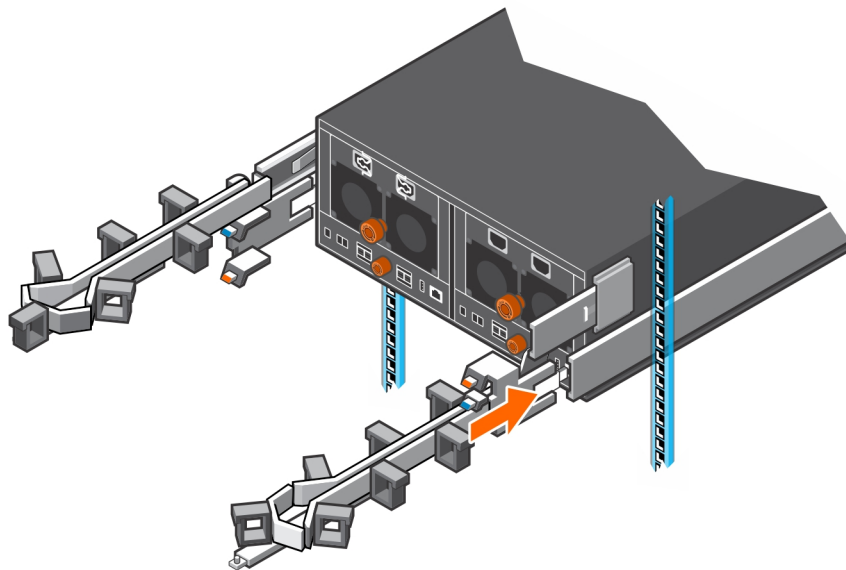
Figure 73. Insert Extension Arm into Rail Bracket

5   Repeat the previous steps for the second cable management arm.
6   Route the cables though the cable management arms.

ⓘ NOTE: Label all the cables before routing them through the cable management arms.

   a   Open the plastic brackets on the cable management arm.
   b   Route the power cables and the Mini-SAS HD cables through the plastic brackets.
   c   Close the plastic brackets on the cable management arm.

7   Close the cable management arms.

   a   Swing the lower arm back and to the left side of the chassis.
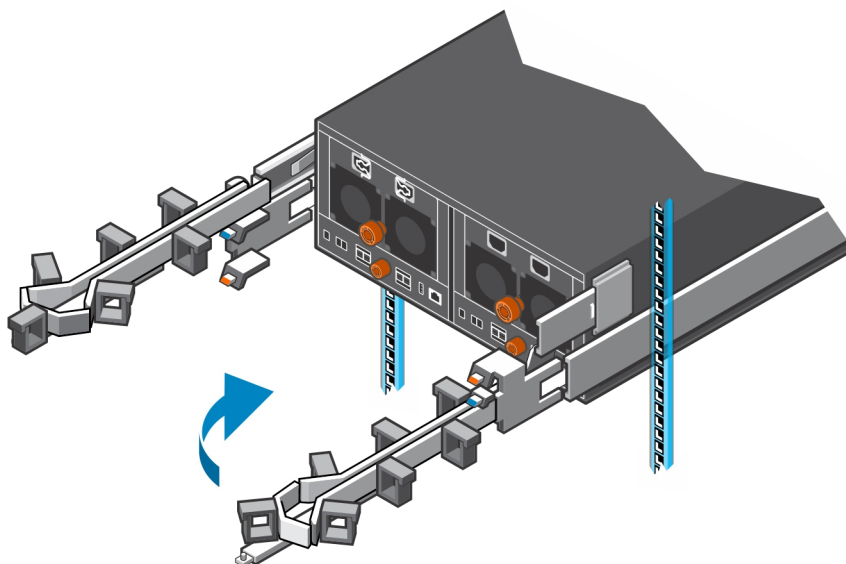
Figure 74. Swing Lower Arm to Left Side of Chassis

   b   Swing the upper arm back and to the right side of the chassis.

   c   Align the securing tab on the right end of the lower arm with the notch over the orange release tab.

   d   Press the tab into the slot until you hear a click.

      The click indicates that the arm is secure.
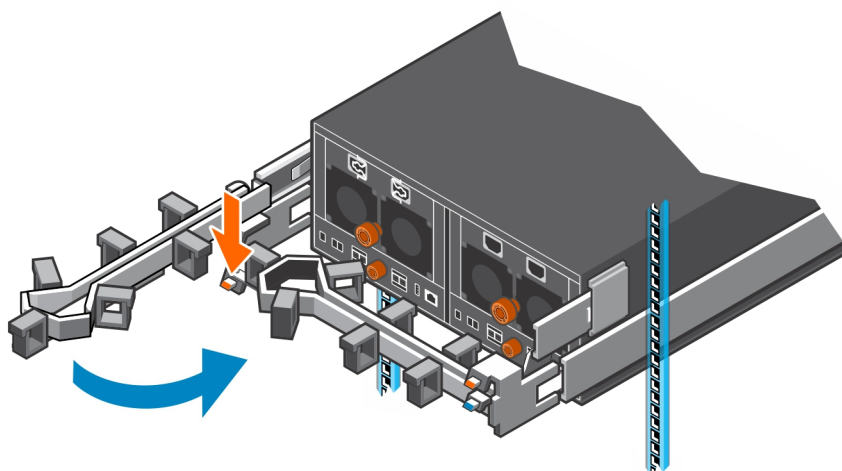
Figure 75. Swing Upper Arm to Right Side of Chassis and Secure Lower Arm

   e   Align the securing tab on the left end of the upper arm with the notch over the orange release tab.

   f   Press the tab into the slot until you hear a click.

      The click indicates that the arm is secure.
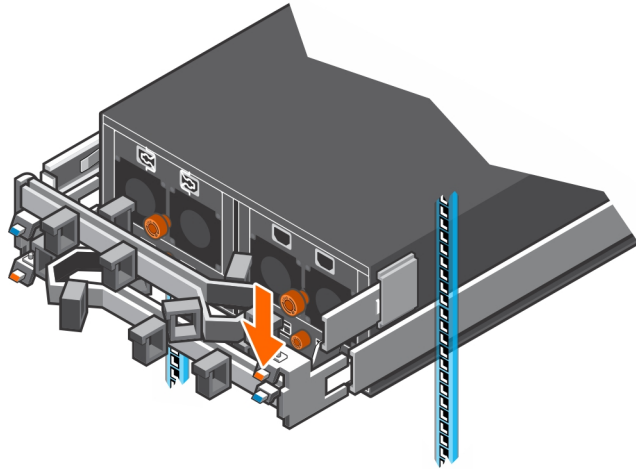
Figure 76. Secure Cable Management Arm

8   Verify that the cable management arms are attached at the securing tabs.

Figure 77. Verify that Cable Management Arms are Secure

9   Connect the power cables and the Mini-SAS HD cables to the expansion enclosure.

Next steps

1   Power on the expansion enclosure and storage system.
2   Change the operation mode of the Storage Center to Normal.
3   Use SupportAssist to send diagnostic data to technical support.

Expansion Enclosure Rack Rails

The SC460 expansion enclosure is mounted in a rack using rack rails.

If the rack rails are damaged, they must be replaced.

Remove the Expansion Enclosure Rails

Removal of the expansion enclosure rails must be performed during a scheduled maintenance window when the Storage Center system is unavailable to the network.

Prerequisites

1   Use SupportAssist to send diagnostic data to technical support.

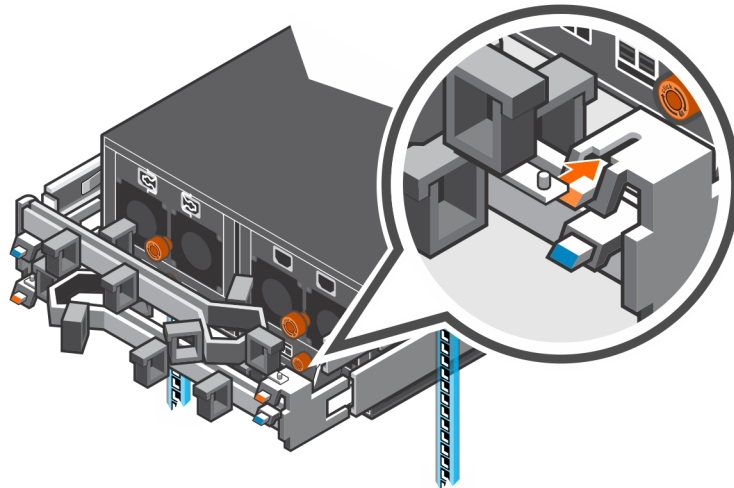2   Change the operation mode of the Storage Center to Maintenance.

3   Use Storage Manager to shut down the storage system connected to the expansion enclosure.

Steps

1   Make sure all the cables are labeled.

2   Disconnect the power cables and Mini-SAS HD cables from the expansion enclosure

3   Remove the screws that secure the chassis to the rack.

4   Remove the expansion enclosure from the rack rails.

> ⚠ **WARNING: Do not attempt to the lift the expansion enclosure by yourself. Always have assistance when lifting the expansion enclosure. If installed above the lower 20U of a rack, a customer-provided mechanical lift must be used to avoid injury.**

5   Remove the rack rails from the rack.

Install the Expansion Enclosure Rails

Installation of the expansion enclosure rails must be performed during a scheduled maintenance window when the Storage Center system is unavailable to the network.

Steps

1   If necessary, adjust the length of the expansion enclosure rails to fit the rack.

2   Attach the right rail to the back post of the rack.

    a   Align the right rail with the lower two U spaces of the 4U mounting location.

    b   With the release latch on the outer part of the rack post, place the catch mechanism over the post.

    c   Push the rail back to secure the rail to the rack post.

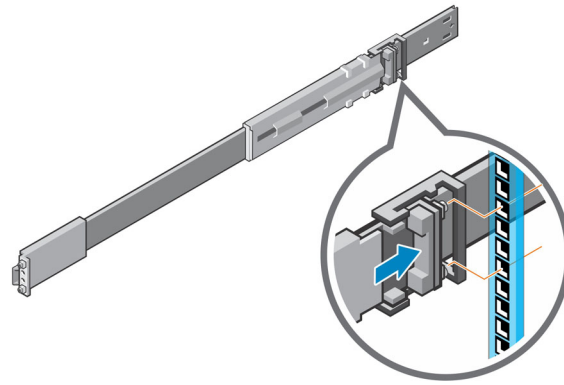   An audible click indicates that the rail is secure in the post.

Figure 78. Attach Rail to the Back of the Rack

3   Attach the right rail to the front post of the rack.

    a   Align the right rail with the lower two U spaces of the 4U mounting location.

    b   Pull the rail forward, with the alignment pins in the middle holes of the bottom two U spaces of the 4U mounting location.

          An audible click indicates that the rail is secure in the post.
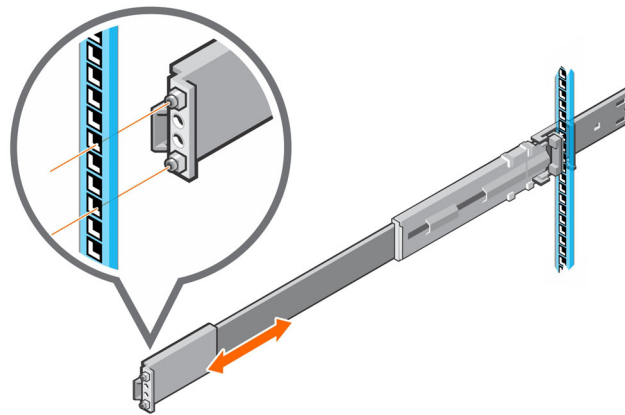
Figure 79. Attach Rail to the Front of the Rack

4   Repeat the previous steps to install the left rail.

5   Mount the expansion enclosure on the rails.

6   Connect the power cables and Mini-SAS HD cables to the expansion enclosure.

Next steps

1   Power on the expansion enclosure and storage system.

2   Change the operation mode of the Storage Center to Normal.

3   Use SupportAssist to send diagnostic data to technical support.

Post-Replacement Procedures

After replacing a component in the SC460 expansion enclosure, start up the SC9000, SC7020, and SC5020 storage systems and the SC460 expansion enclosures if they were previously shut down, then use SupportAssist to send diagnostic data to technical support.

Start Up the Storage System and Expansion Enclosure

If the storage system and expansion enclosure were previously shut down, perform this procedure to start them up.

1   Power on the expansion enclosure by plugging the power cables into the PSUs.

   ⓘ **NOTE: Wait approximately three minutes for the drives in the expansion enclosure to spin up before powering on the storage system.**

2   Plug the power cables into the power supply/cooling fan modules of the storage system.
3   Power on the storage system by pressing the power switches on both power supply/cooling fan modules to the ON position.
4   Use the Storage Manager to make sure the replacement part is recognized and shown as up and running.

Send Diagnostic Data Using SupportAssist

After replacing components, use SupportAssist to send diagnostic data to technical support.

1   Use Storage Managerto connect to the Storage Center.
2   In the **Summary** tab, click **Send SupportAssist Information Now**, which is located under **SupportAssist Actions** in the **Status** pane. The **Send SupportAssist Information Now** dialog box opens.
3   Select **Storage Center Configuration** and **Detailed Logs**.
4   Click **OK**.

Change the Operation Mode of the Storage Center to Normal or Production

Change the operation mode of the Storage Center to Normal or Production after replacing components.

1   Use Storage Manager to connect to the Storage Center.
2   In the **Summary** tab, click **Edit Settings**. The **Edit Storage Center Settings** dialog box opens.
3   Click the **General** tab.
4   Select **Normal** or **Production** from the **Operation Mode** drop-down menu.
5   Click **OK**.

SC460 Expansion Enclosure Technical Specifications

This appendix contains the technical specifications for the SC460 expansion enclosure.

Technical Specifications

The technical specifications of the SC460 expansion enclosure are displayed in the following tables.

Drives

SAS hard drives	Dell Enterprise Plus drives Up to 60 hot-swappable 7.2K RPM 12 Gbps 3.5" SAS hard drives

Connectivity

Configurations	SC9000, SC7020, and SC5020 storage systems support up to three SC460 expansion enclosures per SAS chain

Enclosure Management Modules (EMMs)

EMMs	Two hot-swappable EMMs with four 12 Gb SAS ports per EMM. The expansion enclosure supports Mini-SAS HD cables in lengths of 3 m, 4 m, and 5 m.
SAS connectors	SAS connectors are SFF-8644 compliant

Power Supplies

Wattage	1600 W per power supply

AC Power

Input voltage	200–240 VAC
Input frequency	50/60 Hz
Input current	4.5 A x2 (N+1)

Physical

Height (4U chassis)	17.5 cm (6.89 in.)
Height (4U chassis plus 1U cable management tray)	22.23 cm (8.75 in.)
Width (including rails)	44.45 cm (17.50 in.)
Depth (chassis only)	87.63 cm (34.5 in.)
Maximum depth (fully configured)	92.46 cm (36.4 in.)
Weight (maximum configuration)	102.05 kg (225.0 lb)

Environmental

Temperature

Operating	5° to 40°C (41° to 104°F) with a maximum temperature gradation of 10°C per hour
Storage	-40° to 65°C (-40° to 149°F) with a maximum temperature gradation of 25°C per hour

Relative humidity

Operating	20% to 80% (noncondensing)
Storage	10% to 90% (noncondensing)

Altitude

Operating	-16 to 2300 m (-50 to 7500 ft)
Storage	-16 to 10,600 m (-50 to 35,000 ft)