Dell PowerStore

Installation and Service Guide for PowerStore 1000, 1200, 3000, 3200, 5000, 5200, 7000, 9000, and 9200

Version 4.x

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DELL Technologies

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

Preface

As part of an improvement effort, revisions of the software and hardware are periodically released. Some functions that are described in this document are not supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information about product features. Contact your service provider if a product does not function properly or does not function as described in this document.

NOTE: PowerStore X model customers: For the latest how-to technical manuals and guides for your model, download the *PowerStore 3.2.x Documentation Set* from the PowerStore Documentation page at dell.com/powerstoredocs.

Where to get help

Support, product, and licensing information can be obtained as follows:

- **Product information**—For product and feature documentation or release notes, go to the PowerStore Documentation page at dell.com/powerstoredocs.
- **Troubleshooting**—For information about products, software updates, licensing, and service go to Dell Support and locate the appropriate product support page.
- **Technical support**—For technical support and service requests, go to Dell Support and locate the **Service Requests** page. To open a service request, you must have a valid support agreement. Contact your Sales Representative for details about obtaining a valid support agreement or to answer any questions about your account.

1

Install a new base enclosure and an optional expansion enclosure

Follow these procedures to add a new base enclosure and an optional expansion enclosure to the system. For a detailed overview of these components, see the *PowerStore Hardware Information Guide*.

NOTE: Review the information in Safety precautions for handling replaceable units before handling parts.

Topics:

Installation power overview

Follow these guidelines for when to power on your system during various installation scenarios.

Table 1. Installing expansion enclosures during the initial system installation

Installation Scenario	Order of Operations
Installing only a base enclosure	1. Install the base enclosure. 2. Plug in the power cables.
Installing a base enclosure and expansion enclosures	1. Install the base enclosure and expansion enclosures. 2. Cable the expansion enclosures to the base enclosure. 3. Plug in the power cables.

Table 2. Adding expansion enclosures to a running system

Installation Scenario	Order of Operations
Adding the first expansion enclosure	1. Install the expansion enclosure. 2. Cable the expansion enclosures to the base enclosure. 3. Plug in the power cables.
Adding a second expansion enclosure	1. Install the expansion enclosure. 2. Plug in the power cables. 3. Move the loopback cables and then add two new cables.
Adding a third expansion enclosure	1. Install the expansion enclosure. 2. Plug in the power cables. 3. Move loopback cables and then add two new cables.

Install a new base enclosure

Take the following actions to install a new base enclosure into a rack.

Choose where to install the base enclosure

Before installing the new base enclosure, determine the placement of the new base enclosure within the rack.

Steps

1. Install the base enclosure in the lowest available 2U space, leaving 2U of space at the bottom of the rack for serviceability. Most cabinets mark 1U increments with horizontal lines or small holes in the channels.
2. If this is the second base enclosure to be installed in the rack, install it directly into the 2U space above the first base enclosure.

   NOTE: For additional rack space considerations, refer to the *PowerStore Planning Guide*.

3. Considering these recommendations, choose a 2U space in the cabinet for the base enclosure.

   NOTE: It is recommended that you include 36 inches of clearance in front of and behind the rack to avoid a system shutdown if maintenance or service activities are required.

Unpack the base enclosure

The base enclosure is a 2U component with 25 2.5" drive slots. Verify that you have received all of the base enclosure components in the shipping package.

NOTE: Before installing the base enclosure, ensure that the hardware has acclimated to the operating environment as described in Hardware acclimation times.

Verify shipping package contents

Confirm that you received all necessary equipment needed to install the new base enclosure.

- Base enclosure - 2U component with 25 2.5" drive slots
- One tool-less rail kit that includes two snap-in rails
- Two security screws
- Power cords: Two AC power cords for AC systems or two DC power cords for DC systems
- One bezel

Install the rails in the cabinet

This task describes the procedure to install one rail. After installing one rail, repeat the procedure for the other rail. The procedure is the same for both the left and right rail. You can install the rails into either a square or round hole rack.

Steps

1. Position the rail end piece so the label FRONT is located at the front of the rack and facing towards the inside of the rack, while orienting the rear of the rail to align level with the holes on the rear of the rack.
2. From the rear of the rack, pull the rail straight back until the latch is locked.
3. To install the frontend piece of the rail, press the blue latch release button until the latch rotates open.
4. Pull the rail forward until the pins slide into the holes on the front of the rack, then release the latch to secure the rail in place.

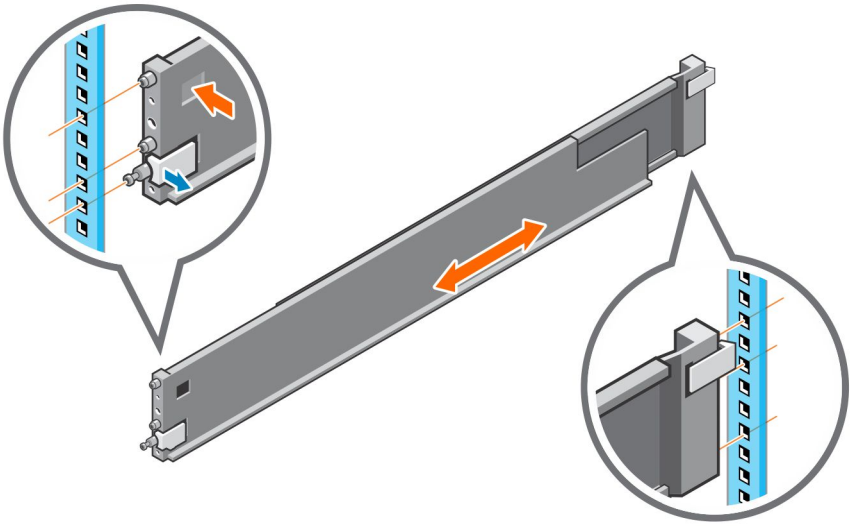


Figure 1. Installing the rails

5. Repeat for the other rail.
6. The rail kit ships with two screws for additional security. Install the security screws into the rear of the rails in the screw hole next to the blue spring lock.

   NOTE: You may need a long-handled screwdriver to reach the screw hole.

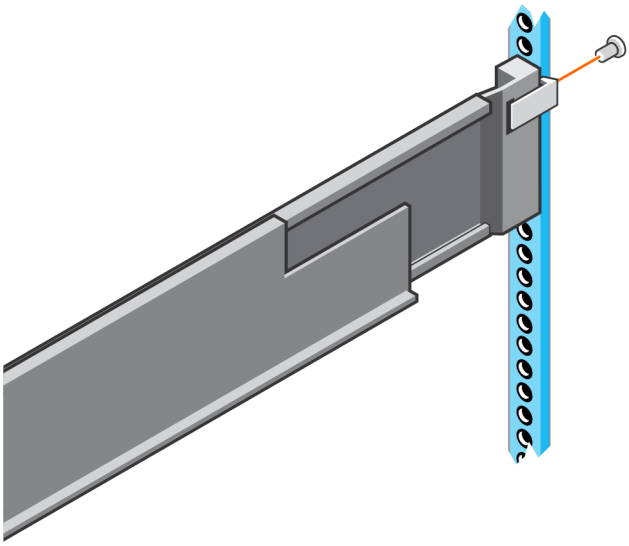


Figure 2. Installing the security screws

Install the base enclosure on the rails

Steps

1. Lift the enclosure and slide it onto the rails from the front of the cabinet.
2. Push the enclosure into the rack until the slam latches engage and lock the enclosure into the rack.

   Ensure that the enclosure is flush with the front of the rack, fully seated in the cabinet, and does not slide out.

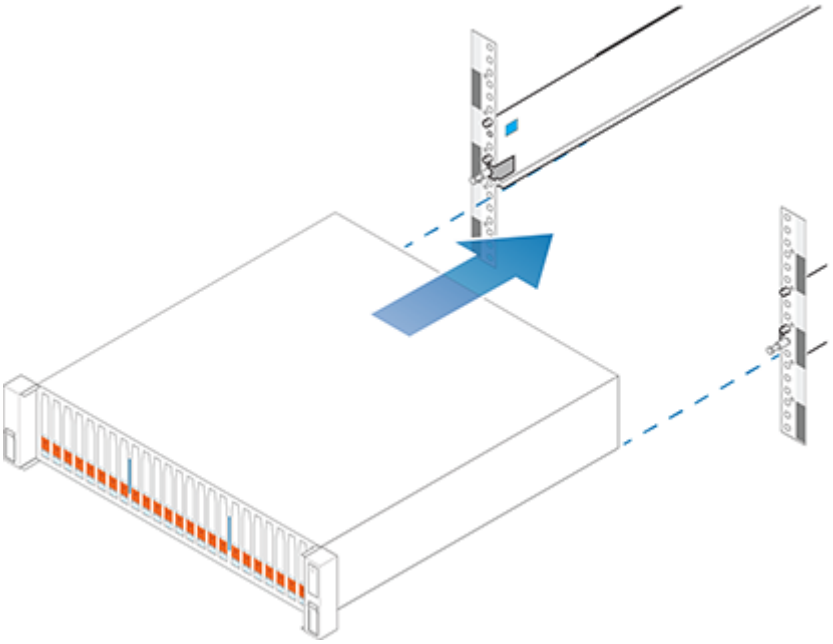


Figure 3. Installing the enclosure

3. The enclosure includes captive screws under the front latches. Locate the captive screw under each latch and tighten to the front of the cabinet using a #1 Philips screwdriver.

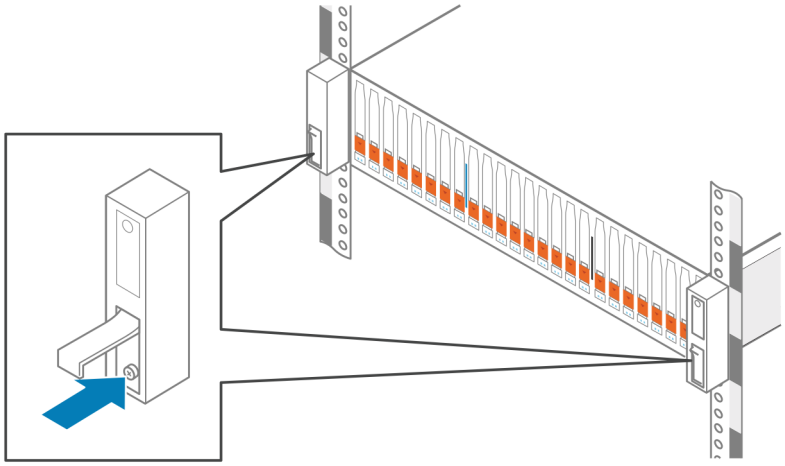


Figure 4. Tightening the captive screws

Cable the base enclosure appliance to switches

For switch cabling information, refer to the *PowerStore Networking Guide for Initial Deployment* .

NOTE: Do not connect the power cables until you have completed network configuration.

Connect power cables

Prerequisites

If you are also installing an expansion enclosure, wait to power on the base enclosure until after you have cabled the expansion enclosure.

Steps

1. Plug each power cable into the base enclosure power supply.

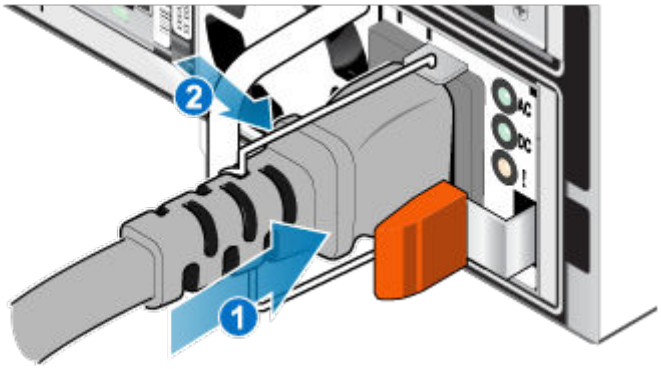


Figure 5. Inserting the power cable

2. Connect the other end of the power cable to the power distribution unit (PDU) on the rack.

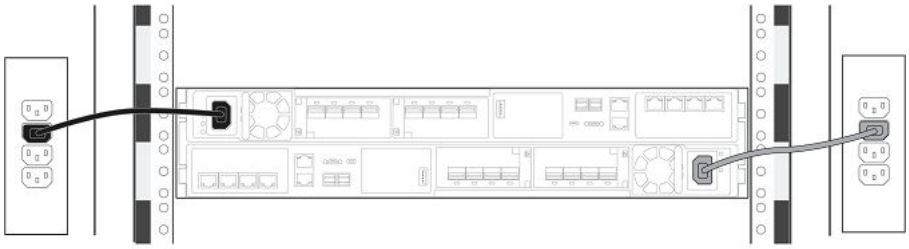


Figure 6. Connecting to the PDU

After you connect the power cables, the base enclosure automatically starts up.

Discover your system

Once you have completed installing your base enclosure and optional expansion enclosures, discover your newly installed enclosure.

Refer to *PowerStore Networking Guide for Initial Deployment* for details.

Upgrade PowerStore software

PowerStore systems come preinstalled with the latest version of PowerStore software that was available at the time of shipment. After installing the PowerStore system, Dell Technologies recommends upgrading the PowerStore software to the latest available version. See the *PowerStore Software Upgrade Guide* for detailed instructions.

Install a SAS expansion enclosure

Take the following actions to install a SAS expansion enclosure into the system during the initial system installation or to install the first SAS expansion enclosure into a running system.

NOTE: During the initial system installation, do not power on the system until you have finished cabling all of the expansion enclosures.

CAUTION: On a running cluster, if you are adding an expansion enclosure after installing the first expansion enclosure during initial system installation, you must power on the new expansion enclosure before attaching the back-end cables. Review Installation power overview before proceeding.

Summary of tasks for installing an expansion enclosure

To install an expansion enclosure, complete the tasks below in the order in which they appear. This document provides instructions for completing each task.

1. Verify the contents of the shipping package.
2. Choose the space in the cabinet for the new expansion enclosure.
3. Remove the filler panels that cover the cabinet space for the new expansion enclosure.
4. Install the rails for the new expansion enclosure in the cabinet.
5. Install the expansion enclosure on the rails.
6. If the new expansion enclosure shipped without its drives installed, install the drives in the expansion enclosure.
7. Install the front bezel on the new expansion enclosure.
8. Apply cable labels.
9. Review Installation power overview.
10. Attach the expansion (back-end) cables, and then attach the power cables.

Verify shipping package contents

Confirm that you received all the equipment that is required to install the new expansion enclosure.

Table 3. Shipping package contents

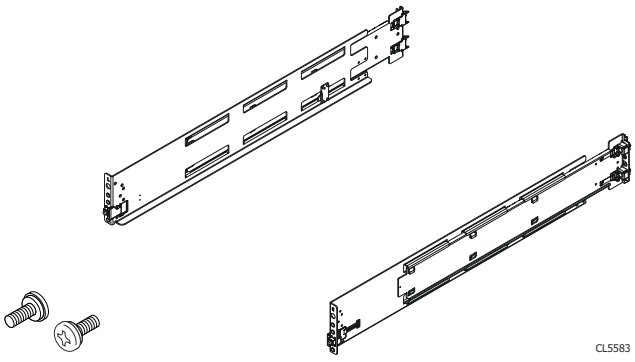
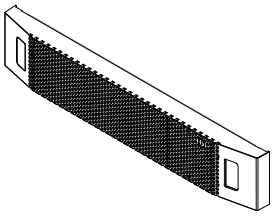
Component		Quantity
Expansion enclosure		1
Rail kit, including Two snap-in rails Two optional security screws		1
Power cords (2), either Black and gray C13/C14 Black and gray C13/C20		2

Table 3. Shipping package contents (continued)

Component		Quantity
Bezel for expansion enclosure (with key)		1
Mini-SAS HD cables (4) (1 m or 2 m copper) to connect the base enclosure to the expansion enclosure, the expansion enclosure to another expansion enclosure, and to loopback from the expansion enclosure to the base enclosure.		2

Choose where to install the expansion enclosure

Before installing the new expansion enclosure, you should determine the placement of the new expansion enclosure within the rack.

Steps

1. It is recommended that you install the expansion enclosure in the next available 2U space directly above the base enclosure or the last expansion enclosure in the system.

   Most cabinets mark 1U increments with horizontal lines or small holes in the channels.
2. Considering these recommendations, choose a 2U space in the cabinet for the expansion enclosure.

Removing a filler panel

About this task

In most cases, the front space into which you will install the enclosure is covered by a filler panel, which is attached to latch brackets. If one or more filler panels cover the space where you want to install the enclosure, remove each panel using the procedure that follows.

Steps

1. Remove the filler panel.
2. Use a flatblade screwdriver or similar tool to pry off the latch brackets (Prying off a latch bracket).

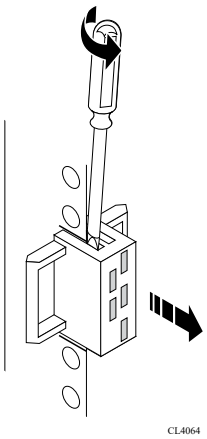


Figure 7. Prying off a latch bracket

Install the rails in the cabinet

This task describes the procedure to install one rail. After installing one rail, repeat the procedure for the other rail. The procedure is the same for both the left and right rail. You can install the rails into either a square or round hole rack.

Steps

1. Position the rail end piece so the label FRONT is located at the front of the rack and facing towards the inside of the rack, while orienting the rear of the rail to align level with the holes on the rear of the rack.
2. From the rear of the rack, pull the rail straight back until the latch is locked.
3. To install the frontend piece of the rail, press the blue latch release button until the latch rotates open.
4. Pull the rail forward until the pins slide into the holes on the front of the rack, then release the latch to secure the rail in place.

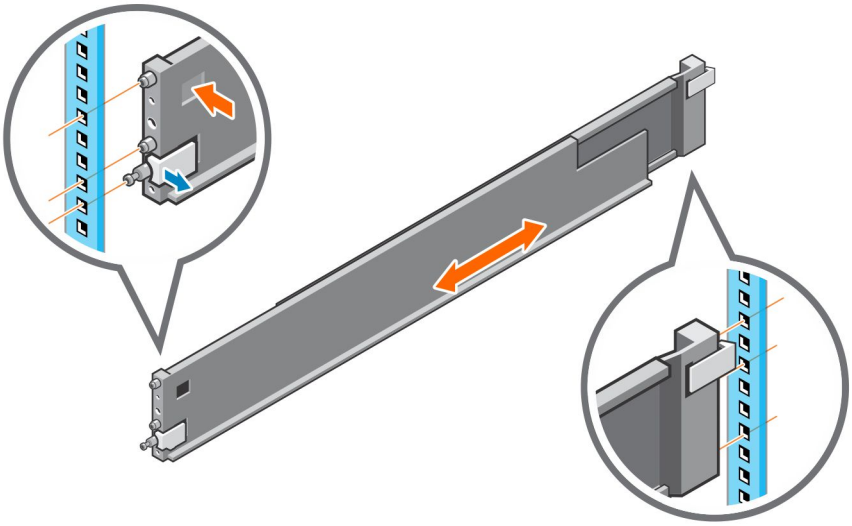


Figure 8. Installing the rails

5. Repeat for the other rail.
6. The rail kit ships with two screws for additional security. Install the security screws into the rear of the rails in the screw hole next to the blue spring lock.

NOTE: You may need a long-handled screwdriver to reach the screw hole.

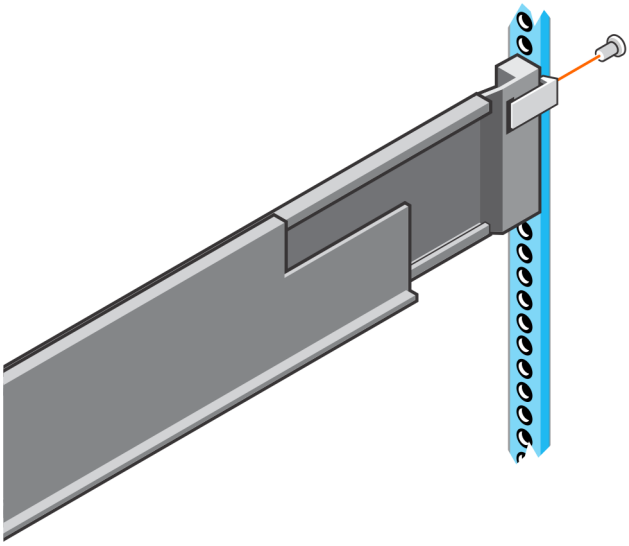


Figure 9. Installing the security screws

Install the base enclosure on the rails

Steps

1. Lift the enclosure and slide it onto the rails from the front of the cabinet.
2. Push the enclosure into the rack until the slam latches engage and lock the enclosure into the rack.
   Ensure that the enclosure is flush with the front of the rack, fully seated in the cabinet, and does not slide out.

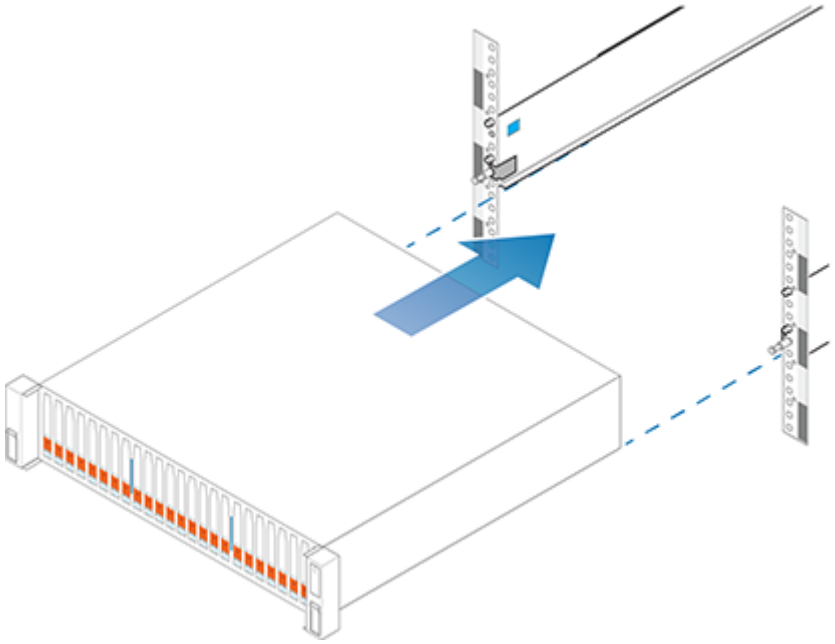


Figure 10. Installing the enclosure

3. The enclosure includes captive screws under the front latches. Locate the captive screw under each latch and tighten to the front of the cabinet using a #1 Philips screwdriver.

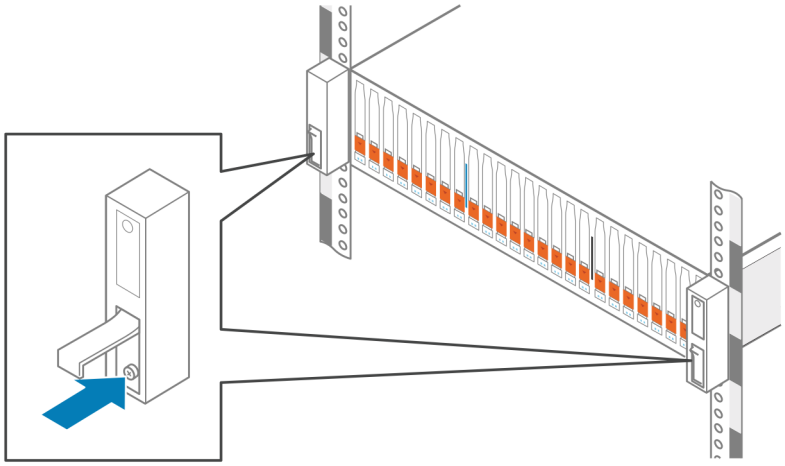


Figure 11. Tightening the captive screws

Installing drives

If the drives shipped separately from the enclosure, install them in the enclosure now. If the drives are already installed in the enclosure, you are ready to install the bezel.

Installing a drive

About this task

NOTE: If you are installing multiple drives in a system that is powered up, wait at least 10 seconds before sliding the next drive into position, but do not exceed 2 minutes. This will allow the system to determine the best RAID width.

NOTE: Drives must be installed from left-to-right starting with the first available slot.

Steps

1. Align the drive with the guides in the slot.
2. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
3. Push the orange button until the drive is fully seated in the slot.
4. Push the latch down until it locks into place.

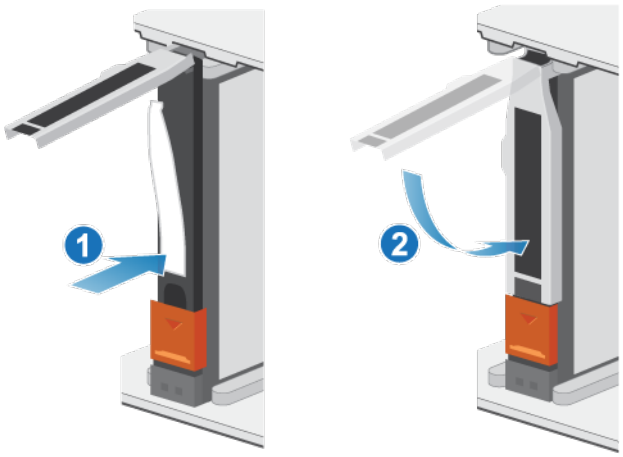


Figure 12. Installing a drive

The activity light flashes to indicate that the spin-up sequence has begun.

Installing the front bezel

Prerequisites

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

About this task

Refer to Installing the bezel while performing the procedure that follows.

Steps

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.

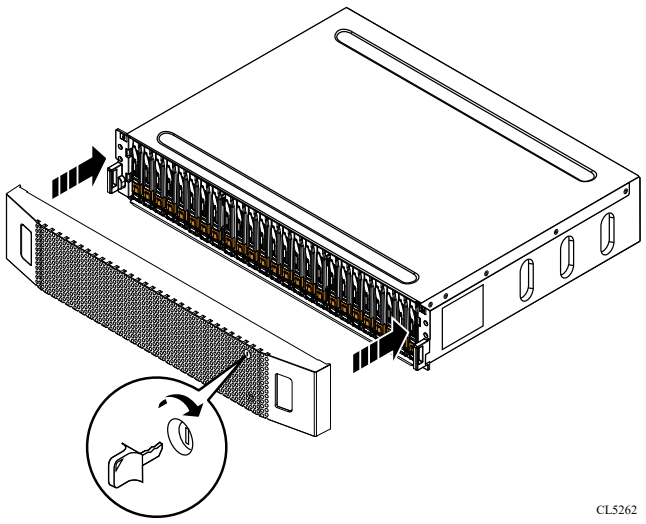


Figure 13. Installing the bezel

Cable the base enclosure to the expansion enclosure

Follow these guidelines to cable the base enclosure to an expansion enclosure.

Prerequisites

NOTE: One cabinet requires four SAS cables, two cabinets requires six SAS cables, and three cabinets require eight SAS cables. Verify that you have the correct number of cables before you start.

NOTE: Do not plug any cables into the RJ45 ports.

CAUTION: If you observe incorrect cabling between expansion enclosures or to the base enclosure, do not attempt to correct the cable connections. To avoid a potential service disruption, gather support materials and contact your service provider for guidance.

CAUTION: Incorrect cabling could cause all new drives to be locked.

Apply cable labels at each end of the following cables:

- Node to first expansion enclosure.
- Node to last expansion enclosure.
- Expansion enclosure to expansion enclosure if you are installing more than one.

Steps

1. Cable SAS port B from each node on the base enclosure to the link control card (LCC) on the first expansion enclosure in the stack:
   a. Connect node A, SAS port B to LCC A, port A on the expansion enclosure.
   b. Connect node B, SAS port B to LCC B, port A on the expansion enclosure.
2. Cable SAS port A from each node on the base enclosure to the LCCs on the last expansion enclosure in the stack:
   a. Connect node A, SAS port A to LCC B, port B on the last expansion enclosure.
   b. Connect node B, SAS port A to LCC A, port B on the last expansion enclosure.
3. If you are installing more than one expansion enclosure, cable expansion enclosure to expansion enclosure:
   a. Connect LCC A, port B on the first expansion enclosure to LCC A, port A on the next expansion enclosure.
   b. Connect LCC B, port B on the first expansion enclosure to LCC B, port A on the next expansion enclosure.

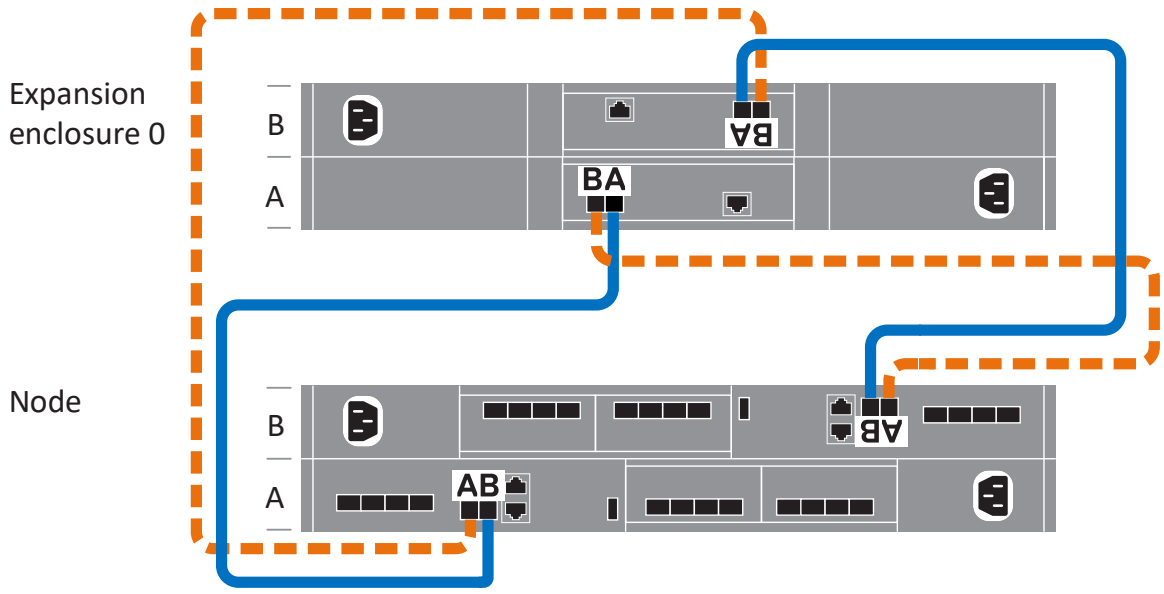


Figure 14. Cabling the base enclosure to one expansion enclosure

NOTE: For additional cabling diagrams, refer to the Cable Label Worksheet.

Connect SAS expansion enclosure power cables

Steps

1. Connect the power cable to the power/cooling module:

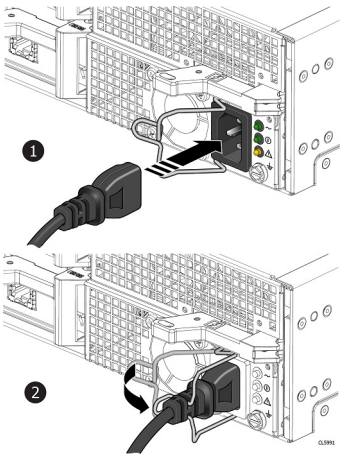


Figure 15. Attaching a power cable

2. Attach the retention bail (strain relief) to the base of the power cable.
   The retention bail prevents the power cable from pulling out of the connection.

Add a SAS expansion enclosure

Take the following actions to add a SAS expansion enclosure to a running system with existing expansion enclosures.

NOTE: If this is the first SAS expansion enclosure, refer to Install an ESS25 expansion enclosure.

Summary of tasks for adding an expansion enclosure

To add an expansion enclosure to a running system, complete the tasks below in the order in which they appear. This document provides instructions for completing each task.

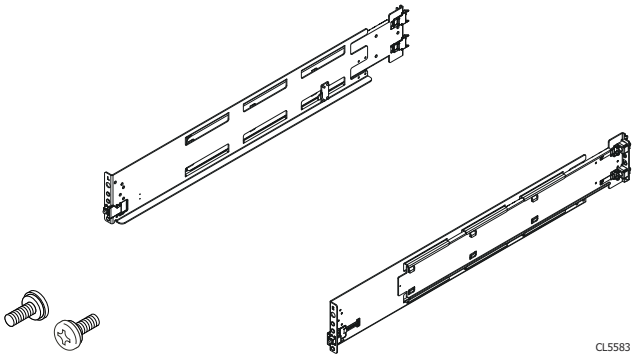
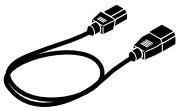
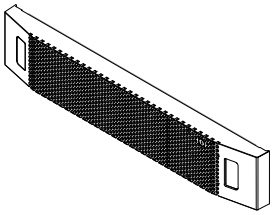
NOTE: When adding an expansion enclosure to a running system, you must power on the expansion enclosure before attaching the back-end cables.

1. Verify the contents of the shipping package.
2. Choose the space in the cabinet for the new expansion enclosure.
3. Remove the filler panels that cover the cabinet space for the new expansion enclosure.
4. Install the rails for the new expansion enclosure in the cabinet.
5. Install the expansion enclosure on the rails.
6. If the new expansion enclosure shipped without its drives installed, install the drives in the expansion enclosure.
7. Install the front bezel on the new expansion enclosure.
8. Attach the power cables to the new expansion enclosure.
9. Attach the expansion (back-end) cables to the new expansion enclosure as described in Cable the new SAS expansion enclosure.
10. Verify the operation of the new expansion enclosure.

Verify shipping package contents

Confirm that you received all the equipment that is required to install the new expansion enclosure.

Table 4. Shipping package contents

Component		Quantity
Expansion enclosure		1
Rail kit, including Two snap-in rails Two optional security screws		1
Power cords (2), either Black and gray C13/C14 Black and gray C13/C20		2
Bezel for expansion enclosure (with key)		1
Mini-SAS HD cables (4) (1 m or 2 m copper) to connect the base enclosure to the expansion enclosure, the expansion enclosure to another expansion enclosure, and to loopback from the expansion enclosure to the base enclosure.		2

Choose where to install the expansion enclosure

Before installing the new expansion enclosure, you should determine the placement of the new expansion enclosure within the rack.

Steps

1. It is recommended that you install the expansion enclosure in the next available 2U space directly above the base enclosure or the last expansion enclosure in the system.

   Most cabinets mark 1U increments with horizontal lines or small holes in the channels.
2. Considering these recommendations, choose a 2U space in the cabinet for the expansion enclosure.

Removing a filler panel

About this task

In most cases, the front space into which you will install the enclosure is covered by a filler panel, which is attached to latch brackets. If one or more filler panels cover the space where you want to install the enclosure, remove each panel using the procedure that follows.

Steps

1. Remove the filler panel.
2. Use a flatblade screwdriver or similar tool to pry off the latch brackets (Prying off a latch bracket).

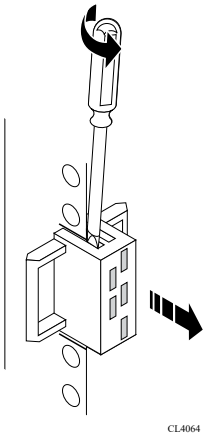


Figure 16. Prying off a latch bracket

Install the rails in the cabinet

This task describes the procedure to install one rail. After installing one rail, repeat the procedure for the other rail. The procedure is the same for both the left and right rail. You can install the rails into either a square or round hole rack.

Steps

1. Position the rail end piece so the label FRONT is located at the front of the rack and facing towards the inside of the rack, while orienting the rear of the rail to align level with the holes on the rear of the rack.
2. From the rear of the rack, pull the rail straight back until the latch is locked.
3. To install the frontend piece of the rail, press the blue latch release button until the latch rotates open.
4. Pull the rail forward until the pins slide into the holes on the front of the rack, then release the latch to secure the rail in place.

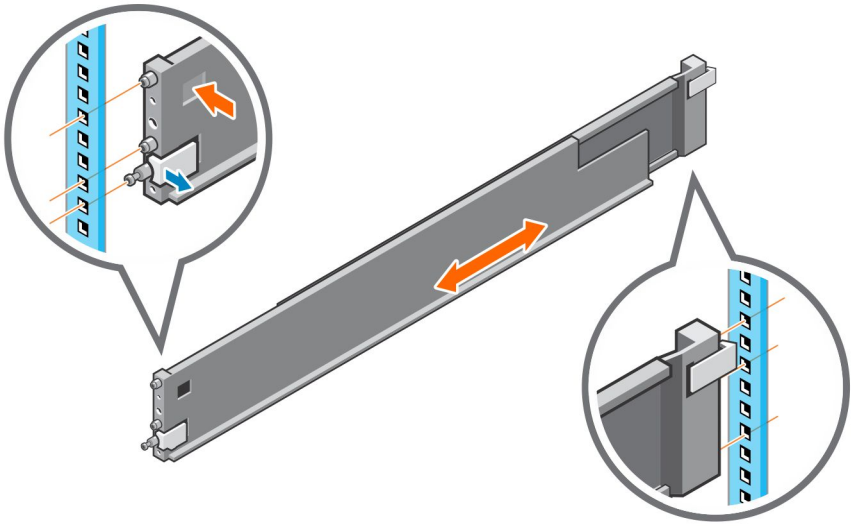


Figure 17. Installing the rails

5. Repeat for the other rail.
6. The rail kit ships with two screws for additional security. Install the security screws into the rear of the rails in the screw hole next to the blue spring lock.

   NOTE: You may need a long-handled screwdriver to reach the screw hole.

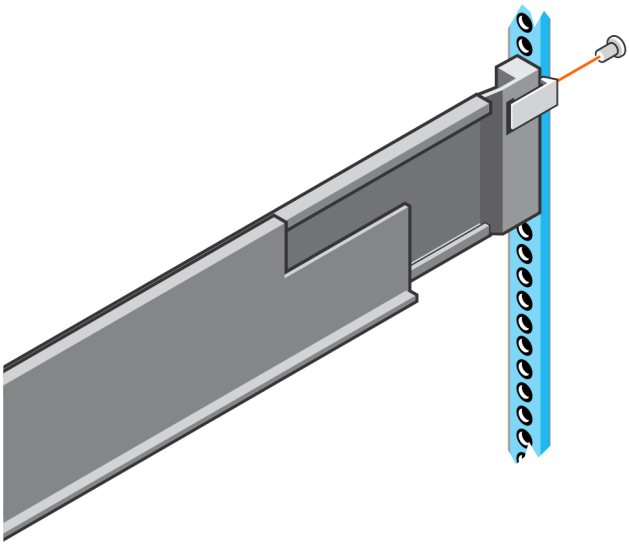


Figure 18. Installing the security screws

Install the expansion enclosure on the rails

Steps

1. With help from another person, lift the expansion enclosure and, from the front of the rack, slide the expansion enclosure onto the rails.
2. Push the expansion enclosure into the rack until the slam latches engage and lock the system into the rack.

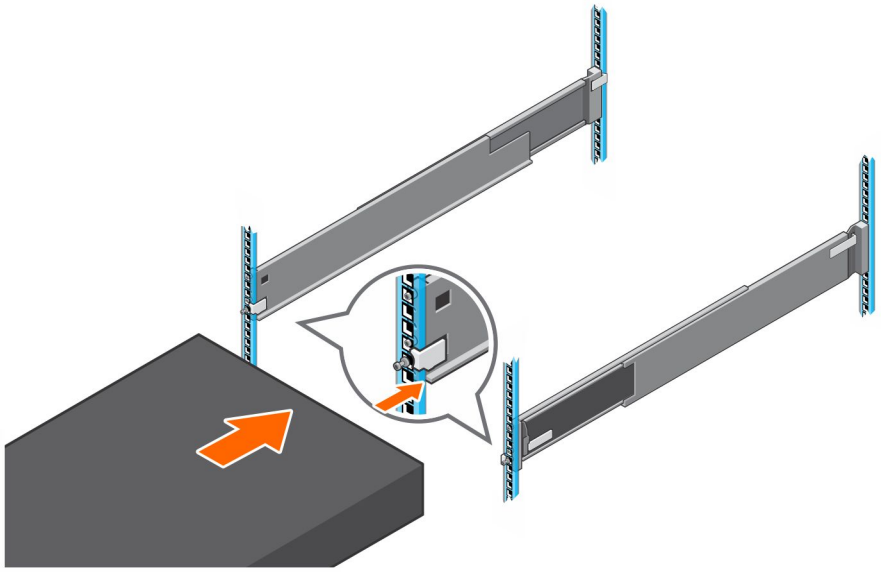


Figure 19. Securing the system in the rack

3. If securing the system for shipment in the rack or in other unstable environments, locate the hard mount captive screw under each latch and tighten using a #2 Phillips screwdriver.

Installing drives

If the drives shipped separately from the enclosure, install them in the enclosure now. If the drives are already installed in the enclosure, you are ready to install the bezel.

Installing a drive

About this task

NOTE: If you are installing multiple drives in a system that is powered up, wait at least 10 seconds before sliding the next drive into position, but do not exceed 2 minutes. This will allow the system to determine the best RAID width.

NOTE: Drives must be installed from left-to-right starting with the first available slot.

Steps

1. Align the drive with the guides in the slot.
2. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
3. Push the orange button until the drive is fully seated in the slot.
4. Push the latch down until it locks into place.

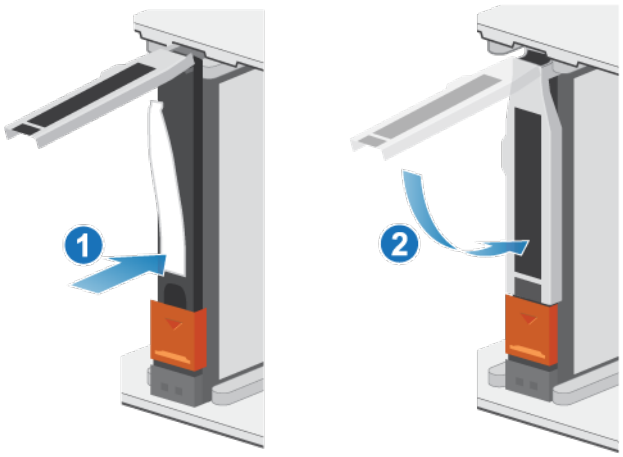


Figure 20. Installing a drive

The activity light flashes to indicate that the spin-up sequence has begun.

Installing the front bezel

Prerequisites

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

About this task

Refer to Installing the bezel while performing the procedure that follows.

Steps

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.

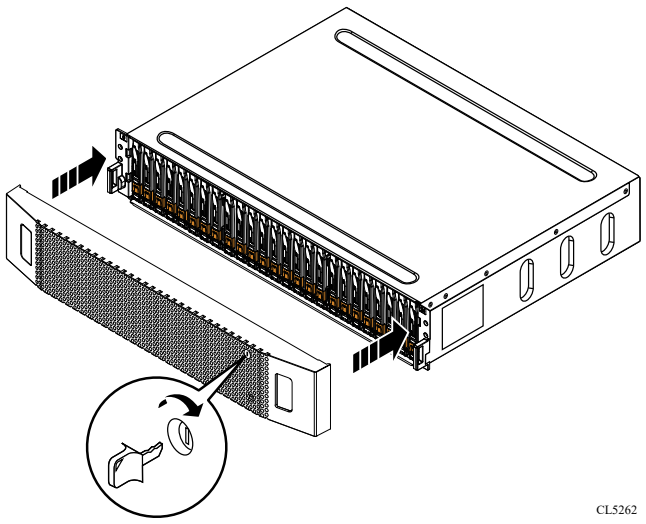


Figure 21. Installing the bezel

Connect SAS expansion enclosure power cables

Steps

1. Connect the power cable to the power/cooling module:

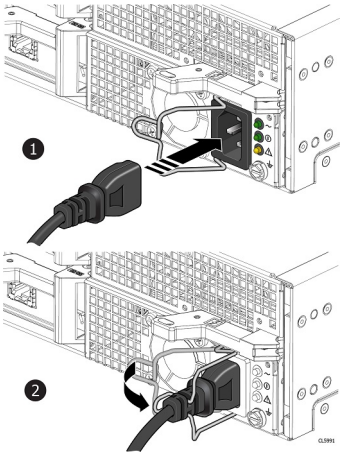


Figure 22. Attaching a power cable

2. Attach the retention bail (strain relief) to the base of the power cable.
   The retention bail prevents the power cable from pulling out of the connection.

Cable the new SAS expansion enclosure

Follow these guidelines to cable an expansion enclosure in a running system to a new expansion enclosure.

Prerequisites

Apply cable labels to the cables connecting the expansion enclosures. In this procedure, "last expansion enclosure" refers to the last expansion enclosure that is currently installed. The "new expansion enclosure" refers to the expansion enclosure that you are adding in this procedure.

NOTE: One cabinet requires four SAS cables, two cabinets requires six SAS cables, and three cabinets require eight SAS cables. Verify that you have the correct number of cables before you start.

NOTE: Do not plug any cables into the RJ45 ports.

CAUTION: If you observe incorrect cabling between expansion enclosures or to the base enclosure, do not attempt to correct the cable connections. To avoid a potential service disruption, gather support materials and contact your service provider for guidance.

CAUTION: Incorrect cabling could cause all new drives to be locked.

Steps

1. Disconnect the SAS cable from LCC B, port B of the last expansion enclosure and move it to LCC B, port B of the new expansion enclosure.
2. Disconnect the SAS cable from LCC A, port B of the last expansion enclosure and move it to LCC A, port B of the new expansion enclosure.
3. Use a new SAS cable to connect LCC A, port B of the last expansion enclosure to LCC A, port A of the new expansion enclosure.
4. Use a new SAS cable to connect LCC B, port B of the last expansion enclosure to LCC B, port A of the new expansion enclosure.

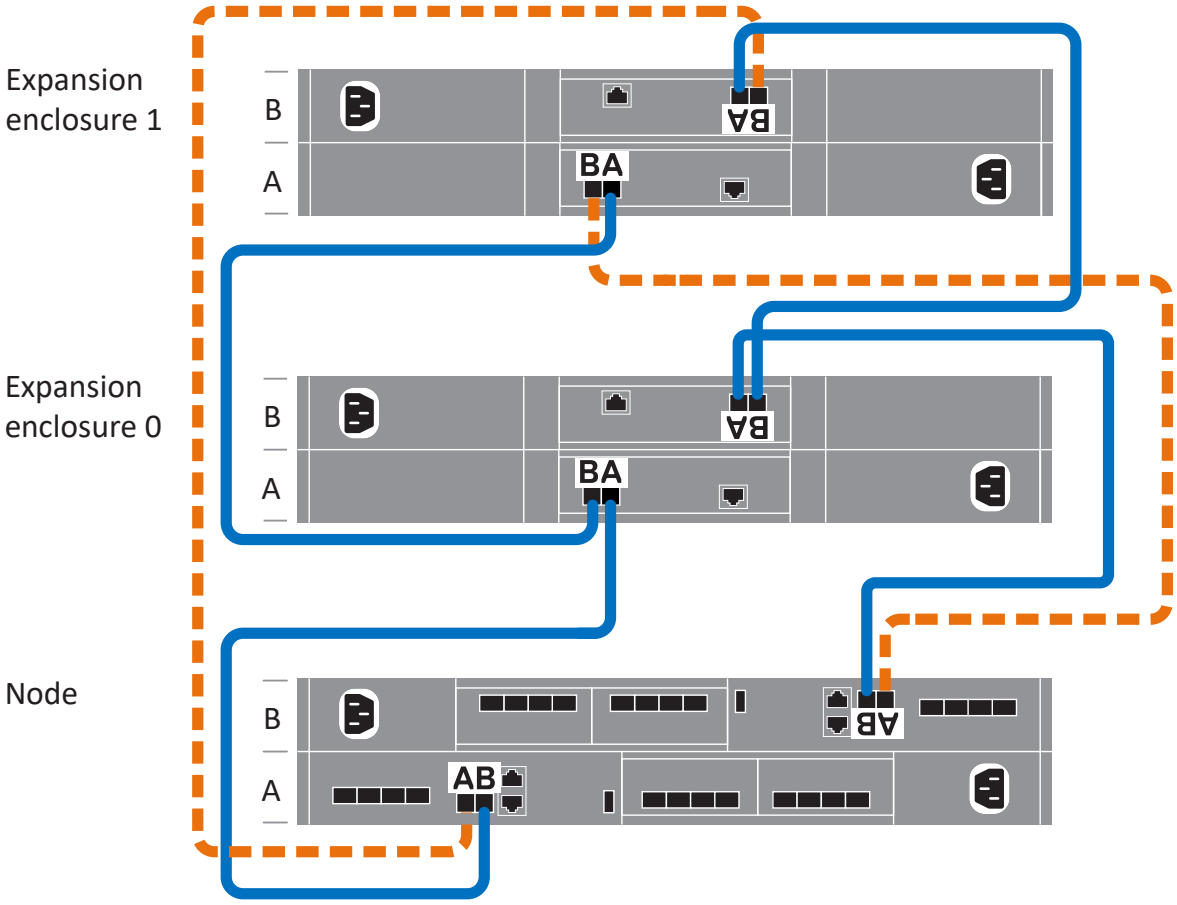


Figure 23. Cabling the base enclosure to two expansion enclosures

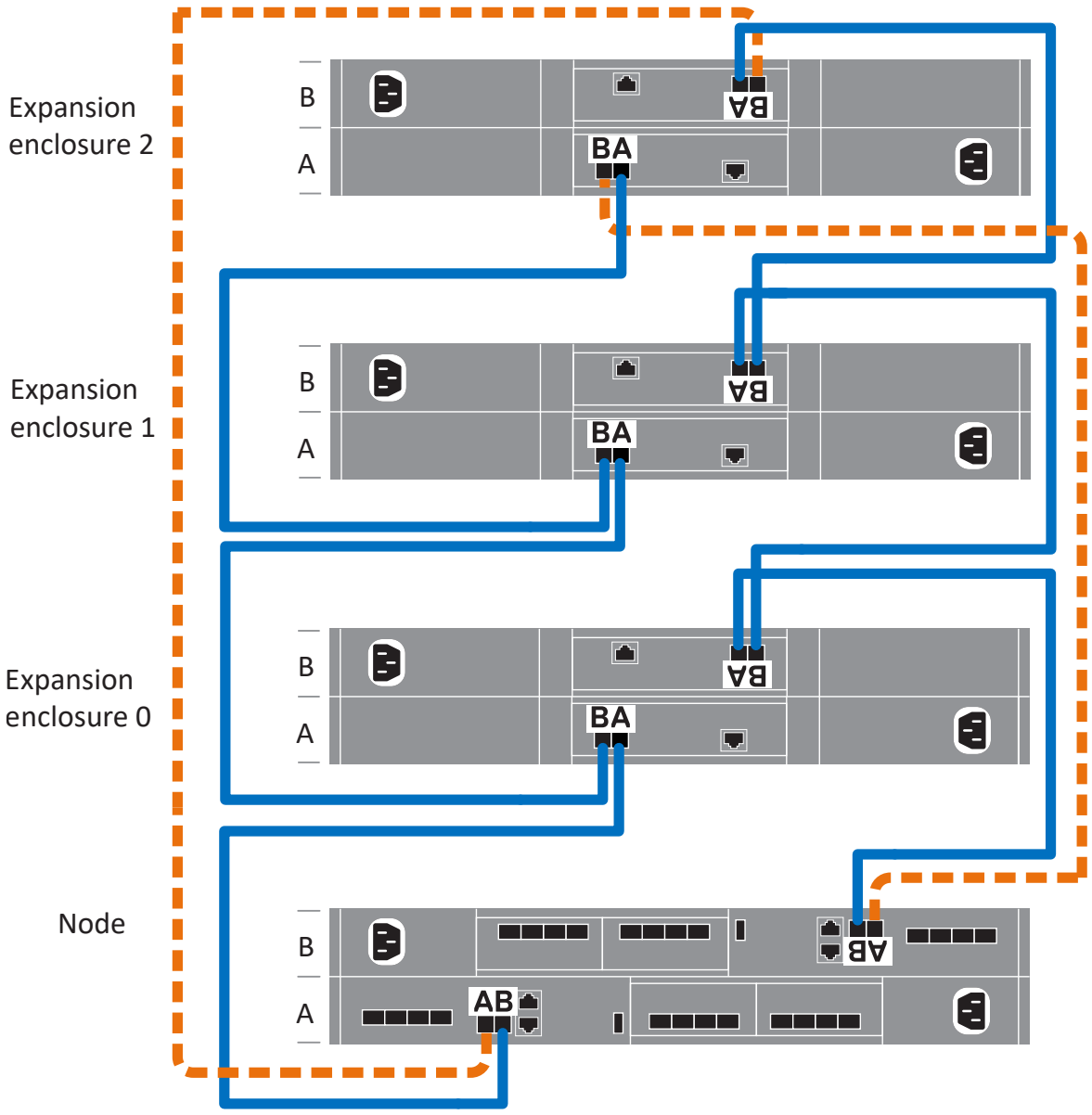


Figure 24. Cabling the base enclosure to three expansion enclosures

NOTE: For additional cabling diagrams, refer to the Cable Label Worksheet.

Install an NVMe expansion enclosure

Take the following actions to install an NVMe expansion enclosure into the system during the initial system installation or to install the first NVMe expansion enclosure into a running system.

NOTE: During the initial system installation, do not power on the system until you have finished cabling all of the expansion enclosures.

CAUTION: On a running cluster, if you are adding an expansion enclosure after installing the first expansion enclosure during initial system installation, you must power on the new expansion enclosure before attaching the back-end cables. Review Installation power overview before proceeding.

Summary of tasks for installing an expansion enclosure

To install an expansion enclosure, complete the tasks below in the order in which they appear. This document provides instructions for completing each task.

1. Verify the contents of the shipping package.
2. Choose the space in the cabinet for the new expansion enclosure.
3. Remove the filler panels that cover the cabinet space for the new expansion enclosure.
4. Install the rails for the new expansion enclosure in the cabinet.
5. Install the expansion enclosure on the rails.
6. Install the cable management arms.
7. Apply cable labels.
8. Review Installation power overview.
9. Attach the expansion (back-end) cables, and then attach the power cables.
10. Close the cable management arms.
11. Test the cable management arms.
12. If the new expansion enclosure shipped without its drives installed, install the drives in the expansion enclosure.
13. Install the front bezel on the new expansion enclosure.

Verify shipping package contents

Confirm that you received all the equipment that is required to install the new NVMe expansion enclosure.

Table 5. Shipping package contents

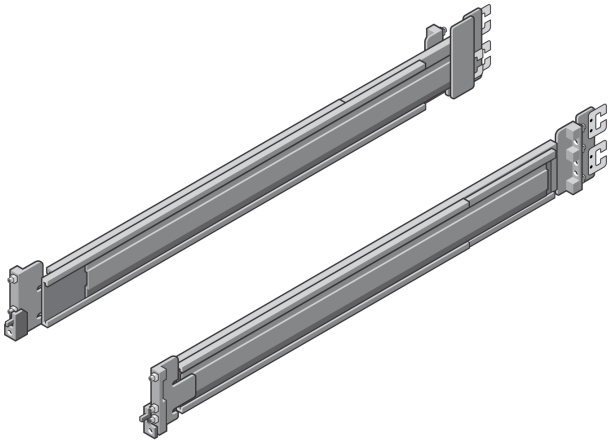
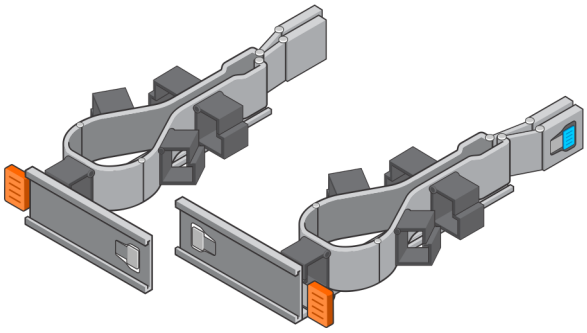
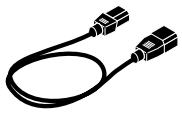
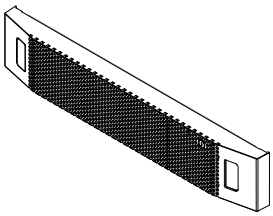
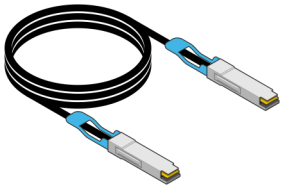
Component		Quantity
NVMe expansion enclosure		1
Rail kit, including Snap-in rails (2) Screws (2 per rail)		1
Cable management arms		2

Table 5. Shipping package contents (continued)

Component		Quantity
Power cords, either Black and gray C13/C14 Black and gray C13/C20		2
Bezel for NVMe expansion enclosure (with key)		1
100G QSFP28 cables to connect the base enclosure to the NVMe expansion enclosure, the NVMe expansion enclosure to another NVMe expansion enclosure, and to loopback from the NVMe expansion enclosure to the base enclosure. **NOTE:** The first NVMe expansion enclosure ships with four 100G QSFP28 cables. The second and third NVMe expansion enclosure ship with two 100G QSFP28 cables.		2

Choose where to install the expansion enclosure

Before installing the new expansion enclosure, you should determine the placement of the new expansion enclosure within the rack.

Steps

1. It is recommended that you install the expansion enclosure in the next available 2U space directly above the base enclosure or the last expansion enclosure in the system.

   Most cabinets mark 1U increments with horizontal lines or small holes in the channels.
2. Considering these recommendations, choose a 2U space in the cabinet for the expansion enclosure.

Removing a filler panel

About this task

In most cases, the front space into which you will install the enclosure is covered by a filler panel.

Steps

If one or more filler panels cover the space where you want to install the enclosure, remove each panel.

Installing the NVMe expansion enclosure rails

About this task

Install the rails from the front of the cabinet into which you are installing the enclosure. The 2U NVMe expansion enclosure includes rails that slide into the cabinet rail assembly. The rails are dedicated left and right, and cannot be interchanged. The front side of each rail is labeled Left Front or Right Front.

Steps

1. Locate the 2U cabinet space designated for the enclosure.
2. Install the right rail to the rear NEMA channel.
   a. Align the right rail with the lower U of the allotted 2U space.
   b. Push the rail back to secure the rail posts in the cabinet NEMA channel. An audible click indicates that the rail is secure in the channel.
3. Install the right rail to the front NEMA channel.
   a. Align the front of the right rail so that it is level.
   b. Pull the rail forward while holding the rail clamp open.
   c. Once the rail posts are in the cabinet NEMA channel, release the rail clamp. An audible click indicates that the connection is secure.
4. Install the left rail by mirroring steps 2 and 3.

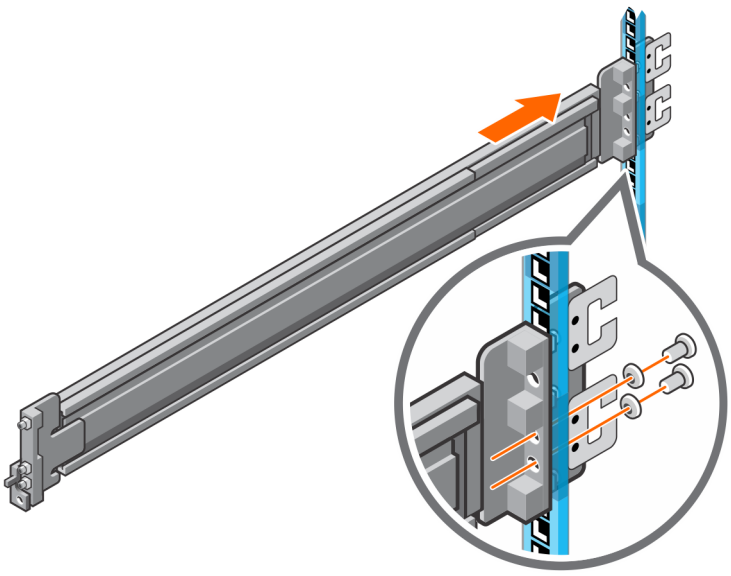


Figure 25. Installing the NVMe expansion enclosure rails (rear)

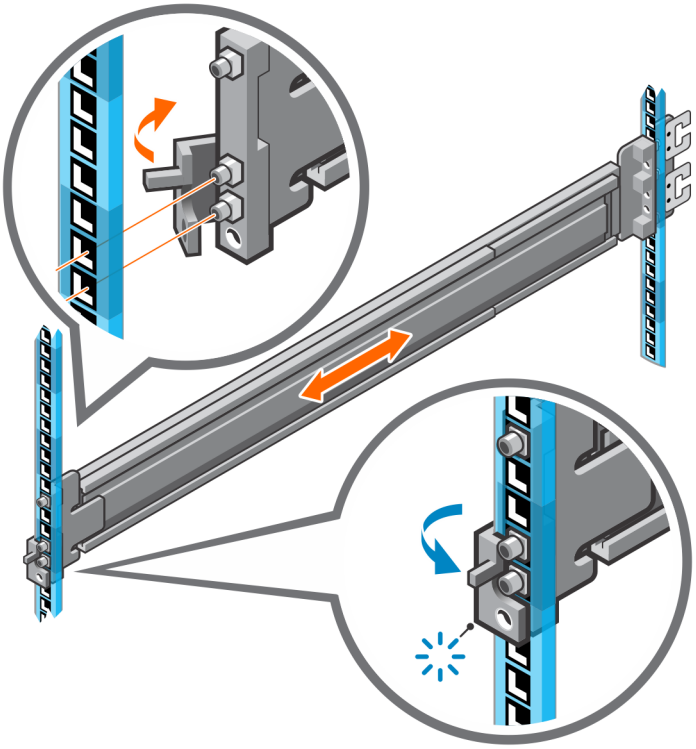


Figure 26. Installing the NVMe expansion enclosure rails (front)

5. Add the retaining screws that came with the rails to the front and back of both rails.

NOTE: Use the washers that came with the rails if the rack holes are square.

NOTE: The screw hole at the front of the rail is behind the rail clamp.

NOTE: You need a long-handled screwdriver to reach the screw hole at the rear of the rack.

NOTE: The following figure does not show the C-clips that are used to attach the cable management arms.

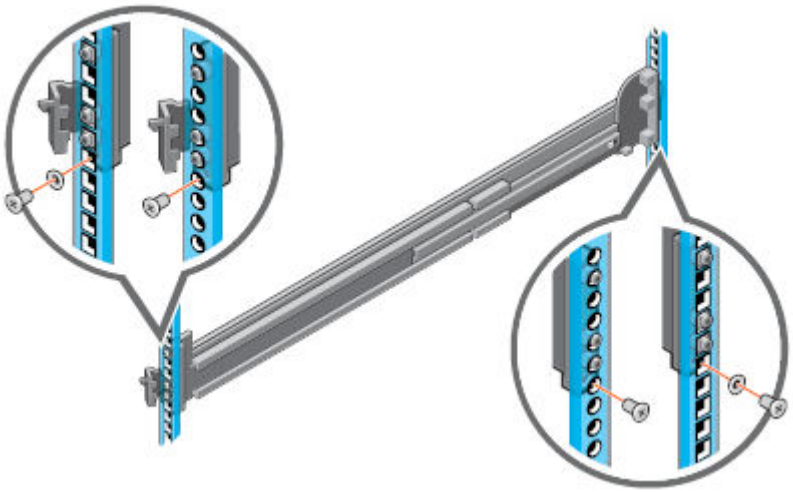


Figure 27. Adding the retaining screws

Install the system in the cabinet

In an angled drop-in design, inner (chassis) rails are attached to the sides of the system and then the system slides into the outer (cabinet) rails that are installed in the rack.

About this task

WARNING: The system is heavy. To avoid personal injury and/or damage to the equipment, do not attempt to install the system in a cabinet without a mechanical lift and/or help from another person.

Steps

1. Pull the inner rails out of the rack until they lock into place.
2. Release the inner rail lock by pulling forward on the orange tabs and sliding the inner rail out of the intermediate rails until they are fully extended.

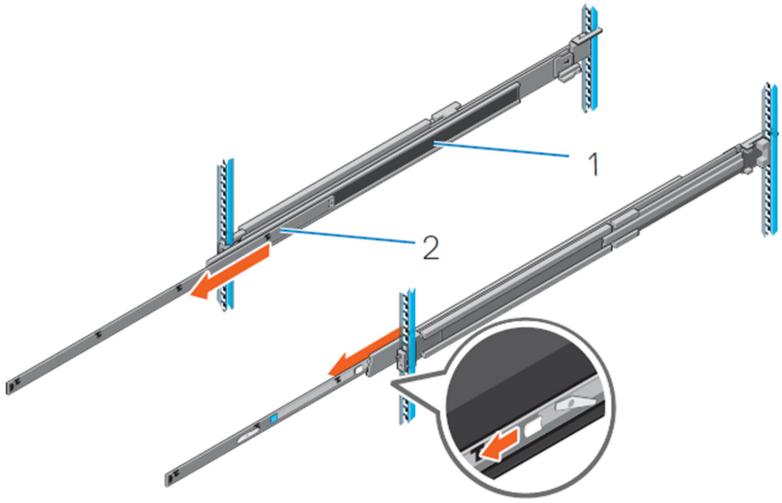


Figure 28. Pull out the intermediate rail

1. Intermediate rail
2. Inner rail

3. Attach the inner rails to the sides of the system by aligning the J-slots on the rail with the standoffs on the system and sliding forward on the system until they lock into place.

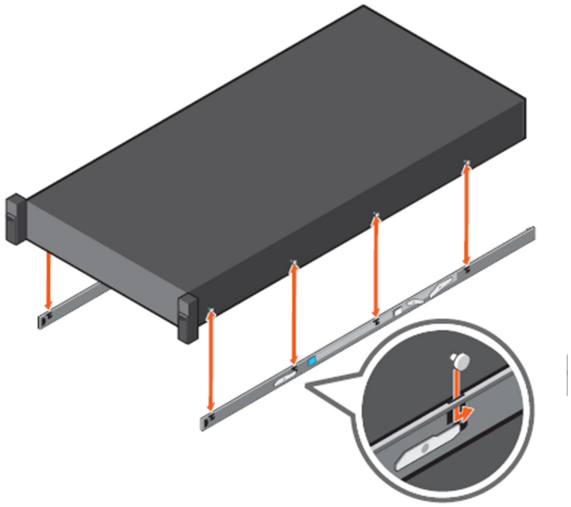


Figure 29. Attach the inner rails to the system

4. Verify all the J-slots on the rails are aligned with the rail standoffs on the system.

CAUTION: Improper installation on the rails may damage the rails or cause the system to fall when extended.

5. With the intermediate rails extended, install the system into the extended rails.

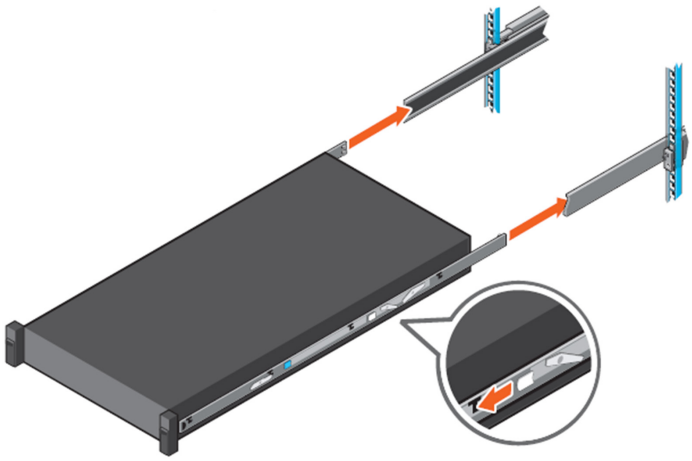


Figure 30. Install system into the extended rails

6. Pull the orange slide release lock tabs forward on both the rails, and slide the system into the rack.

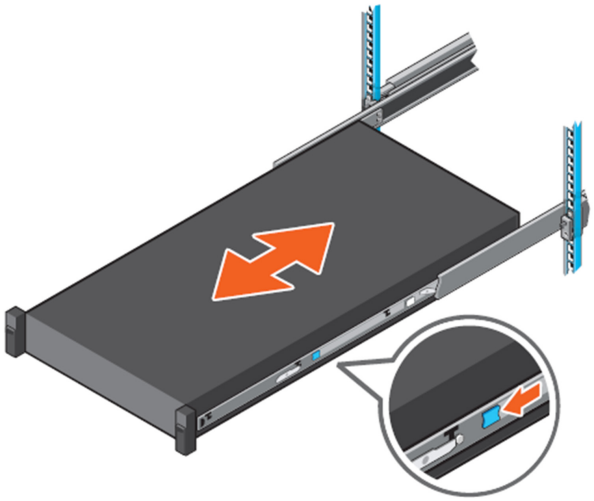


Figure 31. Slide system into the rack

Installing cable management arms

About this task

To properly orient the cable management arms, hold them with the silver side facing down. The words "Upper" and "Lower" on the arms should be legible.

Steps

1. Install the lower cable management arm:
   a. On the right side of the rear of the cabinet, align the two retention latches with the two lower rail clips. Insert the retention latches into the clips until you feel and hear an audible click.
2. Install the upper cable management arm:

a. On the left side of the rear of the cabinet, align the two retention latches with the two upper rail clip. Insert the retention latches into the clips until you feel and hear an audible click.

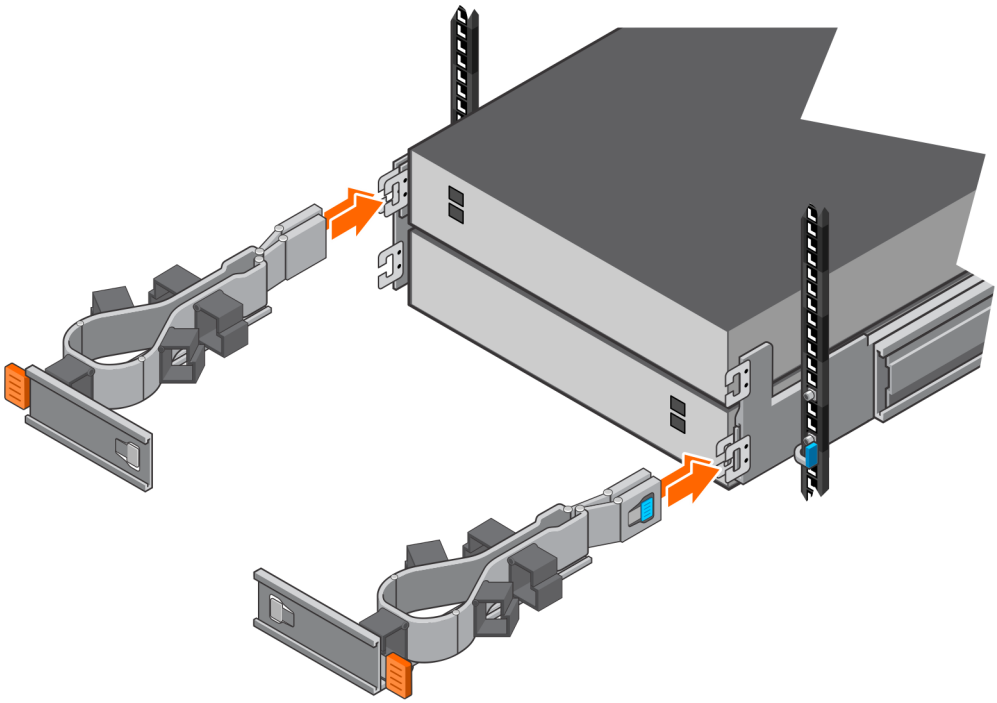


Figure 32. Installing the cable management arms

Cable the base enclosure to the NVMe expansion enclosure

Prerequisites

Determine how many expansion enclosures you are installing. Use the cable label diagrams that shipped with your system to determine the end-to-end locations for the back-end cables.

NOTE: If you are installing more than one NVMe expansion enclosure, use the 2M cables (PN 038-004-928-00) to connect the base enclosure to the NVMe expansion enclosure. Use the 2M cables (PN 038-004-928-00) to connect an NVMe expansion enclosure to another NVMe expansion enclosure with PowerStore version 3.2.0.1 or earlier. Use the 2.5M cables (PN 038-004-986-00) to connect an NVMe expansion enclosure to another NVMe expansion enclosure with PowerStore version 3.2.1 or later. Contact your service provider if you need different cable lengths.

NOTE: Do not plug any cables into the RJ45 ports.

Steps

1. Apply the provided cable labels to each end of the cables.

   NOTE: The system ships with three sheets of labels. All three sheets contain the same information, but they are different colors. You only need to use one label sheet per expansion enclosure. The different colors are to identify which expansion enclosure the cables belong to. For example, you could use the pink label sheet for the first enclosure, and then use the green sheet for the second enclosure.

2. Ensure that the cable management arms (CMAs) are fully open and in the service position.
3. Open the CMA baskets and loosen the velcro straps.
4. Based on the following figures, route the data cables through the CMAs. The cables represented by yellow lines route through the upper CMA, and the cables represented by blue lines route through the lower CMA.

Follow these guidelines when routing cables:

- Gently route the cables into and around the arms without excess bending.
- Ensure that the data cables are oriented correctly to latch into the ports.
- There should not be any more slack between the expansion enclosure and the CMA than is needed to direct the cable. Any excess length should be outside of the CMA and dressed when cabling is complete.
- In two or three expansion enclosure configurations, route the data cables between the expansion enclosures through the CMA for one expansion enclosure and into the CMA of the other expansion enclosure.

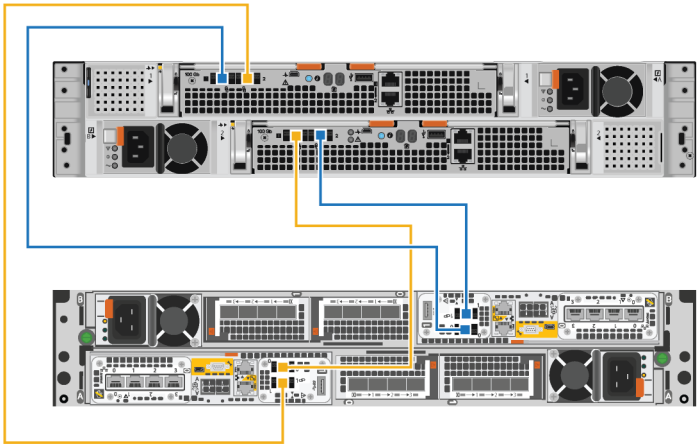


Figure 33. Cabling a single expansion enclosure

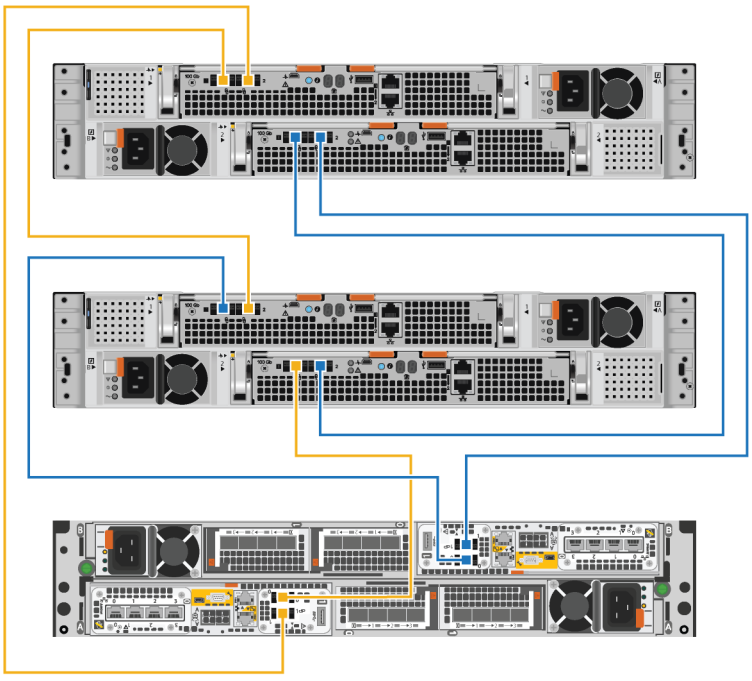


Figure 34. Cabling two expansion enclosures

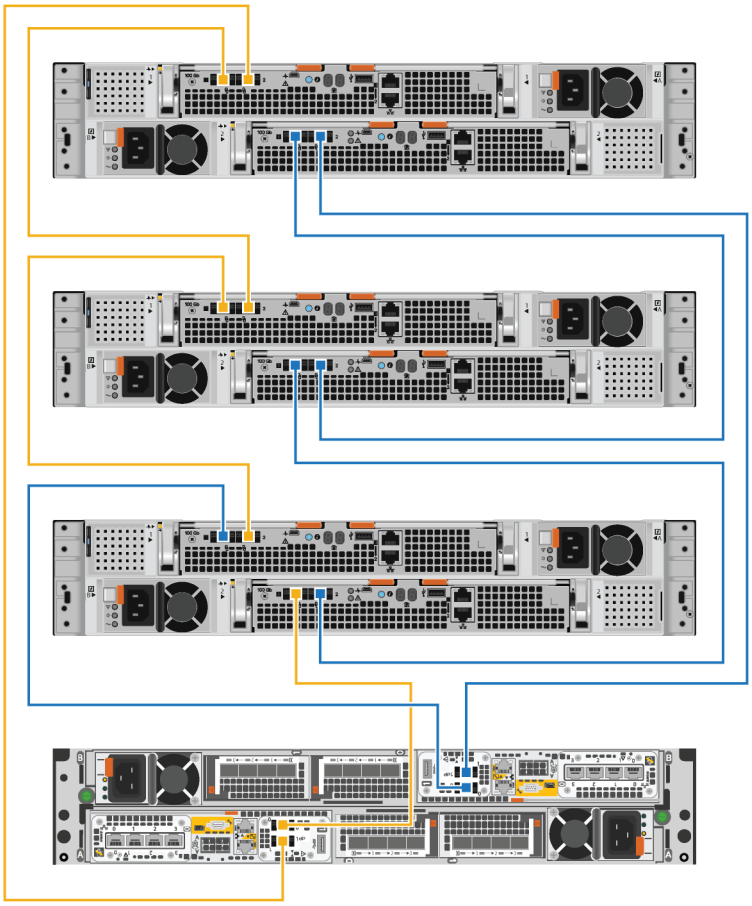


Figure 35. Cabling three expansion enclosures

5. Route the power cables through the CMAs. The power cables for power supplies on the left route through the upper CMA. The power cables for power supplies on the right route through the lower CMAs.
6. Plug each power cable into the expansion enclosure power supply and secure the cord with the retention bail at the connector.

   NOTE: If the power source PDU is energized, do not connect the power cables to the PDU until the system is ready to be brought online. If you connect the power cables sooner, the system may power on during the installation.

   NOTE: It is recommended that you plug in the black power cables on the left and the gray power cables on the right. The power cables work in either power supply, but a consistent cabling method makes it easier to troubleshoot issues.

7. Close all the baskets and tighten the Velcro on the arms to prevent the cables from slipping.

Closing the cable management arms

Steps

1. Close the lower cable management arm:
   a. Swing the lower cable management arm to the left side of the enclosure, and align the retention latch with the lower rail bracket.
   b. Press the retention latch onto the lower rail bracket.
   c. Ensure that you hear the audible click that indicates that the lower cable management arm is in place.
2. Close the upper cable management arm:

a. Swing the upper cable management arm to the right side of the enclosure, and align the retention latch with the upper rail bracket.
b. Press the retention latch onto the upper rail bracket.
c. Ensure that you hear the audible click that indicates that the upper cable management arm is in place.

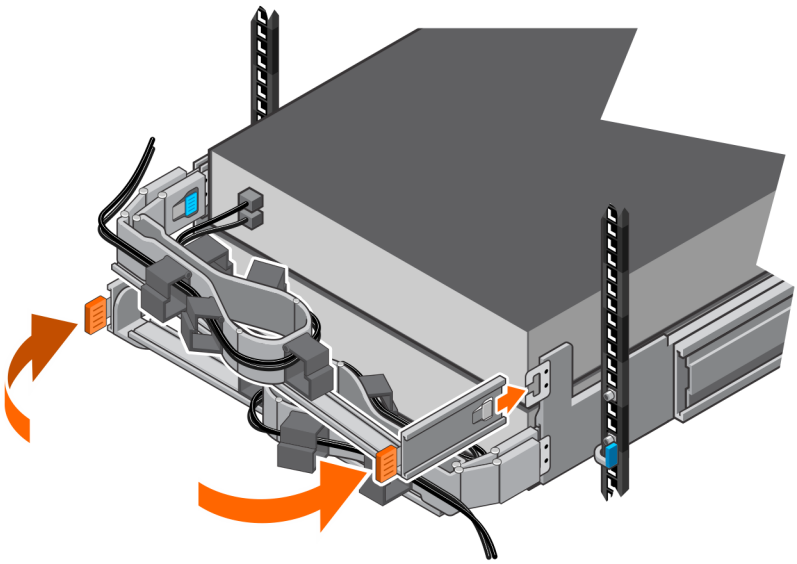


Figure 36. Closing the cable management arms

Testing the cable management arms

Steps

1. From the front of the rack, lift the black tabs on the expansion enclosure and slowly pull the expansion enclosure from the rack to ensure that proper slack has been provided for the cables.
2. Ensure that the stops on the rails engage into the service position when the top access door is clear.
3. If you feel resistence, stop pulling and adjust any tight cables so that pulling the expansion enclosure from the rack does not strain any cables or pull them from the ports.
4. Ensure that you can remove the expansion enclosure from the rack until it is in the service position. The expansion enclosure is in the service position when it clicks into place and will not move any further.
5. Once you have finished adjusting the cables, pull the orange tabs on the side of the expansion enclosure, and push the expansion enclosure back into the rack until it locks into place.
6. Inspect the cables again to make any necessary final adjustments.
7. Using a Philips screwdriver, tighten the chassis-securing screws located under the self-locking latches on the front of the expansion enclosure. These screws secure the expansion enclosure chassis to the cabinet rails in the event that the cabinet needs to be moved.

Installing drives

If the drives shipped separately from the enclosure, install them in the enclosure now. If the drives are already installed in the enclosure, you are ready to install the bezel.

Installing a drive

About this task

NOTE: If you are installing multiple drives in a system that is powered up, wait at least 10 seconds before sliding the next drive into position, but do not exceed 2 minutes. This will allow the system to determine the best RAID width.

NOTE: Drives must be installed from left-to-right starting with the first available slot.

Steps

1. Align the drive with the guides in the slot.
2. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
3. Push the orange button until the drive is fully seated in the slot.
4. Push the latch down until it locks into place.

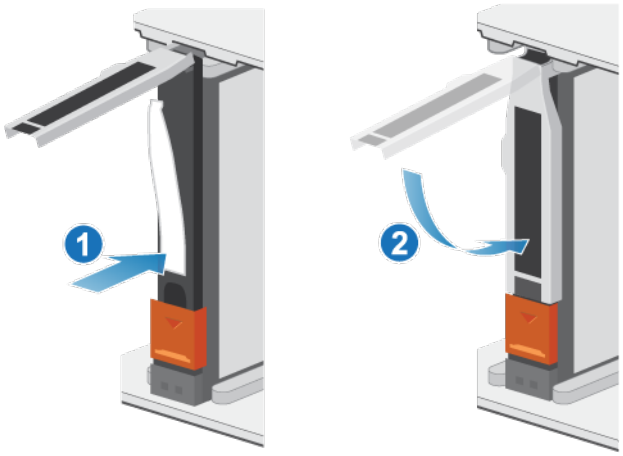


Figure 37. Installing a drive

The activity light flashes to indicate that the spin-up sequence has begun.

Installing the front bezel

Prerequisites

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

About this task

Refer to Installing the bezel while performing the procedure that follows.

Steps

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.

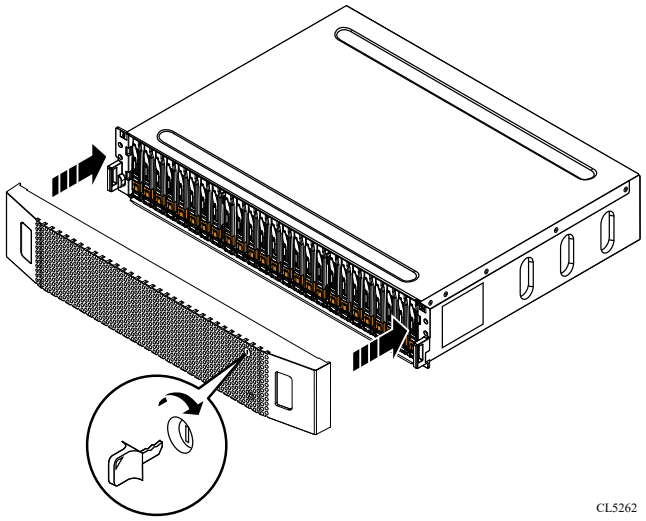


Figure 38. Installing the bezel

Add an NVMe expansion enclosure

Take the following actions to add an NVMe expansion enclosure to a running system with existing expansion enclosures.

NOTE: If this is the first NVMe expansion enclosure, refer to Install an ENS24 expansion enclosure.

Summary of tasks for adding an expansion enclosure

To add an expansion enclosure to a running system, complete the tasks below in the order in which they appear. This document provides instructions for completing each task.

NOTE: When adding an expansion enclosure to a running system, you must power on the expansion enclosure before attaching the back-end cables.

1. Verify the contents of the shipping package.
2. Choose the space in the cabinet for the new expansion enclosure.
3. Remove the filler panels that cover the cabinet space for the new expansion enclosure.
4. Install the rails for the new expansion enclosure in the cabinet.
5. Install the expansion enclosure on the rails.
6. Install the cable management arms.
7. Apply cable labels.
8. Route the data cables and power cords through the cable management arms.
9. Attach the power cables to the new expansion enclosure.
10. Close the cable management arms.
11. Test the cable management arms.
12. Plug the power cables into the power source.
13. Attach the expansion (back-end) cables to the new expansion enclosure.
14. If the new expansion enclosure shipped without its drives installed, install the drives in the expansion enclosure.
15. Install the front bezel on the new expansion enclosure.

Verify shipping package contents

Confirm that you received all the equipment that is required to install the new NVMe expansion enclosure.

Table 6. Shipping package contents

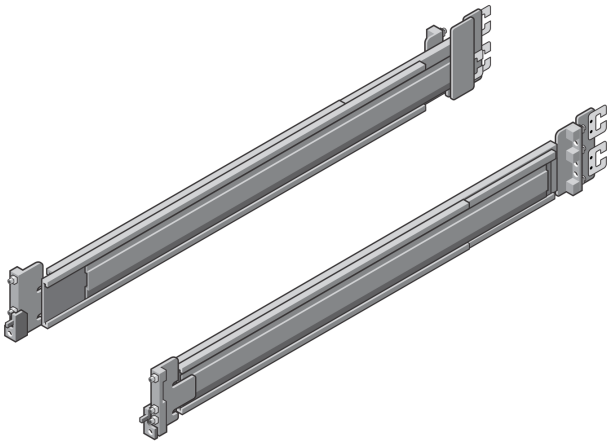
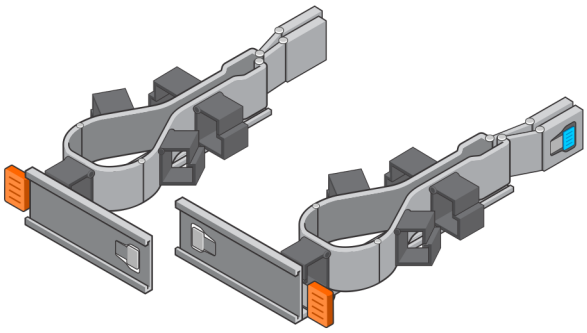
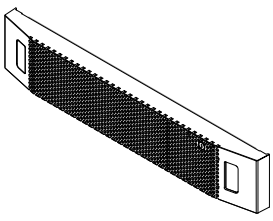
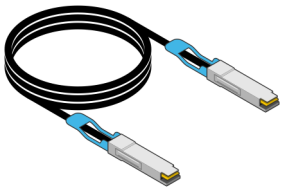
Component		Quantity
NVMe expansion enclosure		1
Rail kit, including Snap-in rails (2) Screws (2 per rail)		1
Cable management arms		2
Power cords, either Black and gray C13/C14 Black and gray C13/C20		2
Bezel for NVMe expansion enclosure (with key)		1

Table 6. Shipping package contents (continued)

Component		Quantity
100G QSFP28 cables to connect the base enclosure to the NVMe expansion enclosure, the NVMe expansion enclosure to another NVMe expansion enclosure, and to loopback from the NVMe expansion enclosure to the base enclosure. **NOTE:** The first NVMe expansion enclosure ships with four 100G QSFP28 cables. The second and third NVMe expansion enclosure ship with two 100G QSFP28 cables.		2

Choose where to install the expansion enclosure

Before installing the new expansion enclosure, you should determine the placement of the new expansion enclosure within the rack.

Steps

1. It is recommended that you install the expansion enclosure in the next available 2U space directly above the base enclosure or the last expansion enclosure in the system.

   Most cabinets mark 1U increments with horizontal lines or small holes in the channels.
2. Considering these recommendations, choose a 2U space in the cabinet for the expansion enclosure.

Removing a filler panel

About this task

In most cases, the front space into which you will install the enclosure is covered by a filler panel.

Steps

If one or more filler panels cover the space where you want to install the enclosure, remove each panel.

Installing the NVMe expansion enclosure rails

About this task

Install the rails from the front of the cabinet into which you are installing the enclosure. The 2U NVMe expansion enclosure includes rails that slide into the cabinet rail assembly. The rails are dedicated left and right, and cannot be interchanged. The front side of each rail is labeled Left Front or Right Front.

Steps

1. Locate the 2U cabinet space designated for the enclosure.
2. Install the right rail to the rear NEMA channel.
   a. Align the right rail with the lower U of the allotted 2U space.

b. Push the rail back to secure the rail posts in the cabinet NEMA channel. An audible click indicates that the rail is secure in the channel.

3. Install the right rail to the front NEMA channel.
   a. Align the front of the right rail so that it is level.
   b. Pull the rail forward while holding the rail clamp open.
   c. Once the rail posts are in the cabinet NEMA channel, release the rail clamp. An audible click indicates that the connection is secure.
4. Install the left rail by mirroring steps 2 and 3.

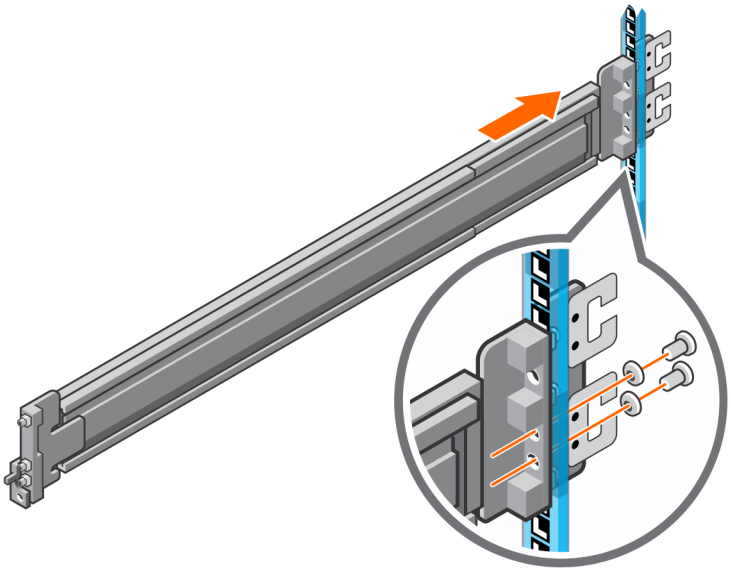


Figure 39. Installing the NVMe expansion enclosure rails (rear)

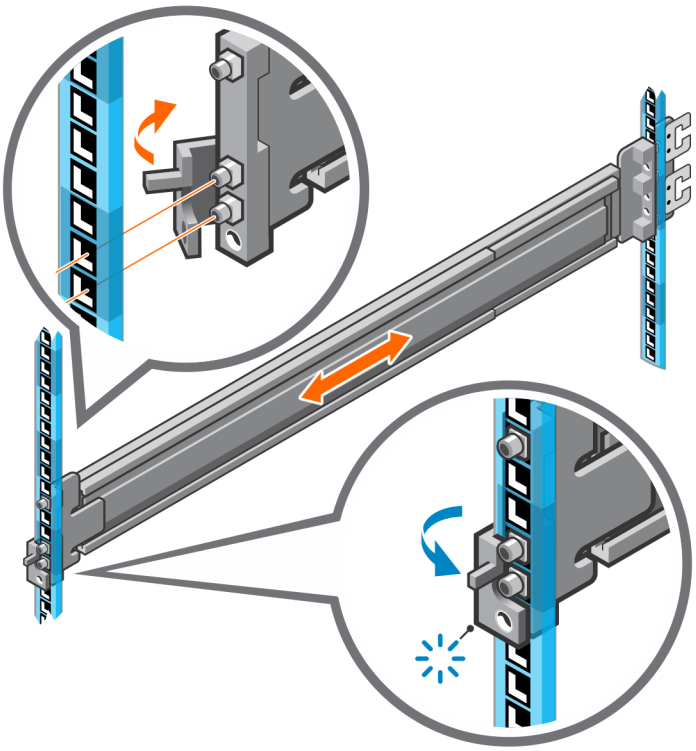


Figure 40. Installing the NVMe expansion enclosure rails (front)

5. Add the retaining screws that came with the rails to the front and back of both rails.

NOTE: Use the washers that came with the rails if the rack holes are square.

NOTE: The screw hole at the front of the rail is behind the rail clamp.

NOTE: You need a long-handled screwdriver to reach the screw hole at the rear of the rack.

NOTE: The following figure does not show the C-clips that are used to attach the cable management arms.

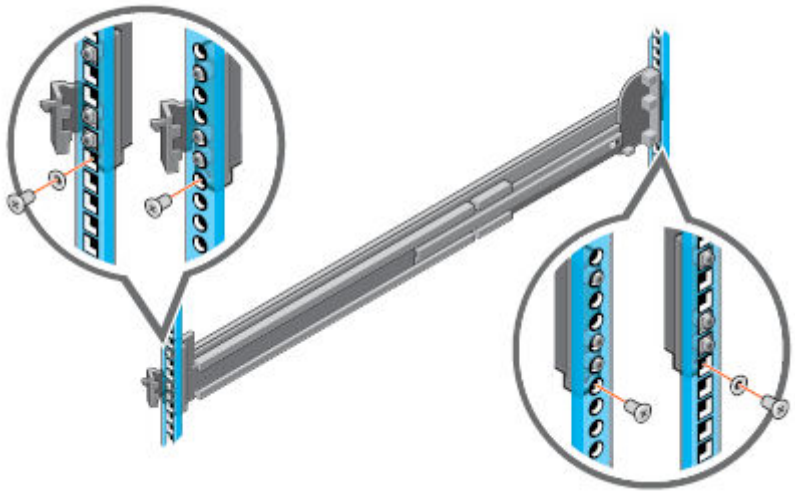


Figure 41. Adding the retaining screws

Install the system in the cabinet

In an angled drop-in design, inner (chassis) rails are attached to the sides of the system and then the system slides into the outer (cabinet) rails that are installed in the rack.

About this task

WARNING: The system is heavy. To avoid personal injury and/or damage to the equipment, do not attempt to install the system in a cabinet without a mechanical lift and/or help from another person.

Steps

1. Pull the inner rails out of the rack until they lock into place.
2. Release the inner rail lock by pulling forward on the orange tabs and sliding the inner rail out of the intermediate rails until they are fully extended.

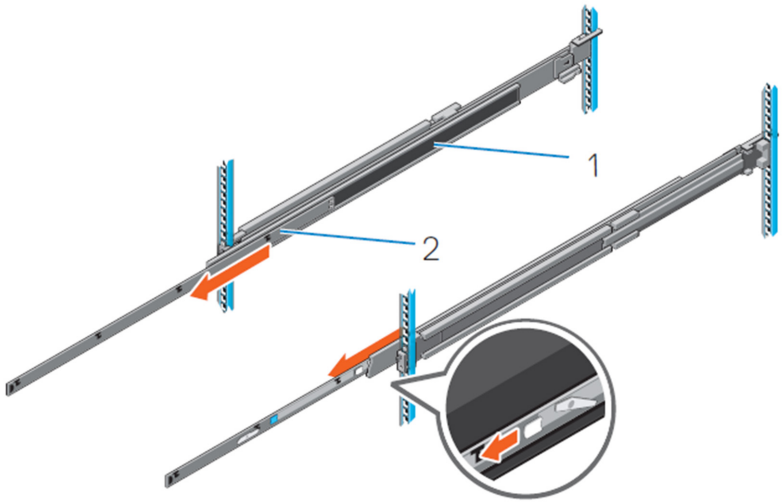


Figure 42. Pull out the intermediate rail

1. Intermediate rail
2. Inner rail

3. Attach the inner rails to the sides of the system by aligning the J-slots on the rail with the standoffs on the system and sliding forward on the system until they lock into place.

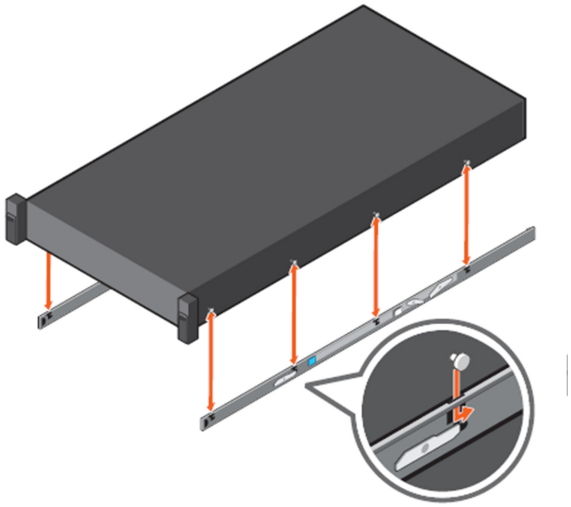


Figure 43. Attach the inner rails to the system

4. Verify all the J-slots on the rails are aligned with the rail standoffs on the system.

CAUTION: Improper installation on the rails may damage the rails or cause the system to fall when extended.

5. With the intermediate rails extended, install the system into the extended rails.

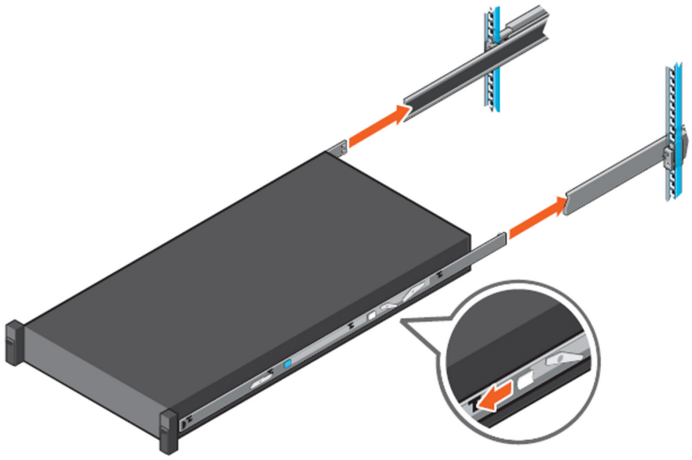


Figure 44. Install system into the extended rails

6. Pull the orange slide release lock tabs forward on both the rails, and slide the system into the rack.

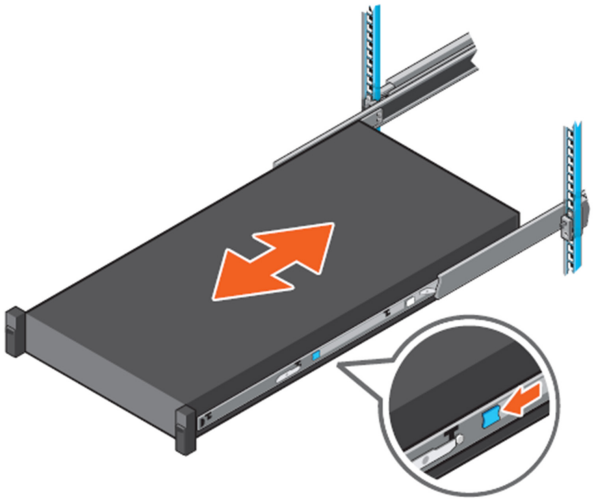


Figure 45. Slide system into the rack

Installing cable management arms

About this task

To properly orient the cable management arms, hold them with the silver side facing down. The words "Upper" and "Lower" on the arms should be legible.

Steps

1. Install the lower cable management arm:
   a. On the right side of the rear of the cabinet, align the two retention latches with the two lower rail clips. Insert the retention latches into the clips until you feel and hear an audible click.
2. Install the upper cable management arm:
   a. On the left side of the rear of the cabinet, align the two retention latches with the two upper rail clip. Insert the retention latches into the clips until you feel and hear an audible click.

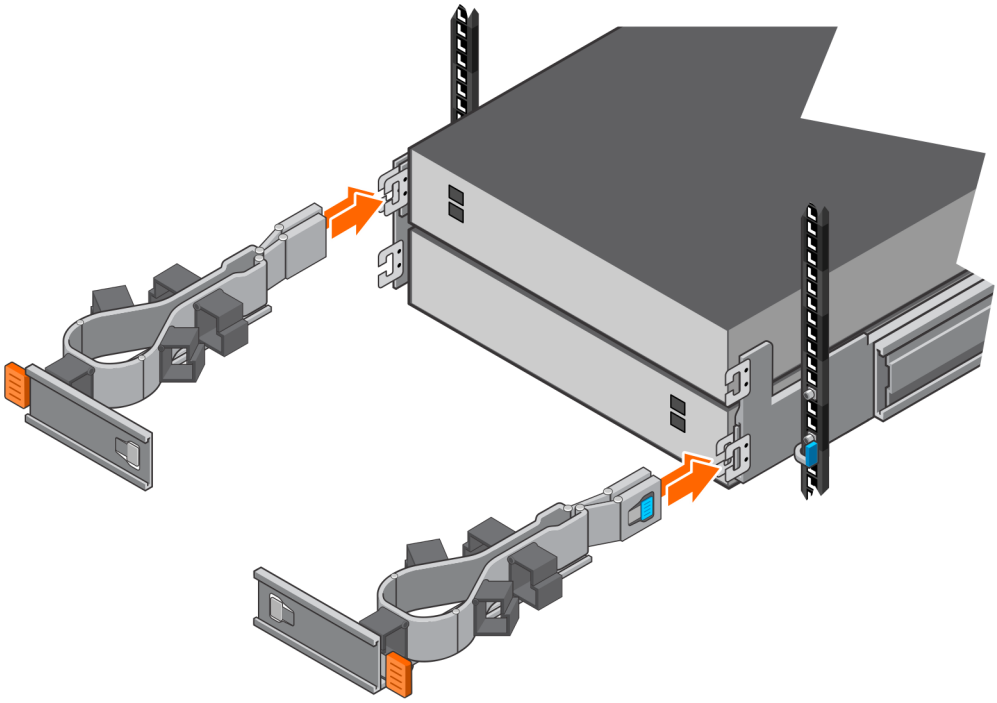


Figure 46. Installing the cable management arms

Cable the new NVMe expansion enclosure

Follow these guidelines to cable an expansion enclosure in a running system to a new expansion enclosure.

Prerequisites

Apply cable labels to the cables connecting the expansion enclosures. "Last expansion enclosure" refers to the last expansion enclosure that is currently installed. The "new expansion enclosure" refers to the expansion enclosure that you are adding.

CAUTION: Incorrect cabling could cause all new drives to be locked.

NOTE: Do not plug any cables into the RJ45 ports.

About this task

Route the data cables through the cable management arms, but do not connect them to the ports yet. Ensure that there is enough slack for each cable to connect to the designated port.

Steps

1. Move the two loopback cables from port 2 of the last expansion enclosure to port 2 of the new expansion enclosure:
   a. Disconnect the QSFP cable from LCC 1, port 2 of the last expansion enclosure and move it to LCC 1, port 2 of the new expansion enclosure.
   b. Disconnect the QSFP cable from LCC 2, port 2 of the last expansion enclosure and move it to LCC 2, port 2 of the new expansion enclosure.
2. Add two new cables from port 2 of the last expansion enclosure to port 1 of the new expansion enclosure:
   a. Use a new QSFP cable to connect LCC 1, port 2 of the last expansion enclosure to LCC 1, port 1 of the new expansion enclosure.
   b. Use a new QSFP cable to connect LCC 2, port 2 of the last expansion enclosure to LCC 2, port 1 of the new expansion enclosure.

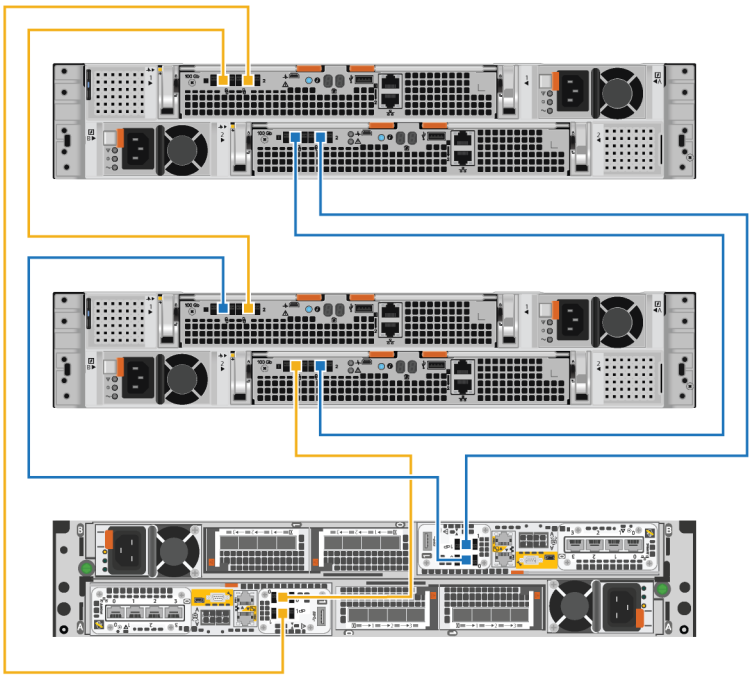


Figure 47. Cabling two expansion enclosures

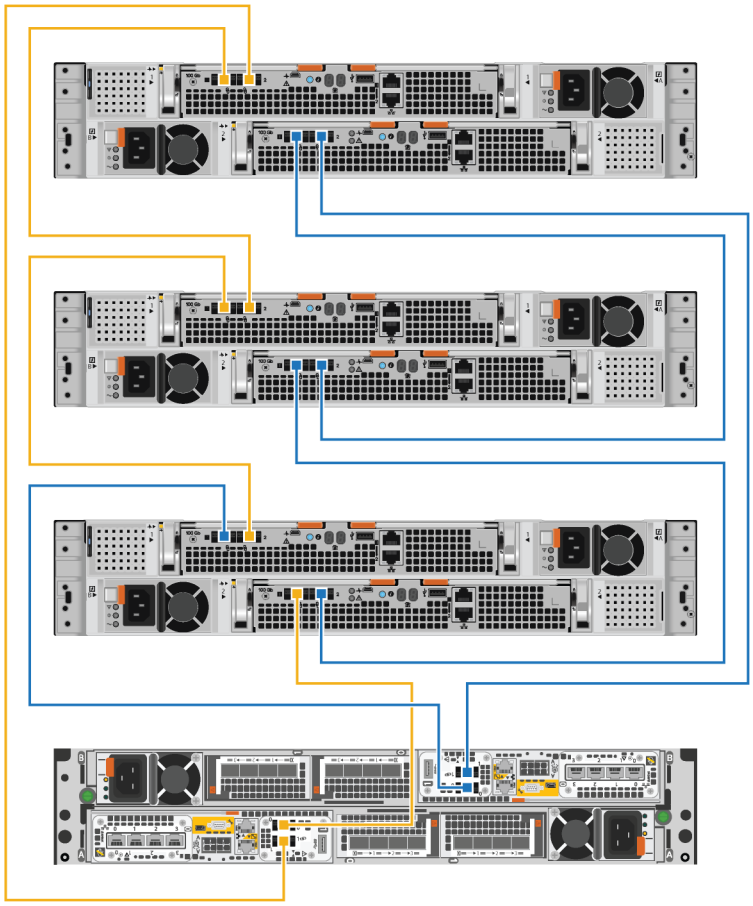


Figure 48. Cabling three expansion enclosures

3. Route the power cables through the cable management arms. The power cables for power supplies on the left route through the upper cable management arms. The power cables for power supplies on the right route through the lower cable management arms.
4. Plug each power cable into the expansion enclosure power supply and secure the cord with the retention bail at the connector.

   NOTE: If the power source PDU is energized, do not connect the power cables to the PDU until the system is ready to be brought online. If you connect the power cables sooner, the system may power on during the installation.

   NOTE: It is recommended to plug in the black power cables on the left and the gray power cables on the right. The power cables work in either power supply, but a consistent cabling method makes it easier to troubleshoot issues.

Closing the cable management arms

Steps

1. Close the lower cable management arm:
   a. Swing the lower cable management arm to the left side of the enclosure, and align the retention latch with the lower rail bracket.
   b. Press the retention latch onto the lower rail bracket.
   c. Ensure that you hear the audible click that indicates that the lower cable management arm is in place.
2. Close the upper cable management arm:
   a. Swing the upper cable management arm to the right side of the enclosure, and align the retention latch with the upper rail bracket.

b. Press the retention latch onto the upper rail bracket.
c. Ensure that you hear the audible click that indicates that the upper cable management arm is in place.

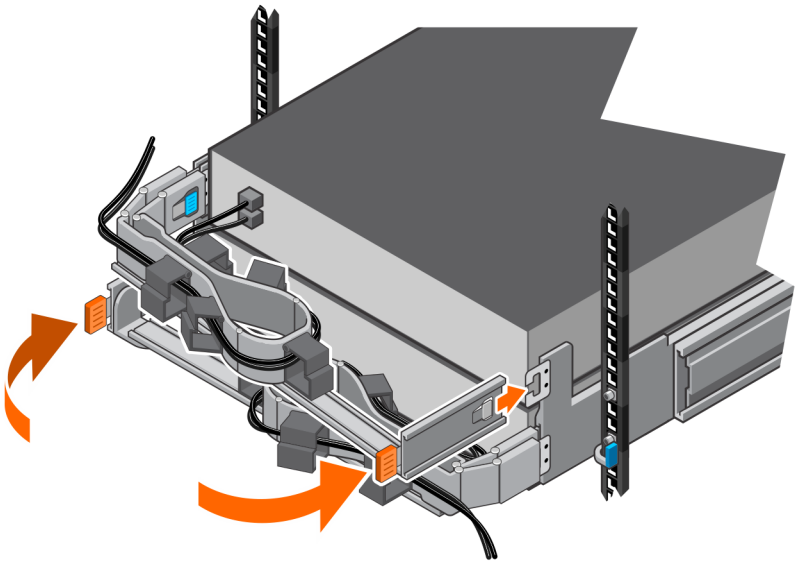


Figure 49. Closing the cable management arms

Testing the cable management arms

Steps

1. From the front of the rack, lift the black tabs on the expansion enclosure and slowly pull the expansion enclosure from the rack to ensure that proper slack has been provided for the cables.
2. Ensure that the stops on the rails engage into the service position when the top access door is clear.
3. If you feel resistence, stop pulling and adjust any tight cables so that pulling the expansion enclosure from the rack does not strain any cables or pull them from the ports.
4. Ensure that you can remove the expansion enclosure from the rack until it is in the service position. The expansion enclosure is in the service position when it clicks into place and will not move any further.
5. Once you have finished adjusting the cables, pull the orange tabs on the side of the expansion enclosure, and push the expansion enclosure back into the rack until it locks into place.
6. Inspect the cables again to make any necessary final adjustments.
7. Using a Philips screwdriver, tighten the chassis-securing screws located under the self-locking latches on the front of the expansion enclosure. These screws secure the expansion enclosure chassis to the cabinet rails in the event that the cabinet needs to be moved.

Attach the cables

Steps

1. Plug the power cables into the power source.
2. Attach the data cables to the ports on the new expansion enclosure.

Installing drives

If the drives shipped separately from the enclosure, install them in the enclosure now. If the drives are already installed in the enclosure, you are ready to install the bezel.

Installing a drive

About this task

NOTE: If you are installing multiple drives in a system that is powered up, wait at least 10 seconds before sliding the next drive into position, but do not exceed 2 minutes. This will allow the system to determine the best RAID width.

NOTE: Drives must be installed from left-to-right starting with the first available slot.

Steps

1. Align the drive with the guides in the slot.
2. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
3. Push the orange button until the drive is fully seated in the slot.
4. Push the latch down until it locks into place.

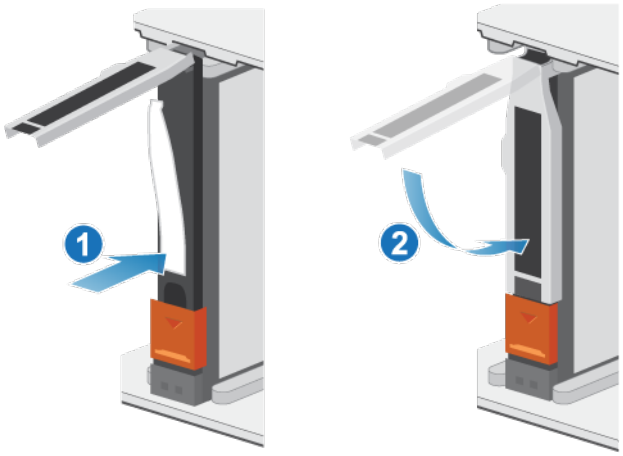


Figure 50. Installing a drive

The activity light flashes to indicate that the spin-up sequence has begun.

Installing the front bezel

Prerequisites

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

About this task

Refer to Installing the bezel while performing the procedure that follows.

Steps

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.

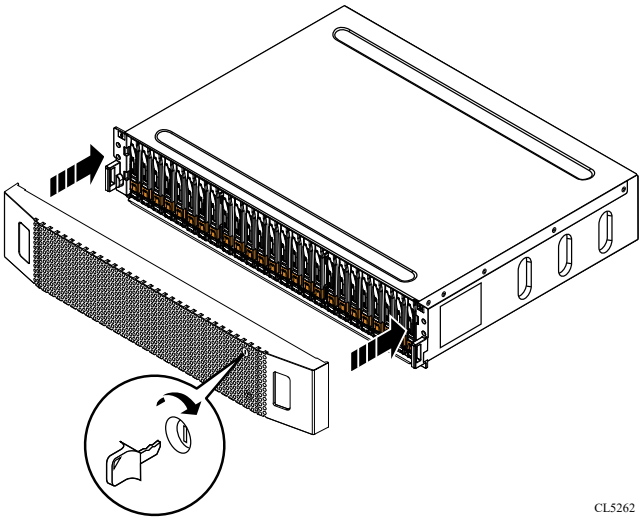


Figure 51. Installing the bezel

2

Base enclosure service procedures

The base enclosure contains customer-replaceable components. Follow these procedures to safely replace a failed component.

NOTE: Review the information in Safety precautions for handling replaceable units before handling replaceable parts.

Topics:

Replace a faulted drive in the base enclosure

Take the following actions to remove a faulted drive and install the replacement drive into the base enclosure.

NOTE: If you are proactively replacing multiple drives, use the Proactive Drive Replacement procedure available in SolVe.

Identify a faulted drive from PowerStore Manager

Before you replace a drive, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted drive.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the drive that you need to replace.
3. On the **Components** card, under **Drives**, expand **BaseEnclosure** and select the faulted drive.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.
4. Click **Blink LED**.
   The amber fault light on the drive starts blinking.

Remove a faulted 2.5" drive

Steps

1. Check PowerStore Manager to ensure that it is not displaying an event banner indicating that drives should not be removed.
2. Locate the drive with the blinking amber LED fault light.
3. If you are removing an NVMe NVRAM drive, push the latch cover up.

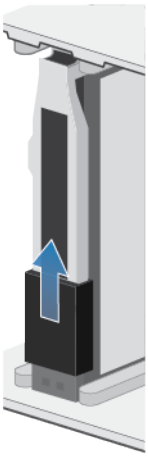


Figure 52. Pushing up the drive latch cover

4. Push down the orange button to release the latch.
5. Remove the drive from the slot.

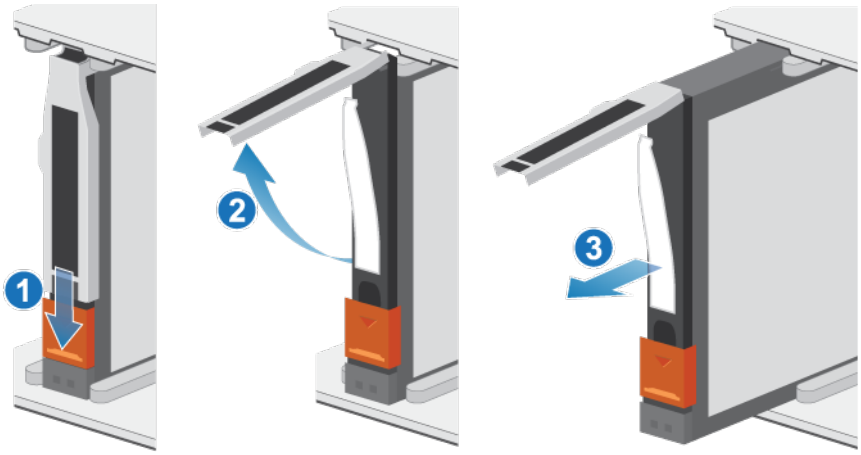


Figure 53. Removing a 2.5" drive

6. Place the drive on a static-free surface.

Install a 2.5" drive

Steps

1. Align the drive with the guides in the slot.
2. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
3. Push the orange button until the drive is fully seated in the slot.
4. Push the latch down until it locks into place.

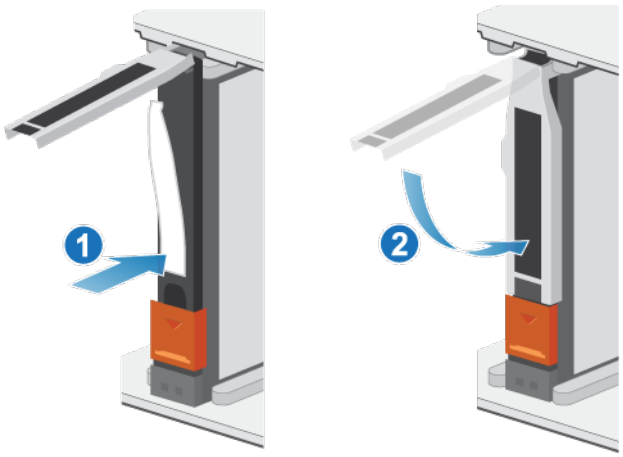


Figure 54. Installing a 2.5" drive

5. If you are installing an NVMe NVRAM drive, push the latch cover into place.

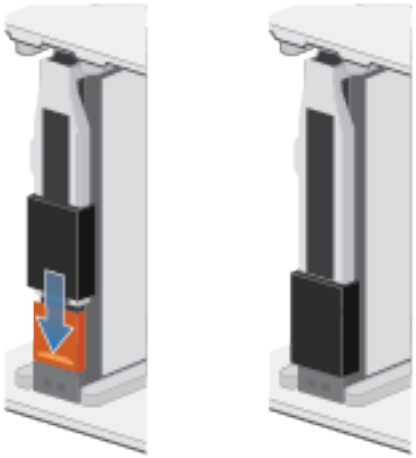


Figure 55. Pushing the latch cover into place

The activity light flashes to indicate that the spin-up sequence has begun.

Verify the operation of a replacement drive

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the drive.
3. On the **Components** card, under **Drives**, expand **BaseEnclosure** and select the drive.
   The status of the replacement drive should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the drive is correctly seated, or contact your service provider.
4. Click **Stop Blink LED**.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Add a new drive to the base enclosure

Take the following actions to add a new drive to the base enclosure.

CAUTION: Do not add drives to powered off systems. For details, see Dell knowledge base article 000187118.

Removing the front bezel

Steps

1. If the bezel has a lock, insert the key that shipped with your enclosure into the lock, and turn the key to unlock the bezel.
2. Press the two latch buttons on the bezel surface to release the bezel from the cabinet.
3. Pull the bezel off the cabinet and put it on a clean, static-free surface.

Remove a drive filler module

Steps

1. Insert your finger into the cutout on the drive filler module.
2. Pull the filler module out of the slot.

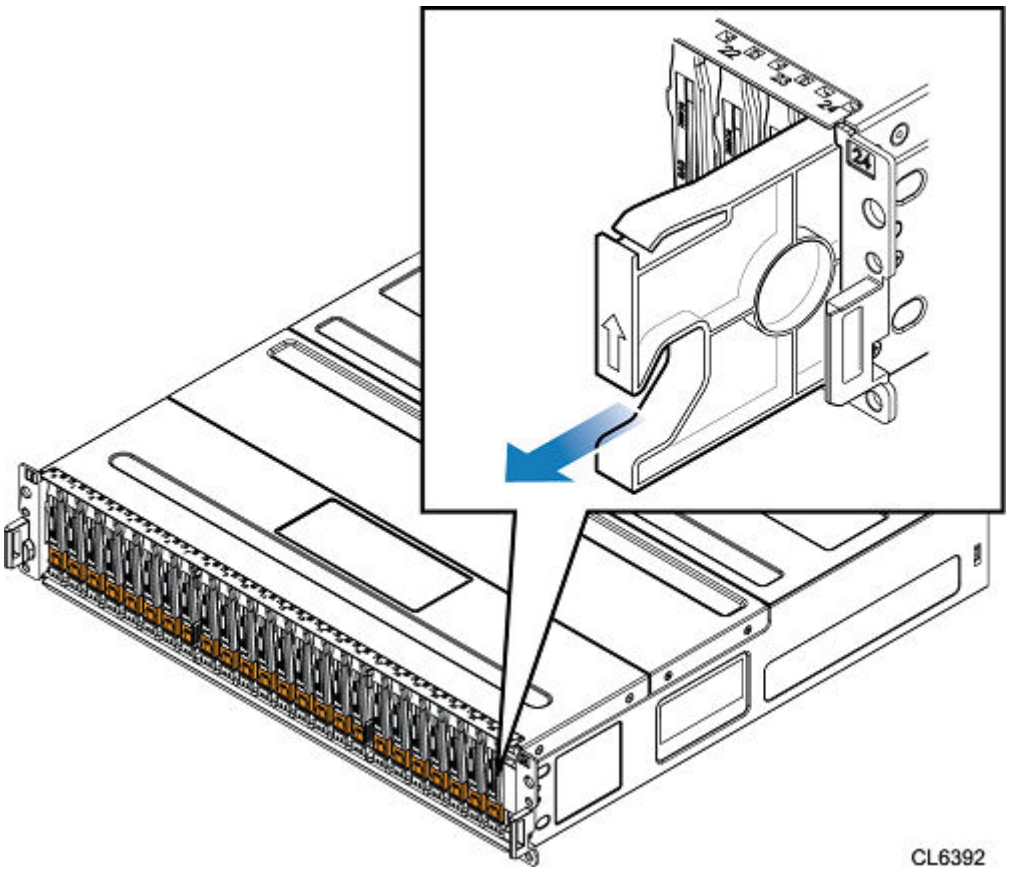


Figure 56. Removing a drive filler module

Install a 2.5" drive

About this task

NOTE: If you are installing multiple drives in a system that is powered up, wait at least 10 seconds before sliding the next drive into position, but do not exceed 2 minutes. This will allow the system to determine the best RAID width.

NOTE: NVMe SSD and NVMe SCM drives must be installed from left-to-right starting with the first available slot.

NOTE: NVMe NVRAM drives are used for system caching and can only be installed in the last four slots (21 through 24) of the base enclosure. In configurations that only use two NVMe NVRAM drives, slots 21 and 22 should remain empty. The system will allow you to install drives in slots 21 and 22, but doing so will make future upgrades to systems with four NVMe NVRAM drives more difficult. If there are drives in slots 21 and 22, you will need to migrate the data from the drives so they can be removed and replaced with NVRAM drives.

Steps

1. Align the drive with the guides in the slot.
2. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
3. Push the orange button until the drive is fully seated in the slot.
4. Push the latch down until it locks into place.

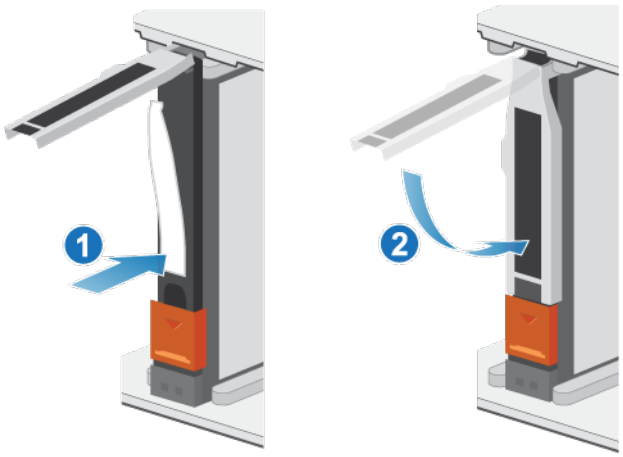


Figure 57. Installing a 2.5" drive

5. If you are installing an NVMe NVRAM drive, push the latch cover into place.

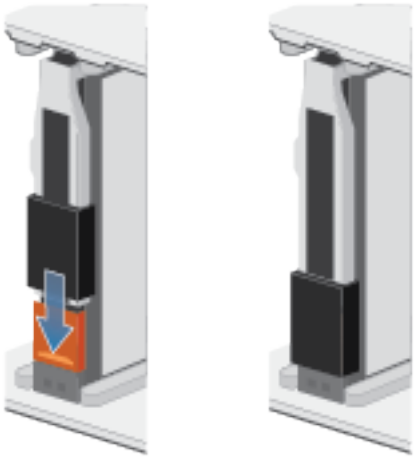


Figure 58. Pushing the latch cover into place

The activity light flashes to indicate that the spin-up sequence has begun.

Verify the operation of an added drive

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you added the drive.
3. On the **Components** card, under **Drives**, expand **BaseEnclosure** and select the drive.
   The status of the drive should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the drive is correctly seated, or contact your service provider.

Replace an AC power supply

Take the following actions to remove the faulted power supply and install the replacement power supply into the system.

Identify a faulted power supply from PowerStore Manager

Before you replace a power supply, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted power supply.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the power supply that you need to replace.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the power supply, and then select **PSU0**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Base enclosure power supply LEDs

Use the fault LEDs to identify the faulted part.

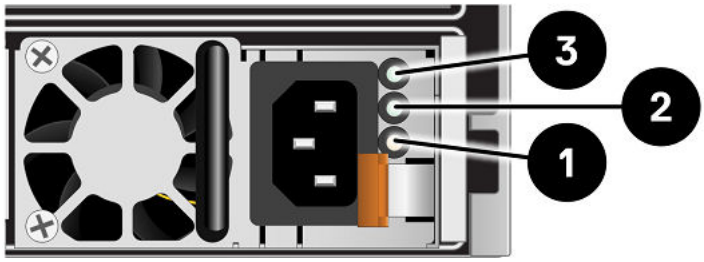


Figure 59. Base enclosure power supply LEDs

Table 7. Base enclosure AC power supply LEDs

LED	Location	State	Description
Fault	1	Solid amber	Power supply or backup fault. Check the cable connection.
		Off	There is no fault.
Supply output status	2	Green	Outputs are normal.
		Off	Outputs are faulted or disabled.
AC power (input)	3	Green	AC power is on.
		Off	AC power is off. Verify the power source.

Remove a power supply

About this task

There are two power supplies. The power supplies are installed in the top and bottom nodes, and the top power supply is installed upside-down. This procedure works for removing either power supply, however, the direction in which the retention bail and release handle are pressed is reversed for the upside-down power supply.

NOTE: You do not need to power off the system to remove a power supply.

Steps

1. Rotate the power cable retention bail to the left (to the right for the upside-down power supply). Remove the power cable from the power supply.

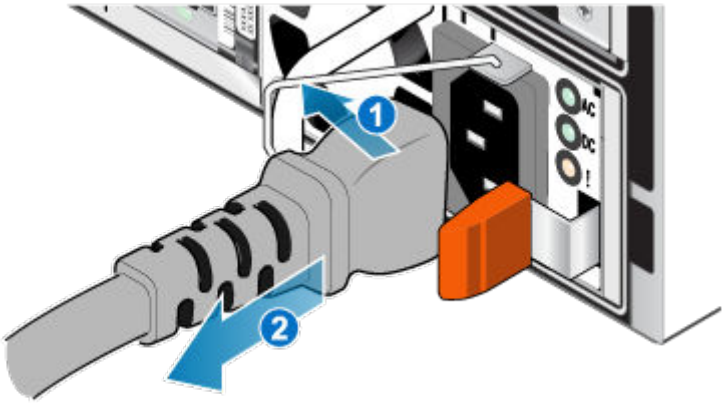


Figure 60. Removing the power cable

2. Push and hold the orange release tab to the left (to the right for the upside-down power supply) and grasp the power supply by its handle. Remove the power supply by pulling it from the node.

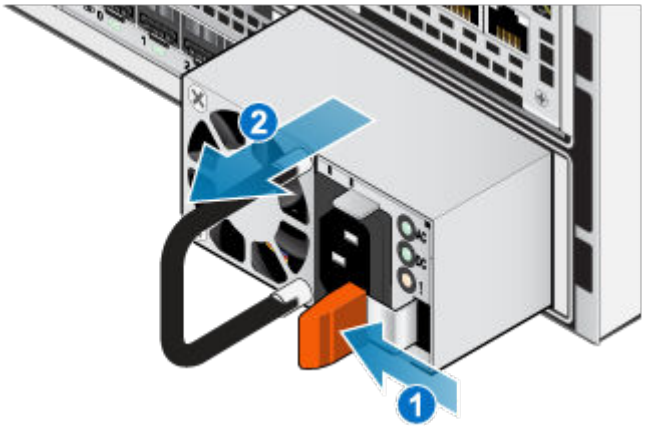


Figure 61. Removing a power supply

Install a power supply

About this task

The power supplies are installed in the top and bottom nodes, meaning that the top power supply is installed upside-down. This procedure works for installing either power supply.

Steps

1. Align the power supply with the slot in the node.
2. Push the power supply into the node until it clicks into place.

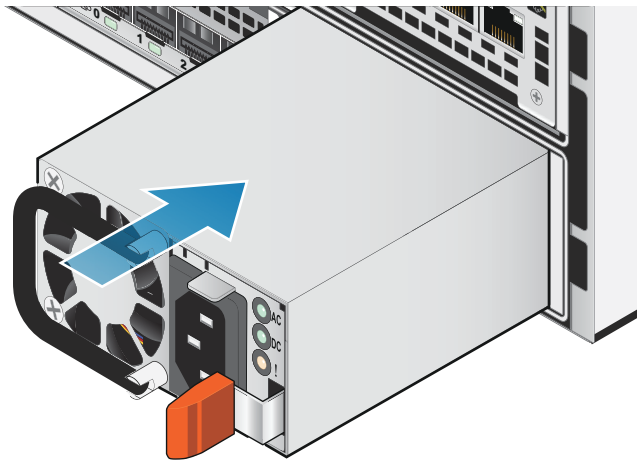


Figure 62. Installing a power supply

3. Connect the power cable to the power supply and secure the cord with the retention bail at the connector.

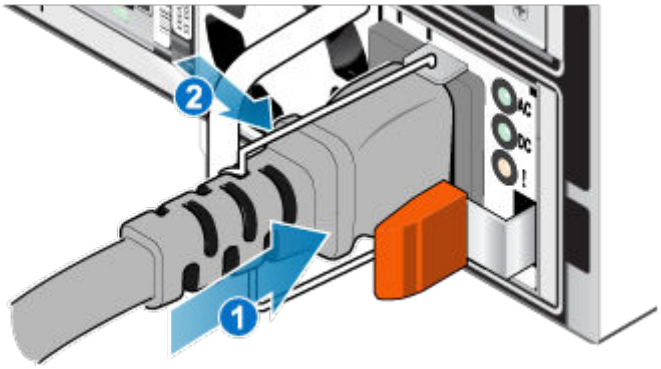


Figure 63. Inserting the power cable

Verify the operation of a replacement power supply

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the power supply.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the power supply, and then select **PSU0**.

   The status of the replacement power supply should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the power supply is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.

2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace an embedded module

Take the following actions to remove the faulted embedded module and install the replacement embedded module into the system.

Before you begin

CAUTION: Before starting this procedure, use the PowerStore Manager Hardware view and Alerts view to verify that the appliance and peer node are healthy with no outstanding alerts. If multiple nodes need to be removed while performing this procedure, repeat this verification for each affected node before proceeding to remove the next node. If necessary, contact your service provider before starting the replacement procedure.

Identify a faulted embedded module from PowerStore Manager

Before you replace an embedded module, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted embedded module.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the embedded module that you need to replace.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the embedded module, and then select **EmbeddedModule**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Embedded module LEDs

Use the fault LEDs to identify the faulted part.

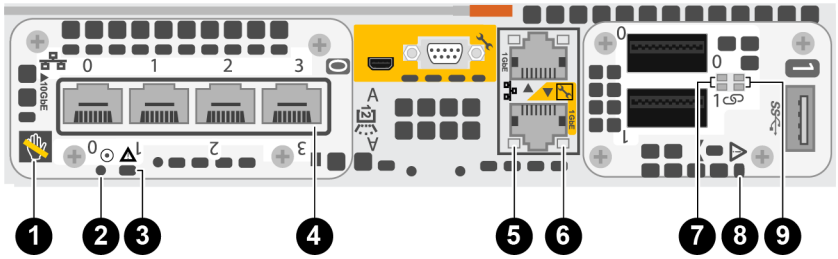


Figure 64. Embedded module LEDs

Table 8. Embedded module LEDs

LED	Location	State	Description
Unsafe to remove	1	White	Do not remove the node. Improper removal could cause data loss.

Table 8. Embedded module LEDs (continued)

LED	Location	State	Description
		Off	Safe to remove the node when the node has been properly prepared.
Node power	2	Green	Node is on (main power).
		Green blinking	Node is initializing a serial over LAN session.
		Off	Node is off.
Node fault	3	Amber	A fault has occurred.
		Blue	Node in Degraded Mode.
		Amber or blue blinking	The system is booting.
		Blue and amber alternating (green for 3 seconds)	The system is uninitialized. A management IP address has not been assigned.
		Blue and amber alternating at one second intervals	Node in Service Mode.
Port link	4	Green	The link is up with high speed.
		Amber	The link is up with degraded speed.
		Off	The link is down.
Ethernet port activity	5	Amber blinking	There is port activity.
		Off	There is no port activity.
Ethernet port link	6	Green	There is a link established.
		Off	There is no link established.
2-port 100GbE card port activity	7	Green blinking	There is port activity.
		Off	There is no port activity.
Embedded module fault	8	Amber	The Embedded module has faulted.
		Off	No fault has occurred. The system is operating normally.
2-port 100GbE card port link	9	Green	There is a link established.
		Off	There is no link established.

Power down the node

Power down the node as described in Power control procedures.

Remove a faulted embedded module

Steps

1. Label and disconnect all cables that are attached to the embedded module.

   CAUTION: Do not pull the node from the base enclosure. Pulling the node from the base enclosure disrupts the system cache.

2. Push the orange tab on the embedded module to release the lever.

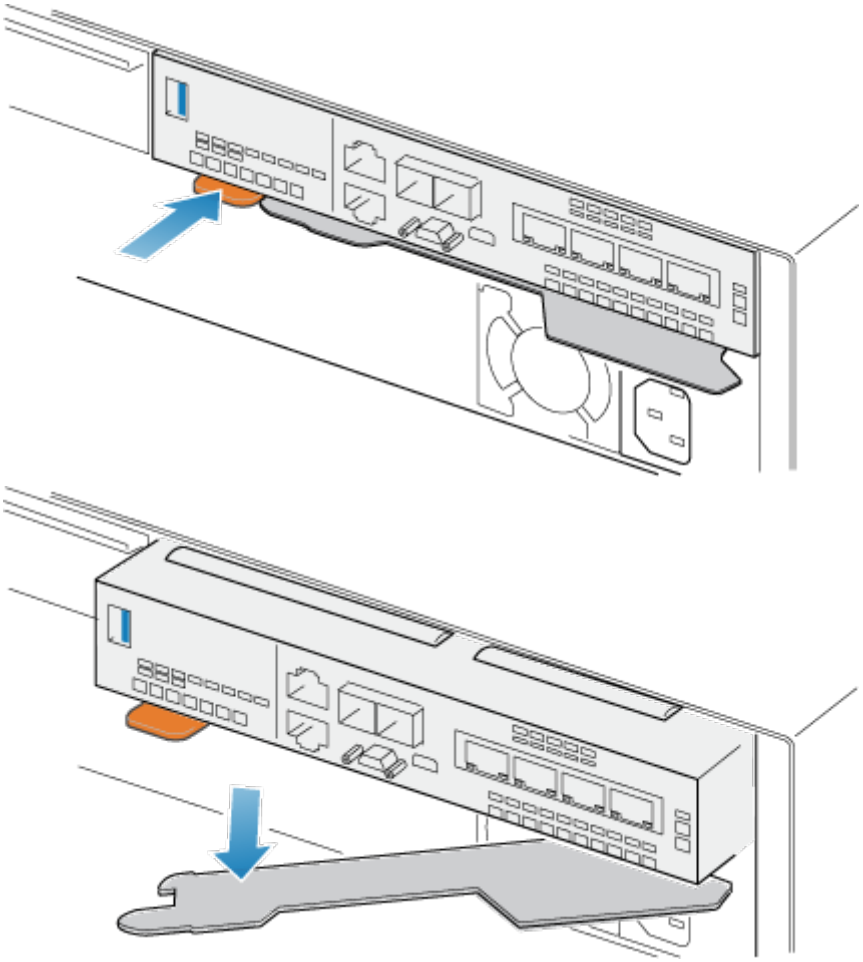


Figure 65. Releasing the lever on the embedded module

3. Pull the release lever away from the system. The embedded module releases from the system as you pull the lever.

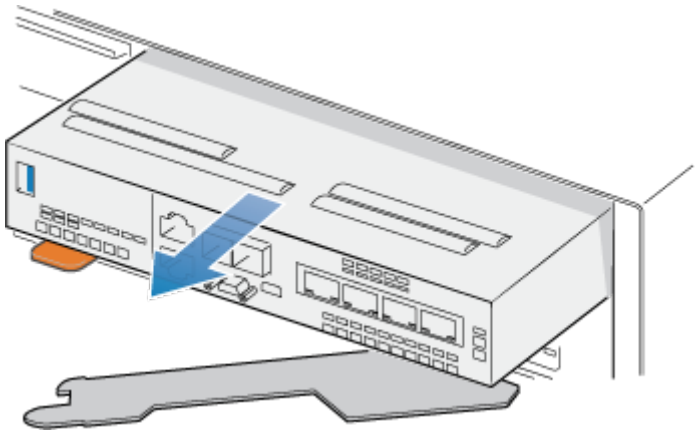


Figure 66. Removing the embedded module from the system

4. Remove the embedded module from the slot.

Transfer the 4-port card

If you are replacing the embedded module, remove the 4-port card from the old embedded module and install it into the new embedded module. Do not transfer the 4-port card while replacing a node.

Remove a 4-port card

Steps

1. Remove the SFPs from the front of the embedded module.
2. Remove both air dams at the front of the embedded module by loosening the captive screws.
3. Push down the two blue tabs on the back of the 4-port card to release the 4-port card.

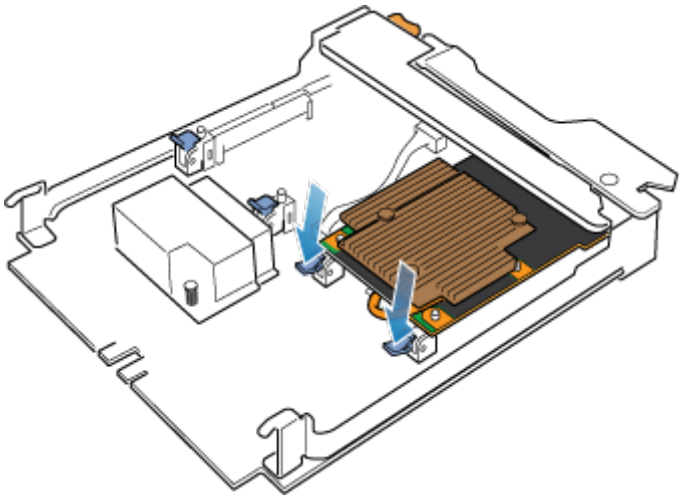


Figure 67. Opening the retaining tabs

4. Lift the 4-port card off the pegs, and pull the 4-port card away from the embedded module.

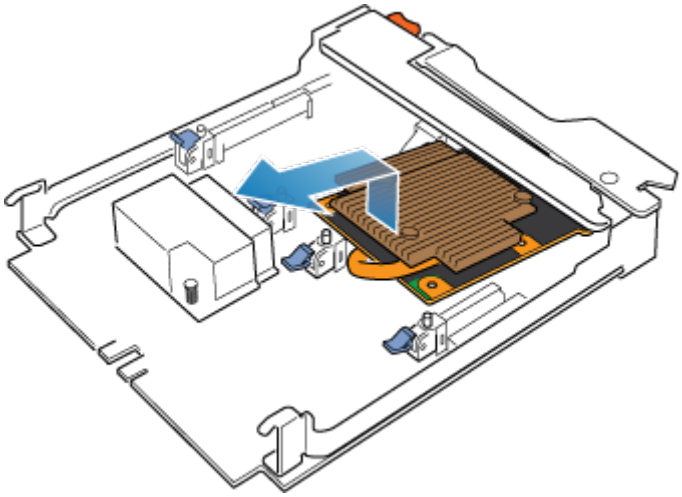


Figure 68. Removing the 4-port card

Install a 4-port card

Steps

1. Align the 4-port card in the embedded module so that the ports on the front line up with the slots on the front of the embedded module.

2. Align the white pegs beneath the holes on the 4-port card.

CAUTION: Do not force the 4-port card into place. If the 4-port card does not smoothly seat, realign the pegs and try again.

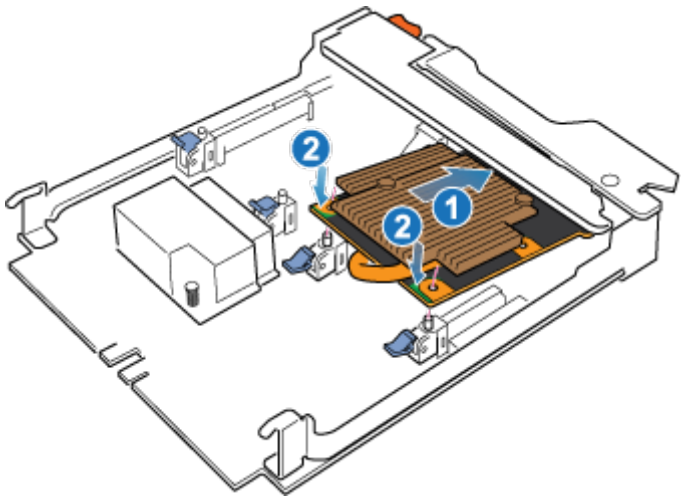


Figure 69. Seating the 4-port card

3. Gently push down on the upper-left circle on the 4-port card.
4. Push up on the blue tabs until they lock into place.

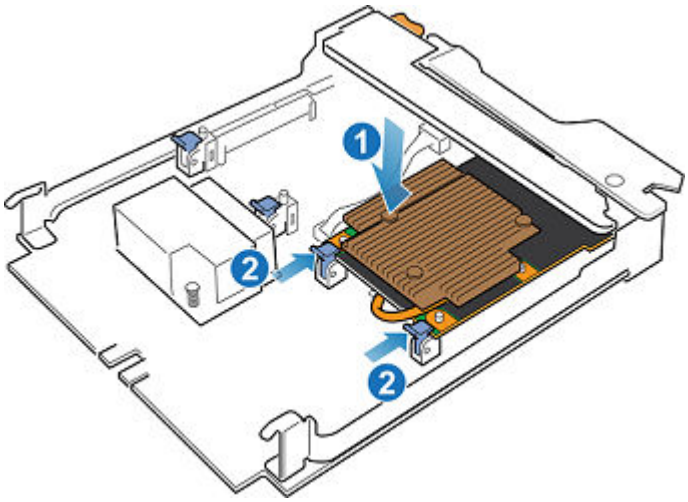


Figure 70. Locking the 4-port card into position

5. Replace both air dams and tighten the captive screws.
6. Install the SFPs into the embedded module.

Install an embedded module

Steps

1. Align the embedded module with the empty slot and carefully push it into the slot.

   As the embedded module is installed, the release lever rotates inward.

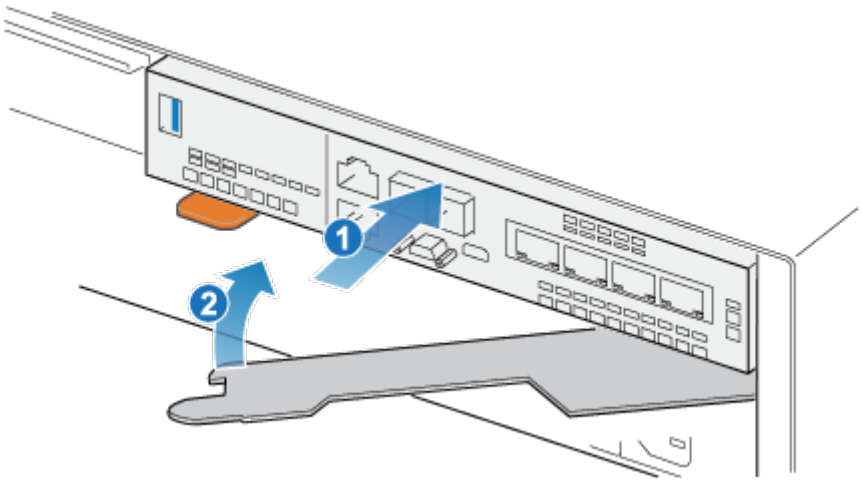


Figure 71. Installing the embedded module

2. When the embedded module is fully seated, push the release lever back into the system until the orange tab locks the lever in place.

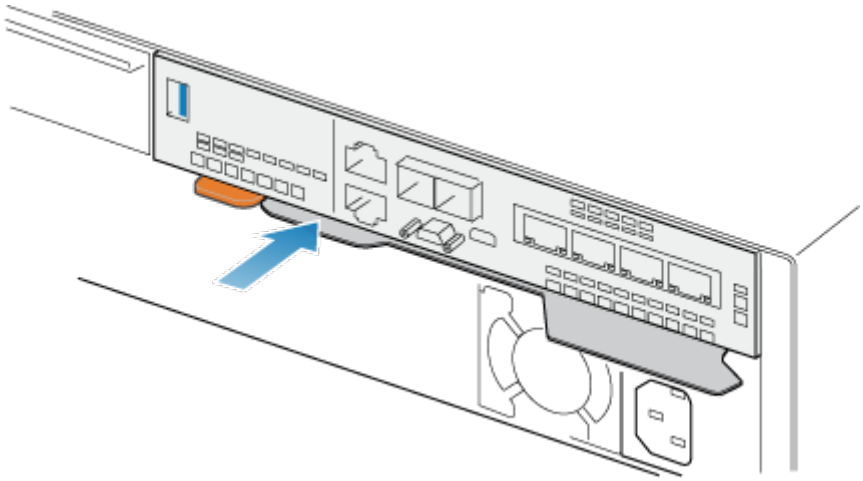


Figure 72. Locking the release lever

3. Connect each cable into the same port from which it was removed.

Power up the node

Power up the node as described in Power control procedures.

Verify the operation of a replacement embedded module

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the embedded module.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the embedded module, and then select **EmbeddedModule**.

   The status of the replacement embedded module should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the embedded module is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a 4-port card

Take the following actions to remove the 4-port card and install the replacement 4-port card into the system.

Before you begin

CAUTION: Before starting this procedure, use the PowerStore Manager Hardware view and Alerts view to verify that the appliance and peer node are healthy with no outstanding alerts. If multiple nodes need to be removed while performing this procedure, repeat this verification for each affected node before proceeding to remove the next node. If necessary, contact your service provider before starting the replacement procedure.

Identify a faulted 4-port card from PowerStore Manager

Before you replace a 4-port card, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted 4-port card.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the 4-port card that you need to replace.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the 4-port card, expand **EmbeddedModule**, and then select **4PortCard**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Embedded module LEDs

Use the fault LEDs to identify the faulted part.

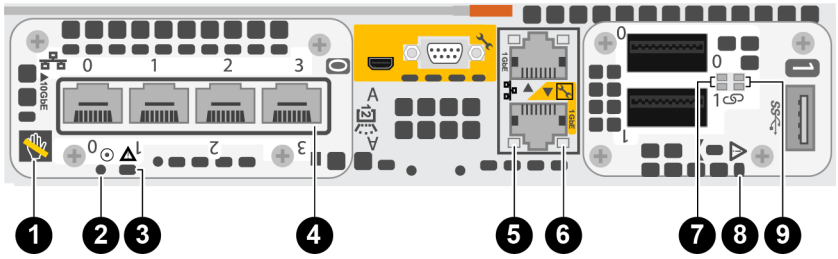


Figure 73. Embedded module LEDs

Table 9. Embedded module LEDs

LED	Location	State	Description
Unsafe to remove	1	White	Do not remove the node. Improper removal could cause data loss.
		Off	Safe to remove the node when the node has been properly prepared.
Node power	2	Green	Node is on (main power).
		Green blinking	Node is initializing a serial over LAN session.
		Off	Node is off.
Node fault	3	Amber	A fault has occurred.
		Blue	Node in Degraded Mode.
		Amber or blue blinking	The system is booting.
		Blue and amber alternating (green for 3 seconds)	The system is uninitialized. A management IP address has not been assigned.
		Blue and amber alternating at one second intervals	Node in Service Mode.
Port link	4	Green	The link is up with high speed.
		Amber	The link is up with degraded speed.
		Off	The link is down.
Ethernet port activity	5	Amber blinking	There is port activity.
		Off	There is no port activity.
Ethernet port link	6	Green	There is a link established.
		Off	There is no link established.
2-port 100GbE card port activity	7	Green blinking	There is port activity.
		Off	There is no port activity.
Embedded module fault	8	Amber	The Embedded module has faulted.
		Off	No fault has occurred. The system is operating normally.
2-port 100GbE card port link	9	Green	There is a link established.

Table 9. Embedded module LEDs (continued)

LED	Location	State	Description
		Off	There is no link established.

Power down the node

Power down the node as described in Power control procedures.

Remove an embedded module

Steps

1. Label and disconnect all cables that are attached to the embedded module.

   CAUTION: Do not pull the node from the base enclosure. Pulling the node from the base enclosure disrupts the system cache.

2. Push the orange tab on the embedded module to release the lever.

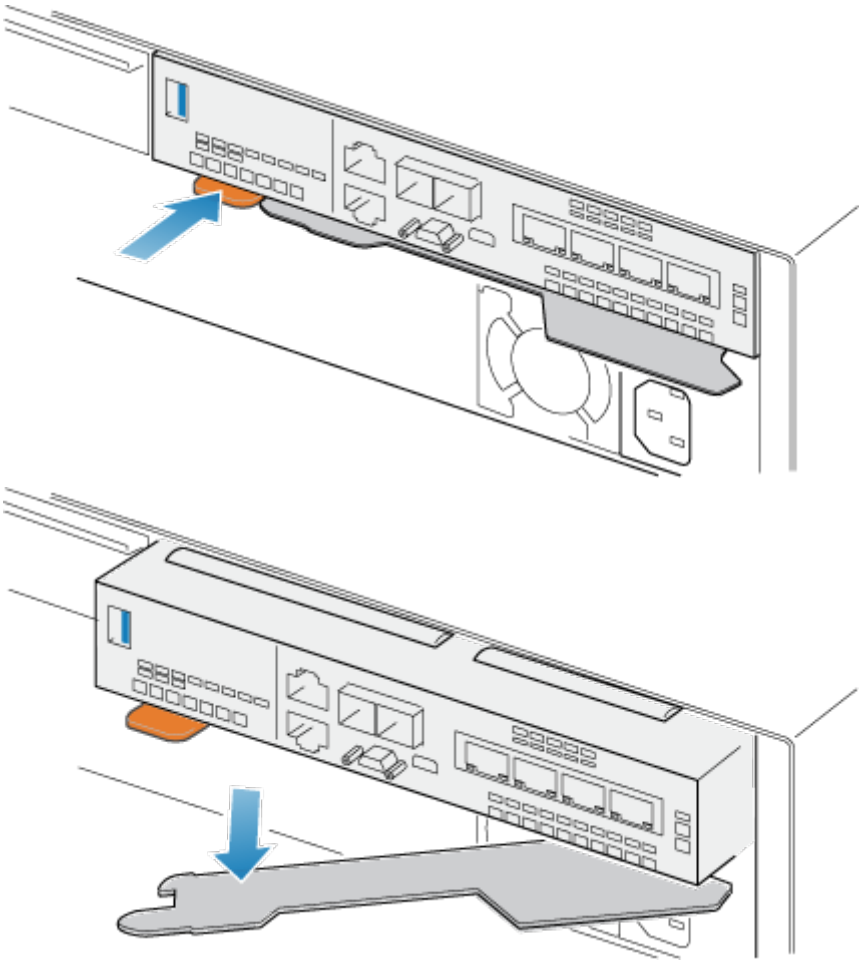


Figure 74. Releasing the lever on the embedded module

3. Pull the release lever away from the system. The embedded module releases from the system as you pull the lever.

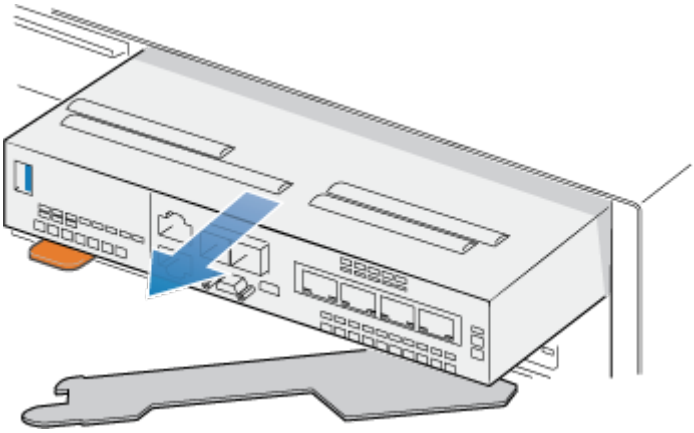


Figure 75. Removing the embedded module from the system

4. Remove the embedded module from the slot.

Remove a 4-port card

Steps

1. Remove the SFPs from the front of the embedded module.
2. Push down the two blue tabs on the back of the 4-port card to release the 4-port card.

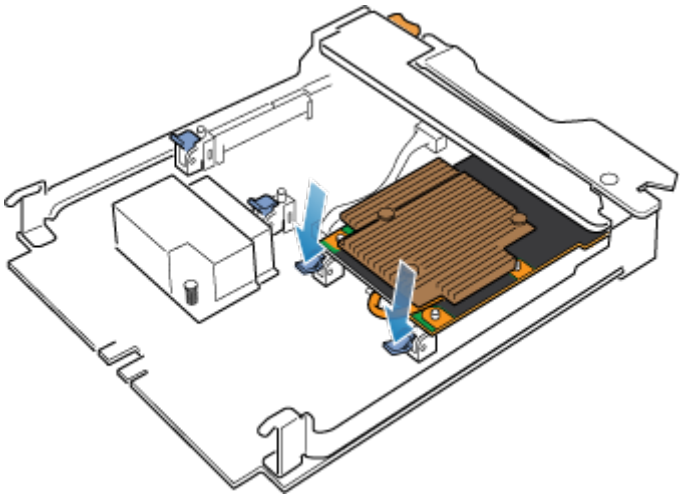


Figure 76. Opening the retaining tabs

3. Lift the 4-port card off the pegs, and pull the 4-port card away from the embedded module.

NOTE: If you are having difficulty removing the 4-port card, loosen the four captive screws that secure the air dam to the front of the embedded module .

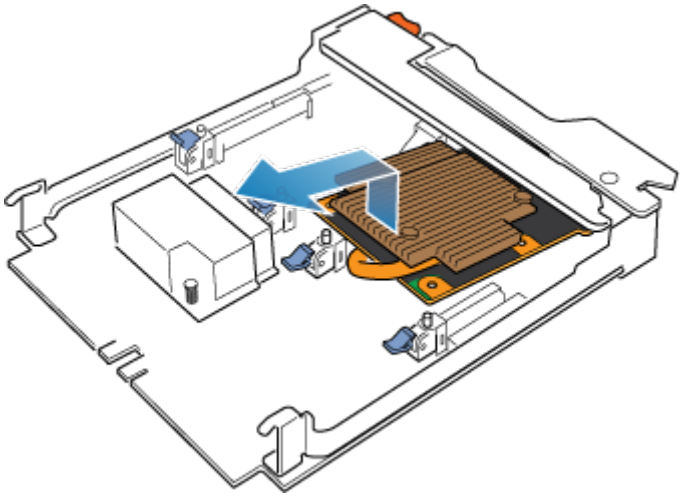


Figure 77. Removing the 4-port card

Install a 4-port card

Steps

1. Align the 4-port card in the embedded module so that the ports on the front line up with the slots on the front of the embedded module.
2. Align the white pegs beneath the holes on the 4-port card.

CAUTION: Do not force the 4-port card into place. If the 4-port card does not smoothly seat, realign the pegs and try again.

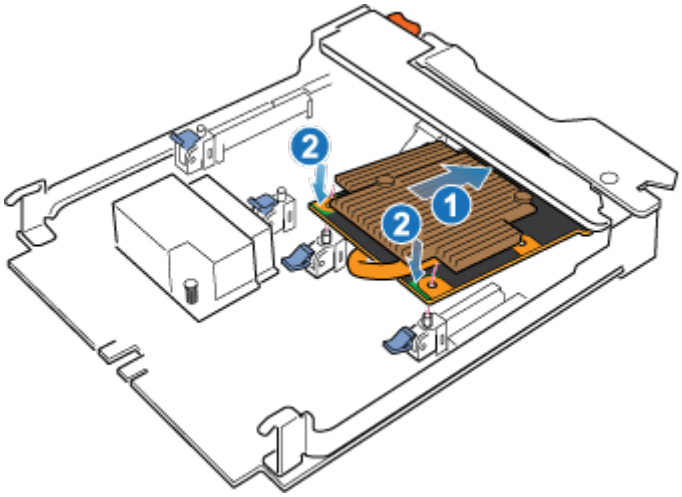


Figure 78. Seating the 4-port card

3. Gently push down on the upper-left circle on the 4-port card.
4. Push up on the blue tabs until they lock into place.

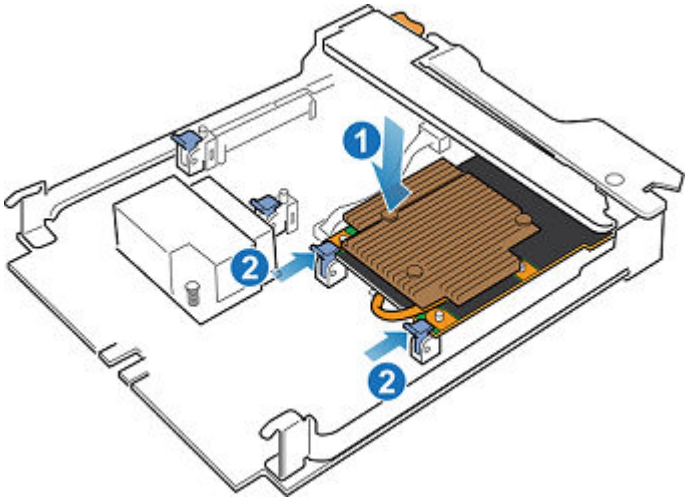


Figure 79. Locking the 4-port card into position

5. If necessary, tighten the four captive screws that secure the air dam to the front of the embedded module.
6. Install the SFPs into the embedded module.

Install an embedded module

Steps

1. Align the embedded module with the empty slot and carefully push it into the slot.

   As the embedded module is installed, the release lever rotates inward.

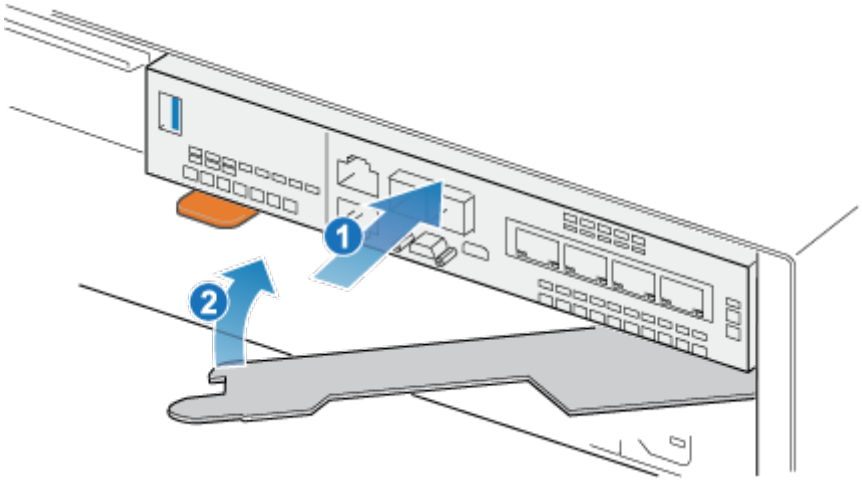


Figure 80. Installing the embedded module

2. When the embedded module is fully seated, push the release lever back into the system until the orange tab locks the lever in place.

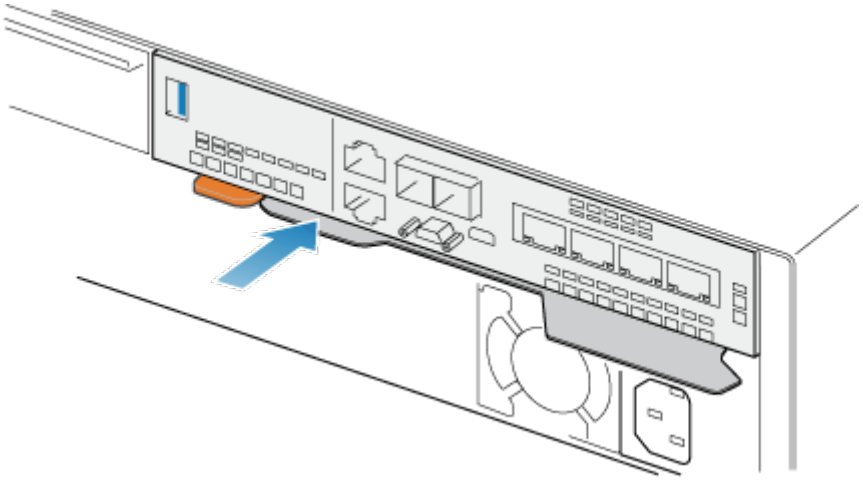


Figure 81. Locking the release lever

3. Connect each cable into the same port from which it was removed.

Power up the node

Power up the node as described in Power control procedures.

Verify the operation of a new 4-port card

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the 4-port card.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the 4-port card, expand **EmbeddedModule**, and then select **4PortCard**.

   The status of the replacement 4-port card should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the embedded module and 4-port card are correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a 2-port 100GbE card

Take the following actions to remove a faulted 2-port 100GbE card and install the replacement 2-port 100GbE card into the system.

Before you begin

CAUTION: Before starting this procedure, use the PowerStore Manager Hardware view and Alerts view to verify that the appliance and peer node are healthy with no outstanding alerts. If multiple nodes need to be removed while performing this procedure, repeat this verification for each affected node before proceeding to remove the next node. If necessary, contact your service provider before starting the replacement procedure.

Identify a faulted 2-port 100GbE card from PowerStore Manager

Before you replace a 2-port 100GbE card, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted 2-port 100GbE card.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the 2-port 100GbE card that you need to replace.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the 2-port 100GbE card, expand **EmbeddedModule**, and then select **2PortCard**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Embedded module LEDs

Use the fault LEDs to identify the faulted part.

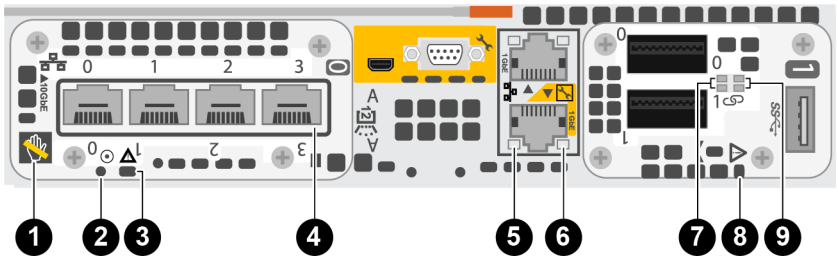


Figure 82. Embedded module LEDs

Table 10. Embedded module LEDs

LED	Location	State	Description
Unsafe to remove	1	White	Do not remove the node. Improper removal could cause data loss.
		Off	Safe to remove the node when the node has been properly prepared.
Node power	2	Green	Node is on (main power).
		Green blinking	Node is initializing a serial over LAN session.
		Off	Node is off.
Node fault	3	Amber	A fault has occurred.

Table 10. Embedded module LEDs (continued)

LED	Location	State	Description
		Blue	Node in Degraded Mode.
		Amber or blue blinking	The system is booting.
		Blue and amber alternating (green for 3 seconds)	The system is uninitialized. A management IP address has not been assigned.
		Blue and amber alternating at one second intervals	Node in Service Mode.
Port link	4	Green	The link is up with high speed.
		Amber	The link is up with degraded speed.
		Off	The link is down.
Ethernet port activity	5	Amber blinking	There is port activity.
		Off	There is no port activity.
Ethernet port link	6	Green	There is a link established.
		Off	There is no link established.
2-port 100GbE card port activity	7	Green blinking	There is port activity.
		Off	There is no port activity.
Embedded module fault	8	Amber	The Embedded module has faulted.
		Off	No fault has occurred. The system is operating normally.
2-port 100GbE card port link	9	Green	There is a link established.
		Off	There is no link established.

Power down the node

Power down the node as described in Power control procedures.

Remove an embedded module

Steps

1. Label and disconnect all cables that are attached to the embedded module.

   CAUTION: Do not pull the node from the base enclosure. Pulling the node from the base enclosure disrupts the system cache.

2. Push the orange tab on the embedded module to release the lever.

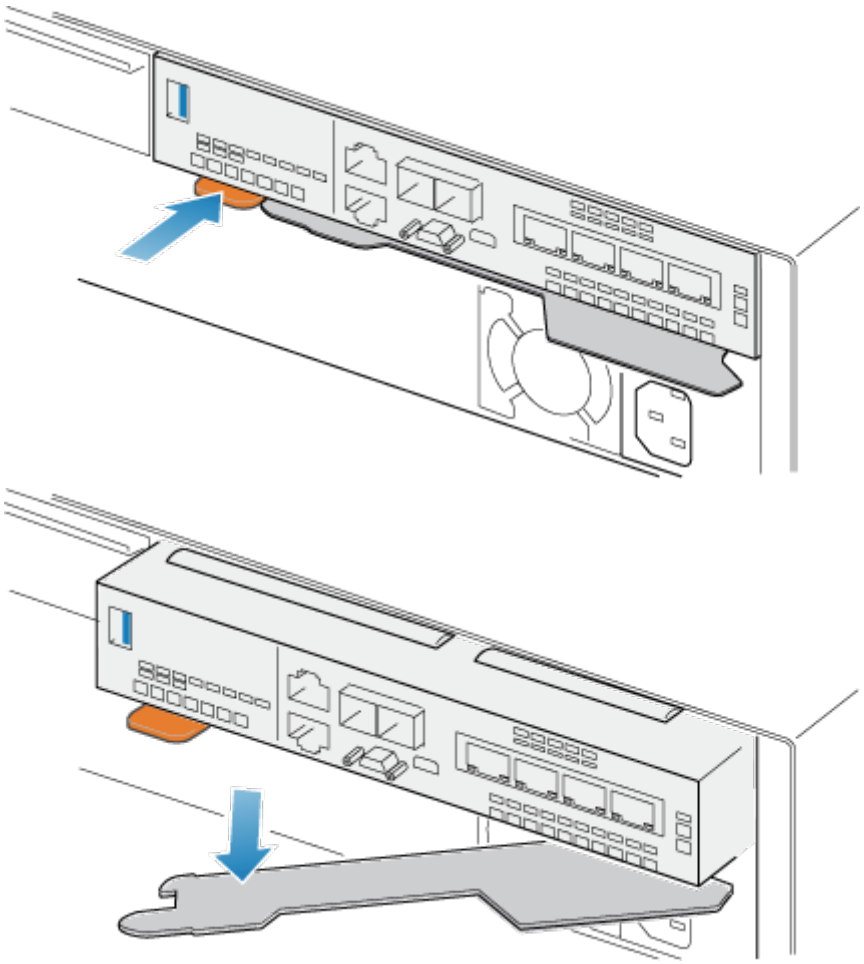


Figure 83. Releasing the lever on the embedded module

3. Pull the release lever away from the system. The embedded module releases from the system as you pull the lever.

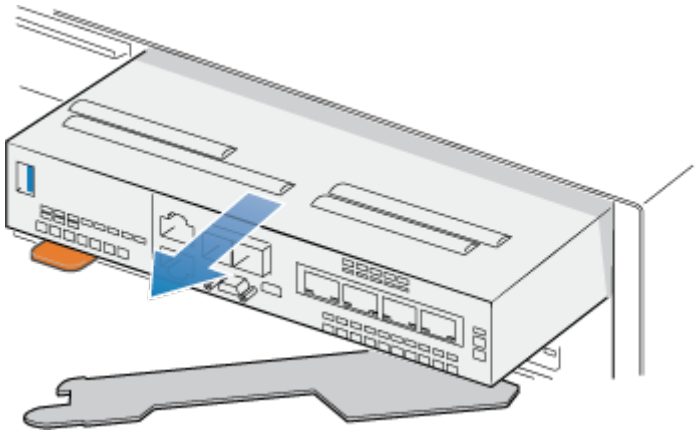


Figure 84. Removing the embedded module from the system

4. Remove the embedded module from the slot.

Remove a 2-port 100GbE card

Steps

1. Remove the SFPs from the front of the 2-port 100GbE card.

2. Push down the two blue tabs on the back of the 2-port 100GbE card to release the 2-port 100GbE card.

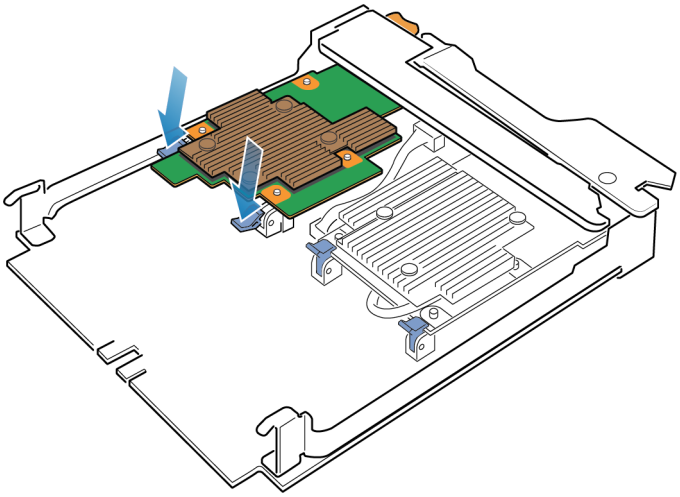


Figure 85. Opening the retaining tabs

3. Lift the 2-port 100GbE card off the pegs, and pull the 2-port 100GbE card away from the embedded module.

NOTE: If you are having difficulty removing the 2-port 100GbE card, loosen the captive screws that secure the air dam to the front of the embedded module .

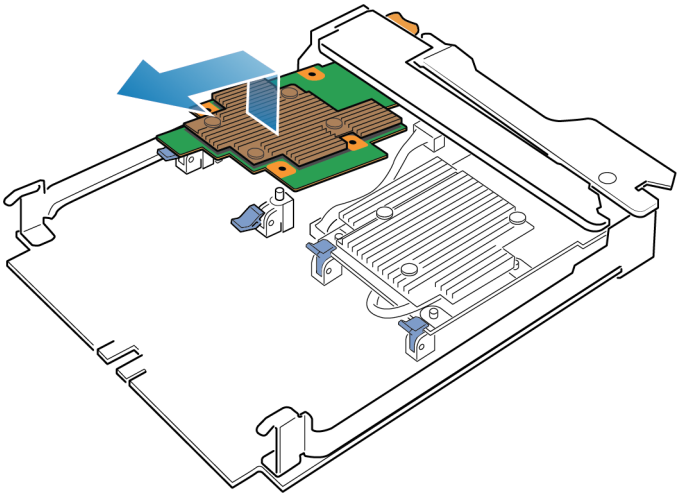


Figure 86. Removing the 2-port 100GbE card

Install a 2-port 100GbE card

Steps

1. Align the 2-port 100GbE card in the embedded module so that the ports on the front line up with the slots on the front of the embedded module.
2. Align the white pegs beneath the holes on the 2-port 100GbE card.

CAUTION: Do not force the 2-port 100GbE card into place. If the 2-port 100GbE card does not smoothly seat, realign the pegs and try again.

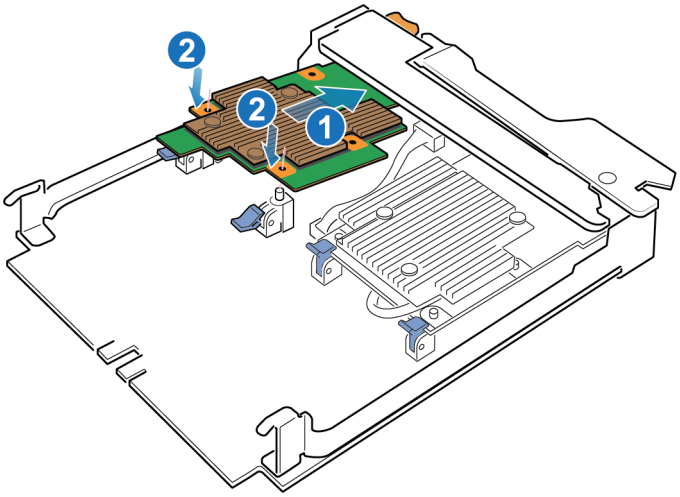


Figure 87. Seating the 2-port 100GbE card

3. Gently push down on the 2-port 100GbE card.
4. Push up on the blue tabs until they lock into place.

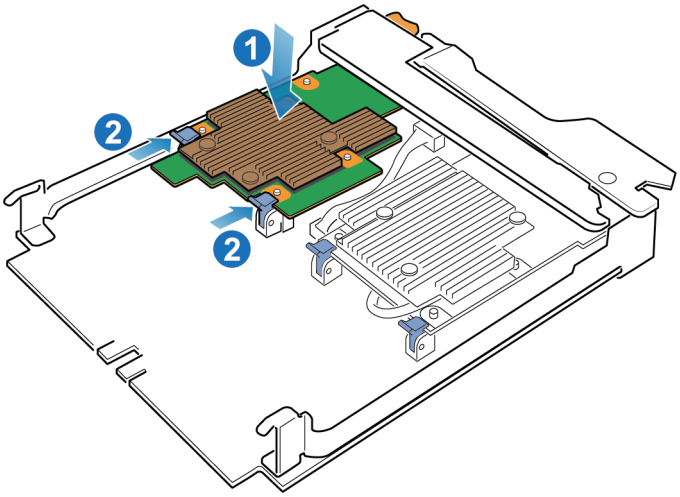


Figure 88. Locking the 2-port 100GbE card into position

5. Install the air dam and tighten the captive screws.
6. Install the SFPs into the embedded module.

Install an embedded module

Steps

1. Align the embedded module with the empty slot and carefully push it into the slot.

   As the embedded module is installed, the release lever rotates inward.

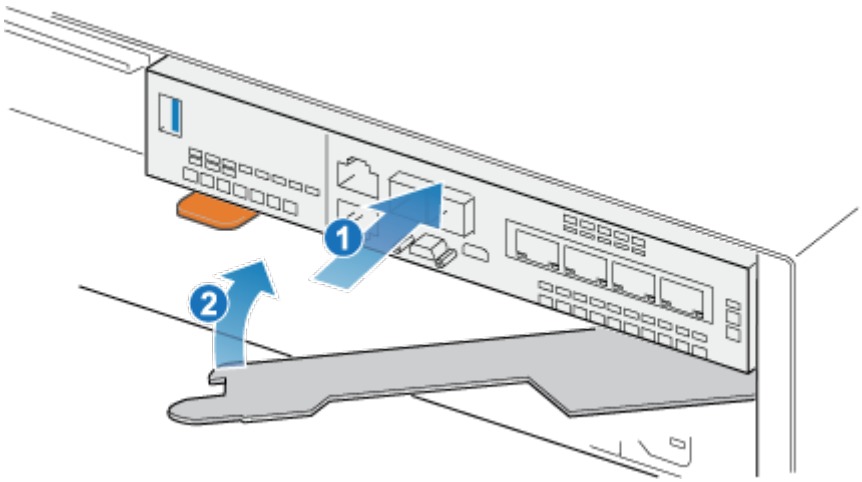


Figure 89. Installing the embedded module

2. When the embedded module is fully seated, push the release lever back into the system until the orange tab locks the lever in place.

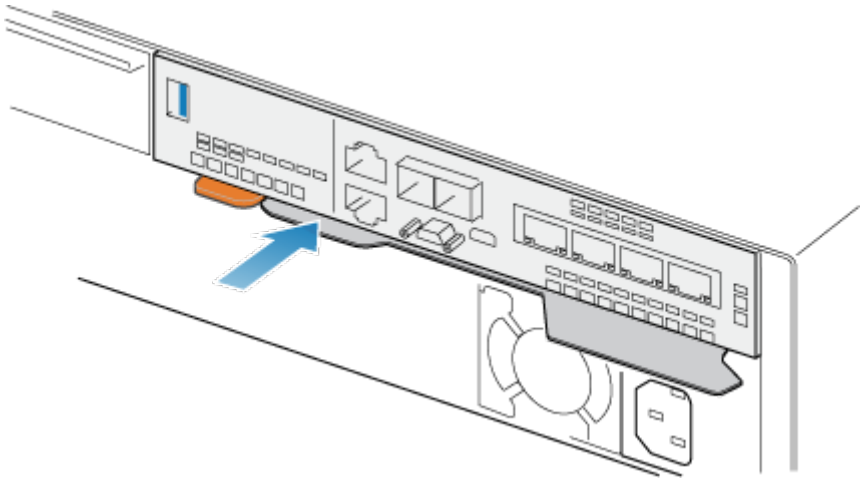


Figure 90. Locking the release lever

3. Connect each cable into the same port from which it was removed.

Power up the node

Power up the node as described in Power control procedures.

Verify the operation of a new 2-port 100GbE card

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you installed the card.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the card, expand **EmbeddedModule**, and then select **2PortCard**.

   The status of the replacement card should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the embedded module and card are correctly seated, or contact your service provider.

Replace an SFP

Take the following actions to remove the faulted SFP and install the replacement SFP into the system.

Identify a faulted SFP module from PowerStore Manager

Using PowerStore Manager, you can identify and locate a faulted SFP module.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that contains the SFP module that you need to replace.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the SFP module, and select the SFP module under either **4PortCard** or **IOModule**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.
5. The following error messages do not result in a fault, but they still indicate that the SFP should be replaced.
   - SFP speed mismatched: Indicates that the supported speeds of this SFP module are unsupported by the port.
   - SFP unsupported: Indicates that this SFP module is not qualified with this product.
   - SFP asymmetric: Indicates that this SFP module does not have the same supported speeds and connector type as its partner.

Remove an SFP module

Steps

1. If a cable is connected to the SFP, disconnect the cable.
2. Gently pull down on the spring release latch.
3. While still holding onto the latch, gently pull out the SFP module.

CAUTION: Do not remove the I/O module. Removing the I/O module causes the node to reboot immediately.

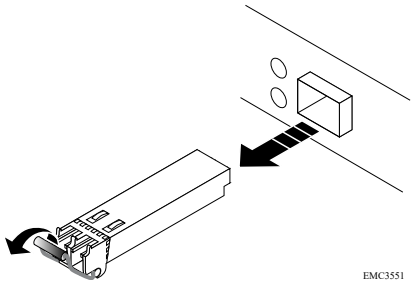


Figure 91. Removing an SFP module

Install an SFP module

Steps

1. Verify that the replacement SFP module has the same part number as the failed SFP module.
   The part number is on a label that is attached to the SFP module.
2. Push the spring release latch up and slide the new SFP module into the port until it is securely connected.

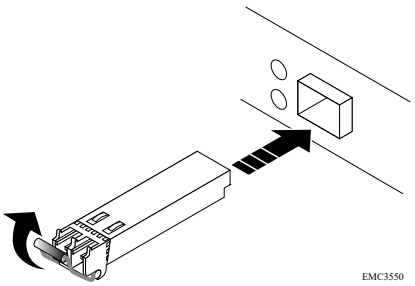


Figure 92. Installing an SFP module

3. Push the spring release down to lock the SFP module into place.
4. Reconnect the cable to the replacement SFP module.

Verify the operation of a replacement SFP module

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the SFP module.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the SFP module, and select the SFP module under either **4PortCard** or **IOModule**.
5. The status of the replacement SFP module should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the fault was indicated by one of the following error messages, verify that the error message is cleared:
   - SFP speed mismatched
   - SFP unsupported
   - SFP asymmetric

   If the status does not change or the error message is not cleared, ensure that the SFP module is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace an I/O module

Take the following actions to remove the faulted I/O module and install the replacement I/O module into the system.

Before you begin

CAUTION: Before starting this procedure, use the PowerStore Manager Hardware view and Alerts view to verify that the appliance and peer node are healthy with no outstanding alerts. If multiple nodes need to be removed while performing this procedure, repeat this verification for each affected node before proceeding to remove the next node. If necessary, contact your service provider before starting the replacement procedure.

Identify a faulted I/O module from PowerStore Manager

Before you replace an I/O module, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted I/O module.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the I/O module that you need to replace.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the I/O module, and then select the relevant **IoModule**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Base enclosure I/O module LEDs

Use the fault LEDs to identify the faulted part.

NOTE: The ports look different depending on whether they are for copper or optical connections. The image below shows ports for copper cables.

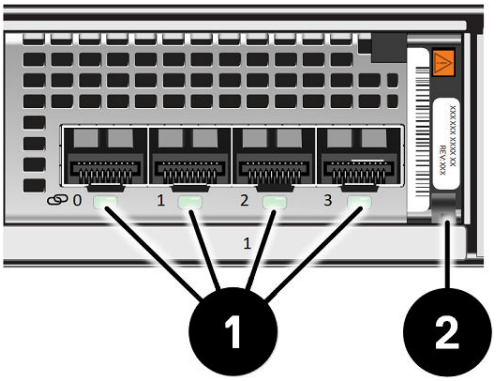


Figure 93. Base enclosure I/O module LEDs

Table 11. Base enclosure I/O module LEDs

LED	Location	State	Description
Port link	1	Green or blue	Link up
		Off	Link down
Power/Fault	2	Green	Power on
		Amber	Fault

Power down the node

Power down the node as described in Power control procedures.

Remove a faulted I/O module

Steps

1. Pull the trigger mechanism on the I/O module handle to release it.

   CAUTION: Do not pull the node from the base enclosure. Pulling the node from the base enclosure disrupts the system cache.

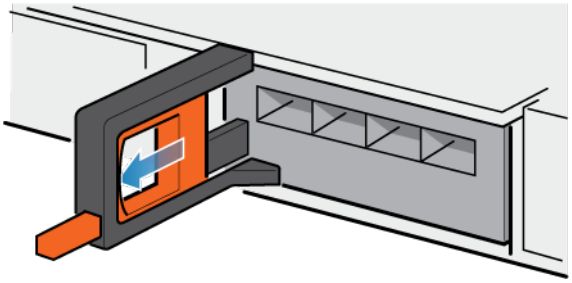


Figure 94. Releasing the I/O module

2. Gently pull the I/O module from the slot.

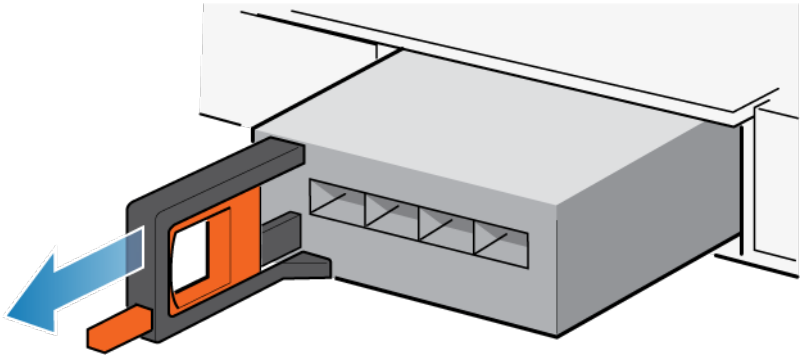


Figure 95. Removing the I/O module

Install an I/O module

Steps

1. Align the module with the empty slot and carefully push the module into the slot.

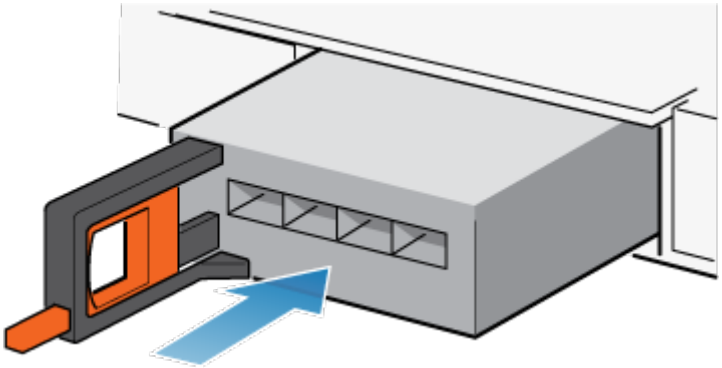


Figure 96. Installing an I/O module

2. When the I/O module appears seated, push and release the small button on the handle.

- If the button remains in, the module is fully seated.
- If the button springs back, gently push the module further into the chassis, then push it again.
- If the button still does not rest flush with its handle, remove the module and repeat steps 1 and 2.

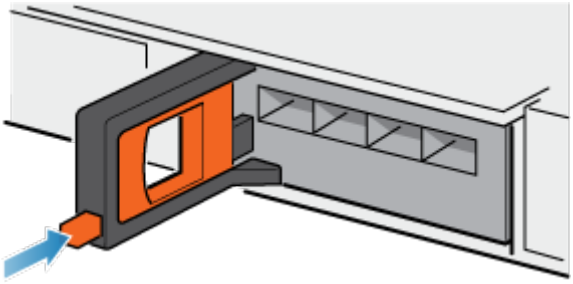


Figure 97. Locking the I/O module into place

3. Connect the cables into the assigned I/O module ports.

Power up the node

Power up the node as described in Power control procedures.

Verify the operation of a replacement I/O module

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the I/O module.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Expand the node that includes the I/O module, and then select the relevant **IoModule**.
   The status of the replacement I/O module should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the I/O module is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a fan module

Take the following actions to remove the faulted fan module and install the replacement fan module into the system.

Before you begin

CAUTION: Before starting this procedure, use the PowerStore Manager Hardware view and Alerts view to verify that the appliance and peer node are healthy with no outstanding alerts. If multiple nodes need to be removed while performing this procedure, repeat this verification for each affected node before proceeding to remove the next node. If necessary, contact your service provider before starting the replacement procedure.

Identify a faulted fan module from PowerStore Manager

Before you replace a fan module, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted fan module.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the fan module that you need to replace.
3. On the **Components** card, under **Internal View**, expand the node that includes the fan module, and then select the relevant **FanModule**.

   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Power down the node

Power down the node as described in Power control procedures.

Remove the node

This procedure describes how to remove a node from the chassis. There are two nodes. The top node is considered to be upside-down and mirrors the bottom node. The procedure for removing the top node and the bottom node is the same.

Prerequisites

If the I/O modules and network cables are not already labeled, label them clearly for reconnecting later.

About this task

WARNING: Do not remove the node within five minutes of system power off to ensure that the system has had time to complete caching.

CAUTION: Do not remove a node while the "Unsafe to remove" LED is lit. If the LED is lit, the peer node has been powered off or is offline and this node should not be removed.

CAUTION: Because nodes include cooling fans, they should be removed for as short a time as possible. Do not remove nodes from a live system unless replacement parts are available.

Steps

1. Rotate the power cable retention bail to the left (right for top power supply). Disconnect the power cable from the power supply.

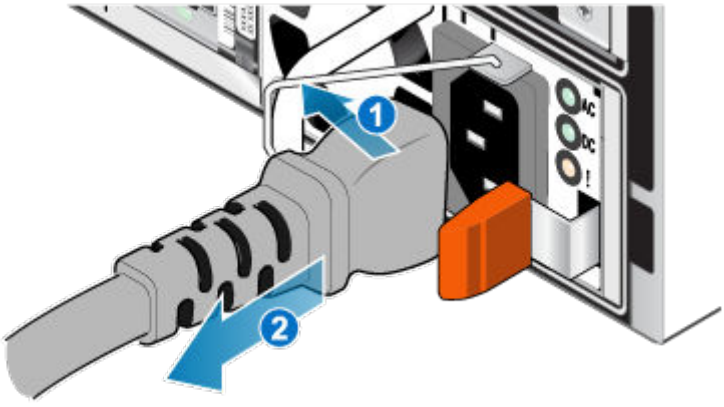


Figure 98. Removing the power cable

2. Disconnect the network and all other cables from the back of the I/O modules and network ports on the node.

   NOTE: Label the cables before you remove them.

   NOTE: Do not remove any cables from the other node.

3. If the node has a node ID plug on the node handle, remove the node ID plug.
4. Pull the orange release trigger while gently pushing in on the node.

   The hook disengages from the locking mechanism, and the release tab slides out.

   NOTE: The node comes completely out of the chassis. Be prepared to support the node to avoid dropping it.

   NOTE: The release trigger and handle for node B is on the upper left. The release trigger and handle for node A is on the bottom right.

   CAUTION: Removing the incorrect node leads to loss of system power and cached data will be lost.

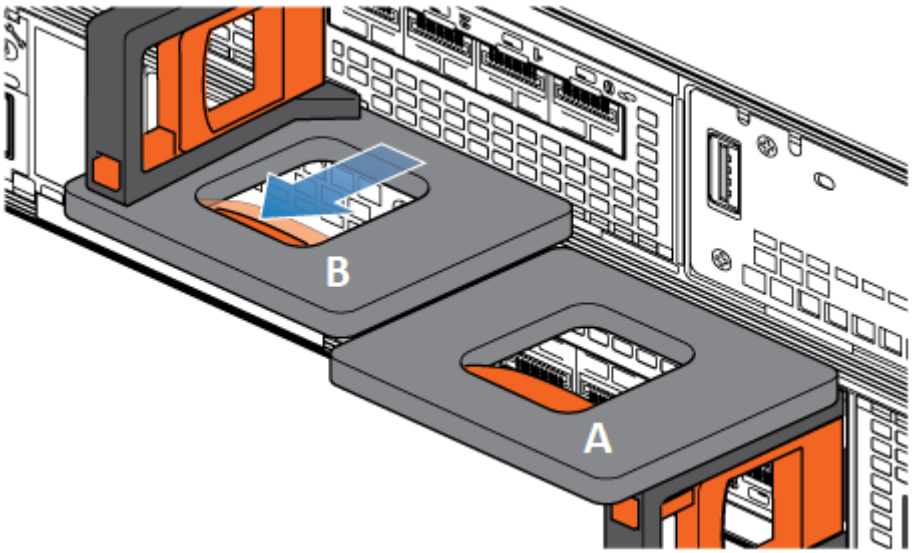


Figure 99. Disengaging the locking mechanism for node B

5. Before removing the node, ensure that the wire bail is properly secured to the power supply cable of the other node to prevent accidental loss of power and cache.
6. Use the release handle to pull the node outward enough to grasp the sides with both hands. Then, with both hands supporting the node, pull the node fully out of the enclosure.

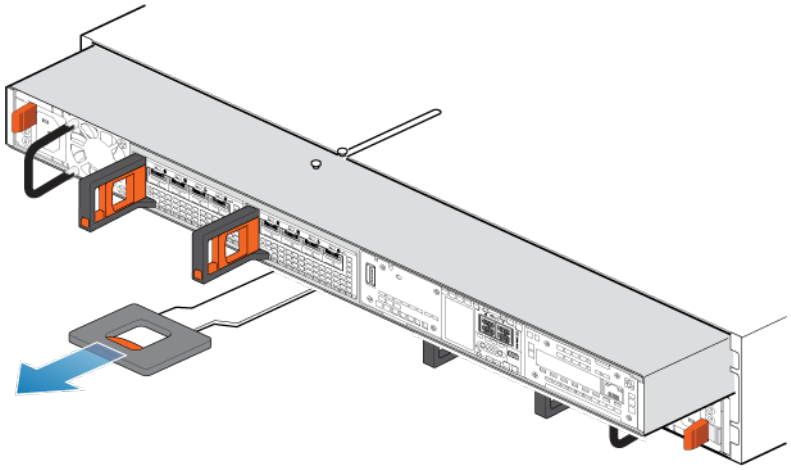


Figure 100. Removing the node

7. Place the node on a clean, flat, static-free work surface.

Remove the top cover from the node

Steps

1. While pushing down the two blue release buttons, slide the top cover towards the rear of the system, until it stops.

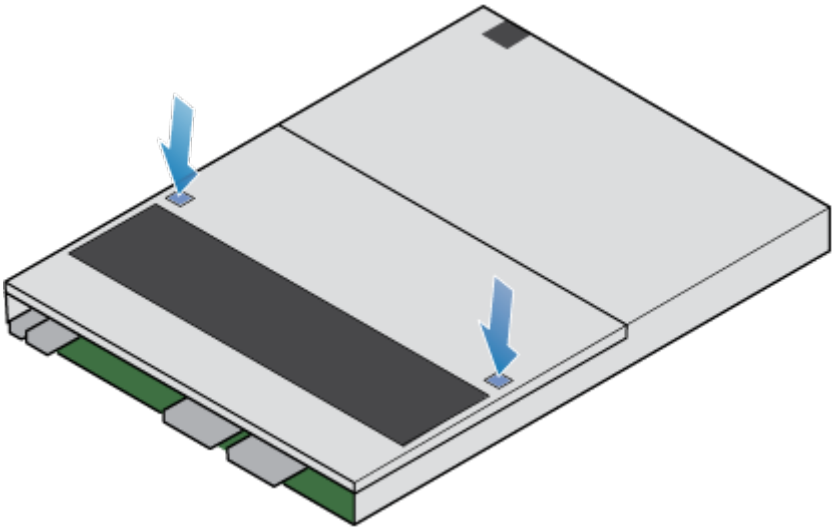


Figure 101. Releasing the top cover

2. Lift the top cover upward, and remove it from the node.

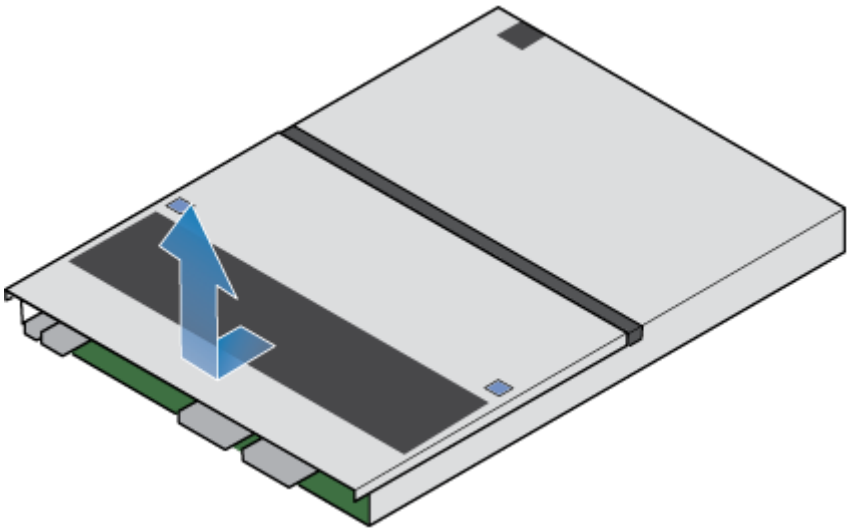


Figure 102. Removing the top cover

Remove the fan module

Steps

1. Disconnect the fan module power cable from the motherboard.

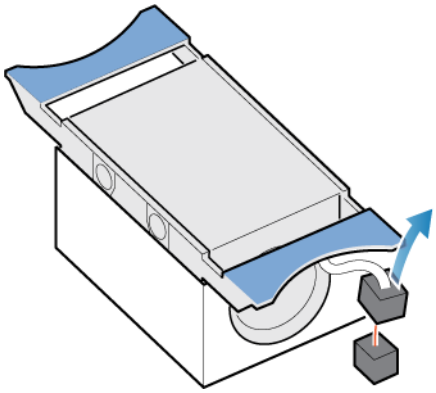


Figure 103. Disconnecting the fan power cable

2. Unhook the fan module power cable from the cable holder.
3. Squeeze the blue release tabs.
4. Lift the fan module away from the motherboard.

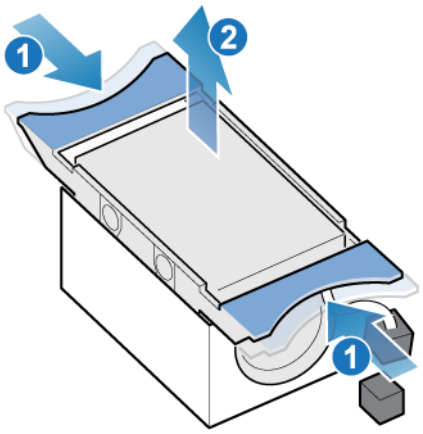


Figure 104. Removing the fan from the motherboard

Install the fan module

Steps

1. Place the fan module into the mounting position in the node.
2. Squeeze the blue tabs and press downward to lock the fan module into position.
3. Connect the fan module power cable to the connector on the motherboard.

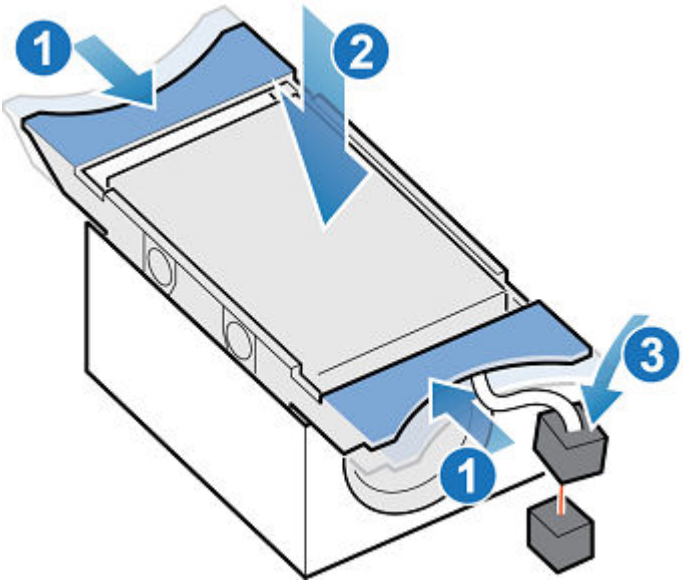


Figure 105. Installing the fan module

Install the top cover on the node

Steps

1. Position the top cover over the node and align it with the slots on the sides at the rear of the node.

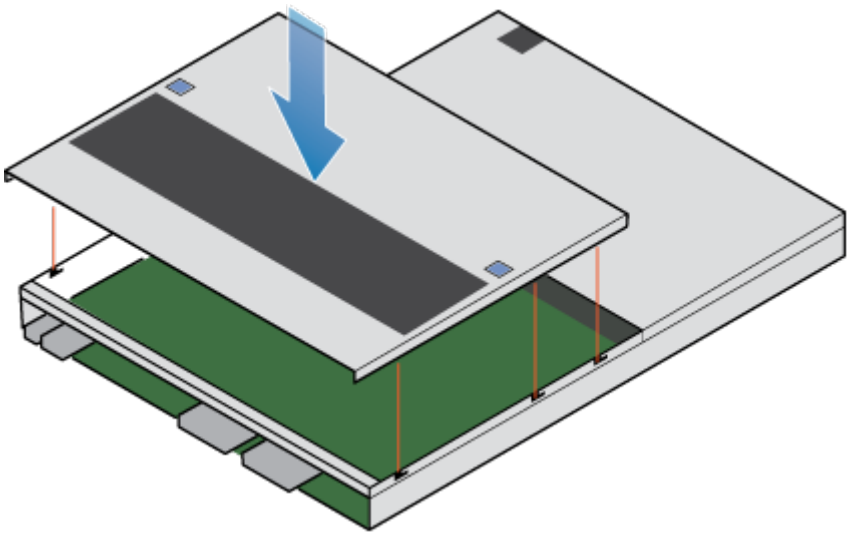


Figure 106. Aligning the top cover

2. Pull the top cover forward to secure it in place.

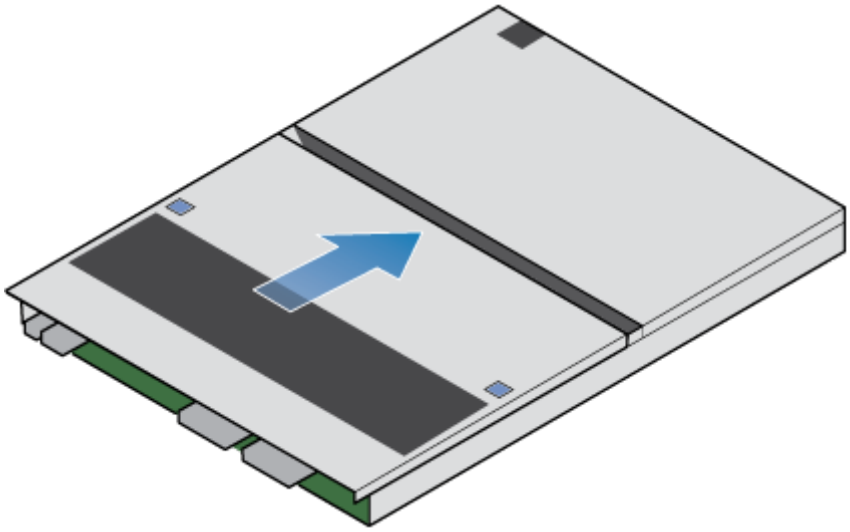


Figure 107. Securing the top cover

Install the node

Steps

1. Align the pins on the top of the node with the grooves on the top of the chassis.
2. Slide the node into the chassis until it stops, about halfway in.

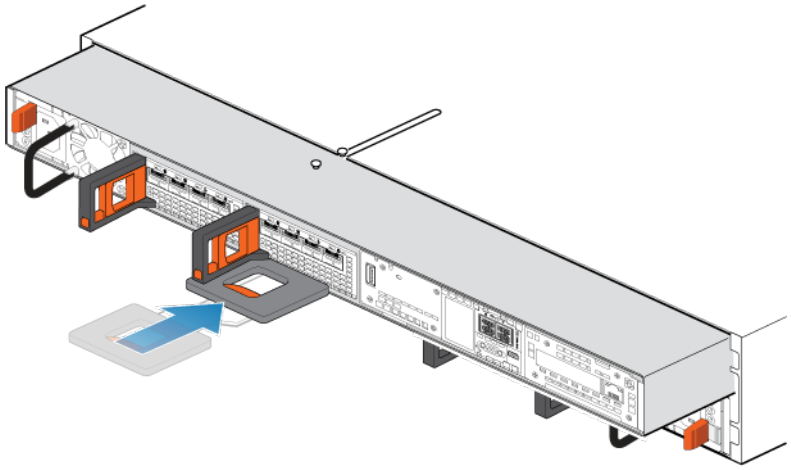


Figure 108. Sliding the node halfway into the chassis

3. Pull the black release tab out completely, and slide the rest of the node back into the chassis.
   The black release tab slides back into the system as it is inserted.

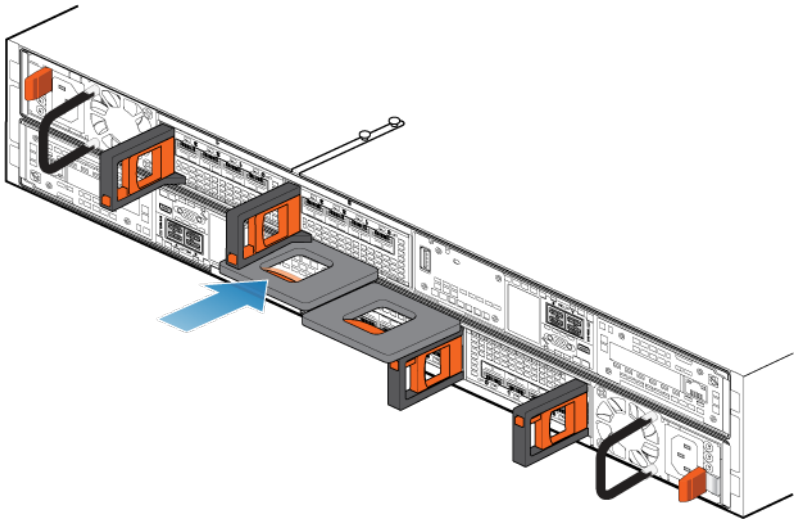


Figure 109. Installing the node

4. Reconnect the back-end cables and the cables to the I/O modules and network ports.
5. Pull the orange release trigger and push in gently to re-engage the locking mechanism.
   If the black release tab comes out when pulled, the locking mechanism is not engaged.
6. If the node came with a node ID plug, push the node ID plug onto the node handle.
7. Plug in the power cable.

Verify the operation of a replacement fan module

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the fan module.
3. On the **Components** card, under **Internal View**, expand the node that includes the fan module, and then select the relevant **FanModule**.
   The status of the replacement fan module should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the fan module is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a dual inline memory module (DIMM)

Take the following actions to remove the faulted DIMM and install the replacement DIMM into the system.

The DIMMs are located within the node. You can access the DIMMs by removing the node from the chassis and opening the top cover.

NOTE: The DIMMs must stay in their original position. Do not move any DIMMs to a different slot.

Before you begin

CAUTION: Before starting this procedure, use the PowerStore Manager Hardware view and Alerts view to verify that the appliance and peer node are healthy with no outstanding alerts. If multiple nodes need to be removed while performing this procedure, repeat this verification for each affected node before proceeding to remove the next node. If necessary, contact your service provider before starting the replacement procedure.

Identify a faulted DIMM from PowerStore Manager

Before you replace a DIMM, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted DIMM.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the DIMM that you need to replace.
3. On the **Components** card, under **Internal View**, expand the node that includes the DIMM, and then select the relevant **DIMM**.

   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Power down the node

Power down the node as described in Power control procedures.

Remove the node

This procedure describes how to remove a node from the chassis. There are two nodes. The top node is considered to be upside-down and mirrors the bottom node. The procedure for removing the top node and the bottom node is the same.

Prerequisites

If the I/O modules and network cables are not already labeled, label them clearly for reconnecting later.

About this task

WARNING: Do not remove the node within five minutes of system power off to ensure that the system has had time to complete caching.

CAUTION: Do not remove a node while the "Unsafe to remove" LED is lit. If the LED is lit, the peer node has been powered off or is offline and this node should not be removed.

CAUTION: Because nodes include cooling fans, they should be removed for as short a time as possible. Do not remove nodes from a live system unless replacement parts are available.

Steps

1. Rotate the power cable retention bail to the left (right for top power supply). Disconnect the power cable from the power supply.

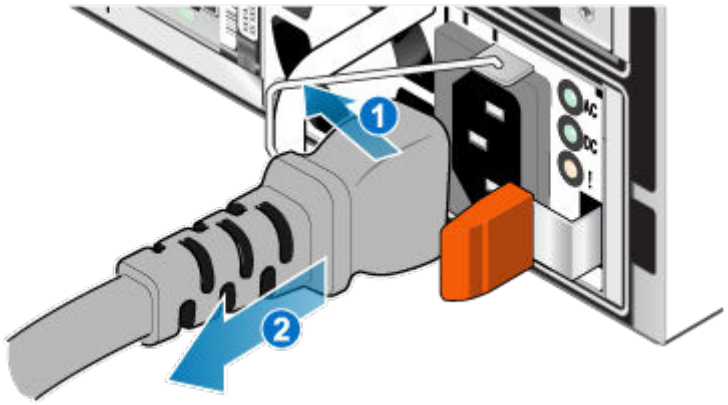


Figure 110. Removing the power cable

2. Disconnect the network and all other cables from the back of the I/O modules and network ports on the node.

   NOTE: Label the cables before you remove them.

   NOTE: Do not remove any cables from the other node.

3. If the node has a node ID plug on the node handle, remove the node ID plug.
4. Pull the orange release trigger while gently pushing in on the node.

   The hook disengages from the locking mechanism, and the release tab slides out.

   NOTE: The node comes completely out of the chassis. Be prepared to support the node to avoid dropping it.

   NOTE: The release trigger and handle for node B is on the upper left. The release trigger and handle for node A is on the bottom right.

   CAUTION: Removing the incorrect node leads to loss of system power and cached data will be lost.

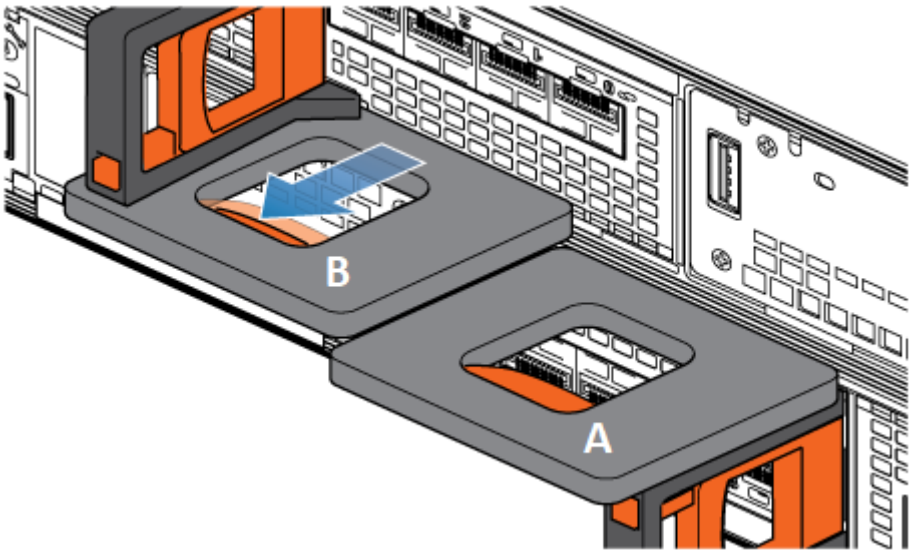


Figure 111. Disengaging the locking mechanism for node B

5. Before removing the node, ensure that the wire bail is properly secured to the power supply cable of the other node to prevent accidental loss of power and cache.
6. Use the release handle to pull the node outward enough to grasp the sides with both hands. Then, with both hands supporting the node, pull the node fully out of the enclosure.

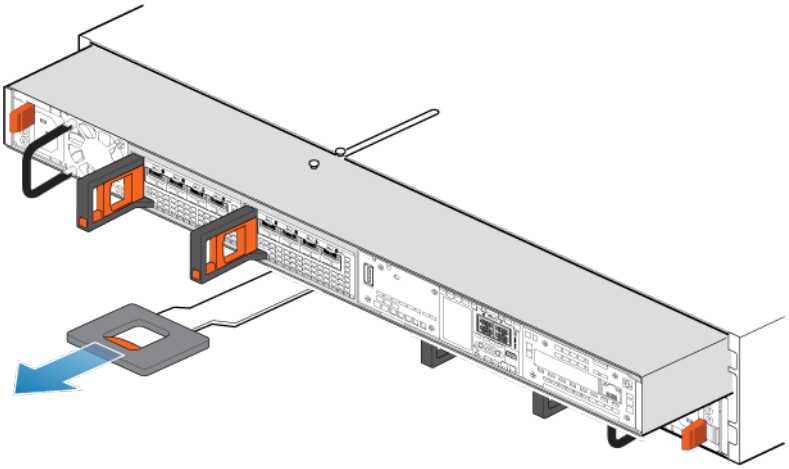


Figure 112. Removing the node

7. Place the node on a clean, flat, static-free work surface.

Remove the top cover from the node

Steps

1. While pushing down the two blue release buttons, slide the top cover towards the rear of the system, until it stops.

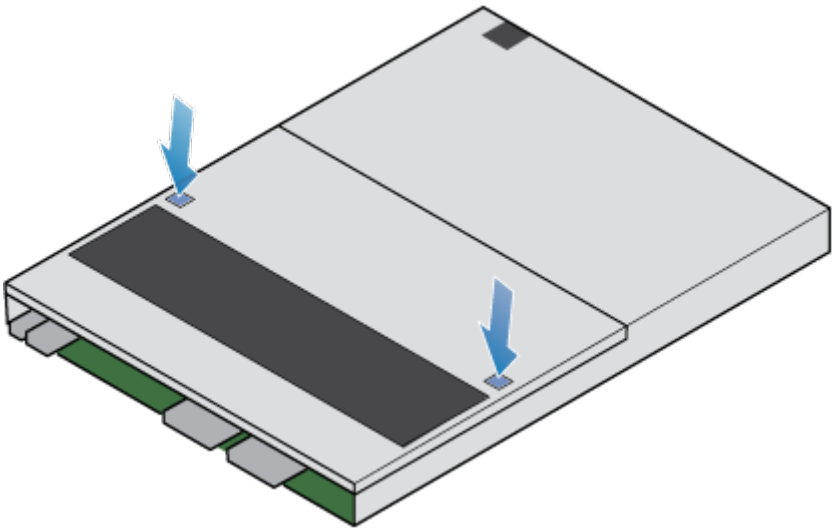


Figure 113. Releasing the top cover

2. Lift the top cover upward, and remove it from the node.

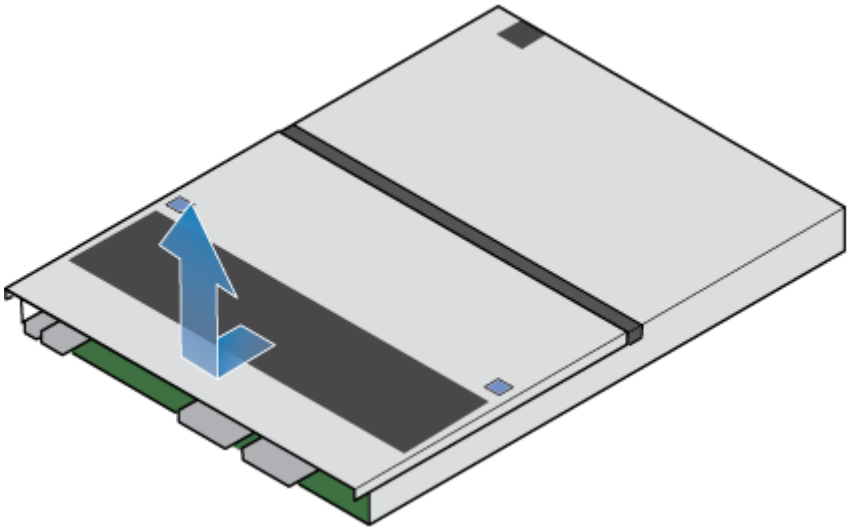


Figure 114. Removing the top cover

Remove the faulted dual inline memory module

Steps

1. Locate the faulted DIMM node by using the following figure as a reference for orientation. The DIMMs are held in place by white or black retaining tabs.

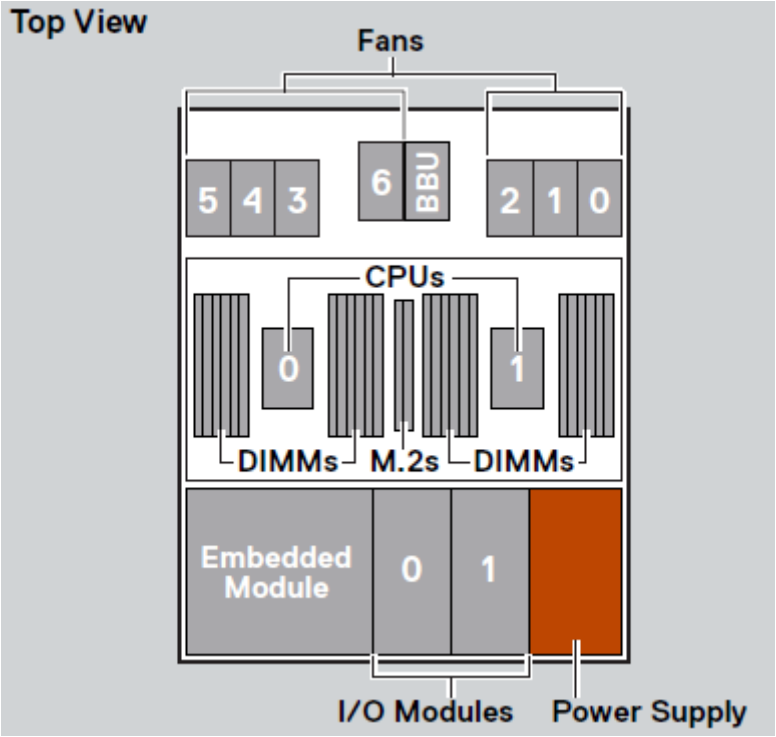


Figure 115. Top view of the node

NOTE: The leftmost DIMM slot is 23, and the slots decrease sequentially to slot 0 on the far right.

2. Press the white or black retaining tabs downward to free the DIMM from its slot.
3. Remove the faulted DIMM.

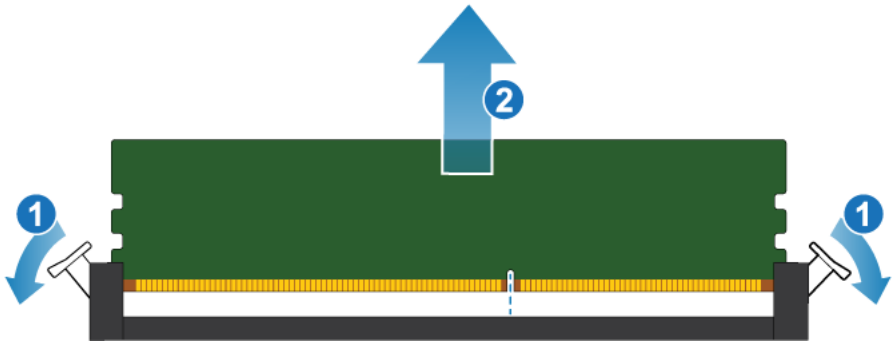


Figure 116. Removing the DIMM

Install the dual inline memory module

Steps

1. Touching only the outside edges of the DIMM, align the DIMM with the connector.
2. Press the DIMM vertically down into the socket using pressure at each end while keeping the leading edge of the DIMM parallel to the connector until it fully seats to the bottom of the socket. When the DIMM engages the contacts in the socket, you will feel resistance, and slightly more force is required to push the module down. During this stage, keep in mind the following precautions:
   - Do not insert the DIMM at an angle.
   - Do not rock the DIMM.
   - Do not insert the DIMM by pushing on one end.

- Do not seat one end of the DIMM and then the other.

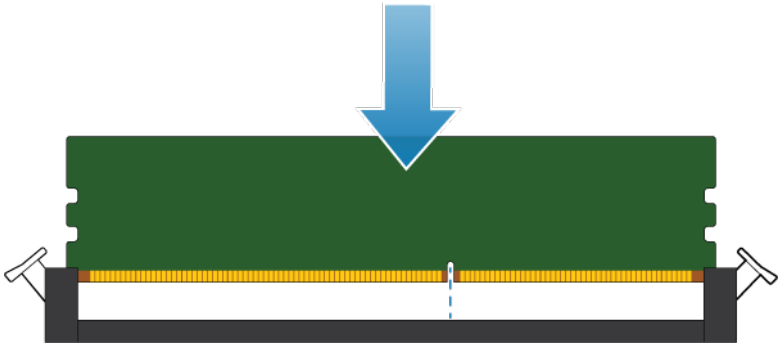


Figure 117. Installing the DIMM

3. Proper DIMM insertion will automatically close the latch ejectors and lock the DIMM into the socket. Verify that the latch ejectors are fully closed and have engaged the notches in the DIMM.

Install the top cover on the node

Steps

1. Position the top cover over the node and align it with the slots on the sides at the rear of the node.

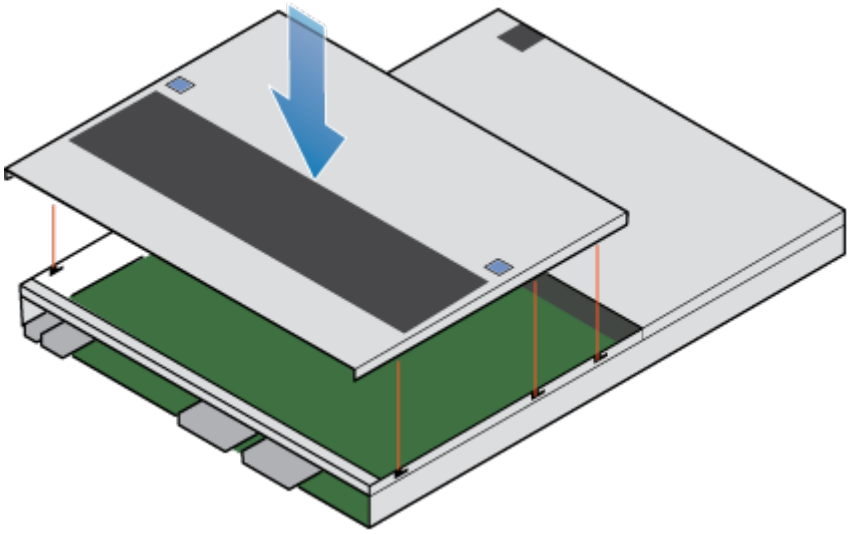


Figure 118. Aligning the top cover

2. Pull the top cover forward to secure it in place.

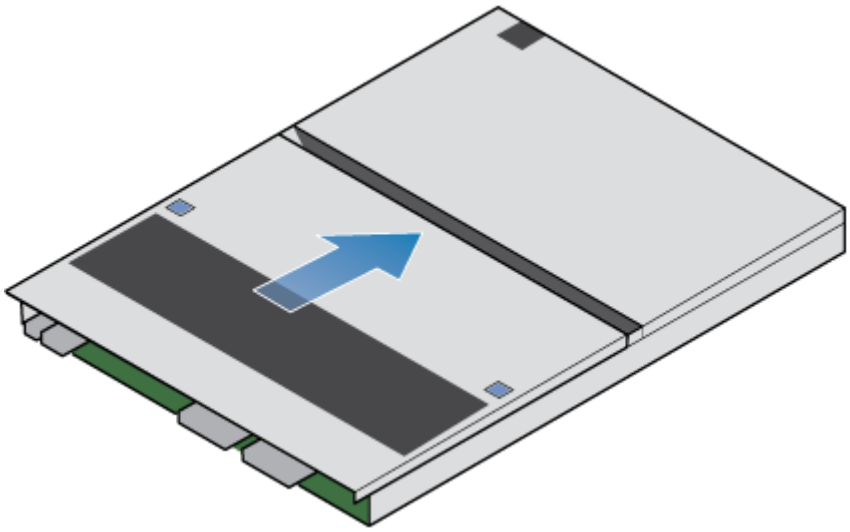


Figure 119. Securing the top cover

Install the node

Steps

1. Align the pins on the top of the node with the grooves on the top of the chassis.
2. Slide the node into the chassis until it stops, about halfway in.

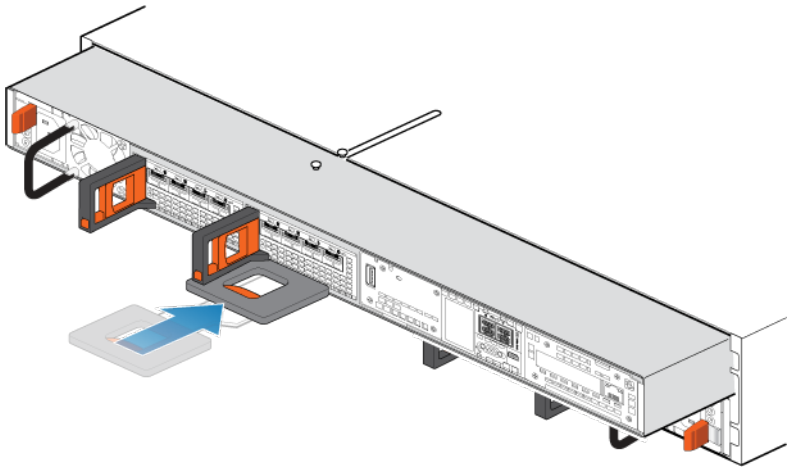


Figure 120. Sliding the node halfway into the chassis

3. Pull the black release tab out completely, and slide the rest of the node back into the chassis.
   The black release tab slides back into the system as it is inserted.

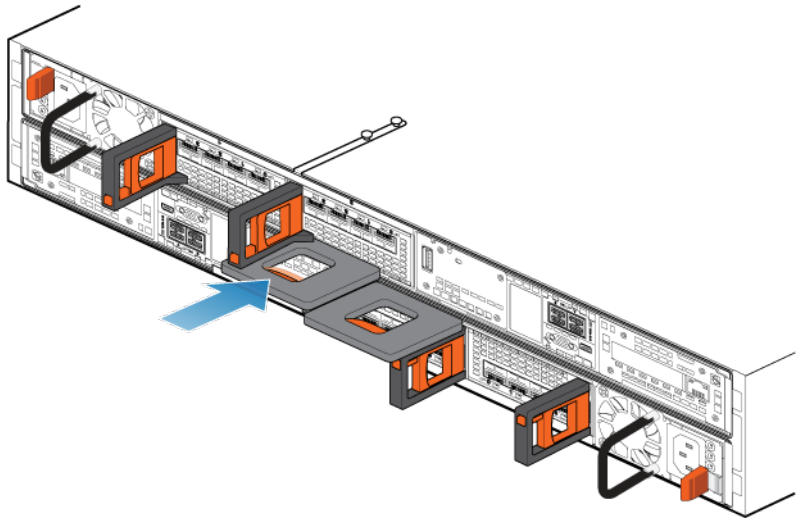


Figure 121. Installing the node

4. Reconnect the back-end cables and the cables to the I/O modules and network ports.
5. Pull the orange release trigger and push in gently to re-engage the locking mechanism.
   If the black release tab comes out when pulled, the locking mechanism is not engaged.
6. If the node came with a node ID plug, push the node ID plug onto the node handle.
7. Plug in the power cable.

Verify the operation of a replacement DIMM

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the DIMM.
3. On the **Components** card, under **Internal View**, expand the node that includes the DIMM, and then select the relevant **DIMM**.
   The status of the replacement DIMM should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the DIMM is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace an internal M.2 boot module

Take the following actions to remove the faulted internal M.2 boot module and install the replacement internal M.2 boot module into the system.

The internal M.2 boot module are located within the node. You can access the internal M.2 boot module by removing the node from the chassis and opening the top cover.

Before you begin

CAUTION: Before starting this procedure, use the PowerStore Manager Hardware view and Alerts view to verify that the appliance and peer node are healthy with no outstanding alerts. If multiple nodes need to be removed while performing this procedure, repeat this verification for each affected node before proceeding to remove the next node. If necessary, contact your service provider before starting the replacement procedure.

Identify a faulted internal M.2 boot module from PowerStore Manager

Before you replace an internal M.2 boot module, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted part.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the internal M.2 boot module that you need to replace.
3. On the **Components** card, under **Internal View**, expand the node that includes the internal M.2 boot module, and then select the relevant **InternalM.2BootModule**.

   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Power down the node

Power down the node as described in Power control procedures.

Remove the node

This procedure describes how to remove a node from the chassis. There are two nodes. The top node is considered to be upside-down and mirrors the bottom node. The procedure for removing the top node and the bottom node is the same.

Prerequisites

If the I/O modules and network cables are not already labeled, label them clearly for reconnecting later.

About this task

WARNING: Do not remove the node within five minutes of system power off to ensure that the system has had time to complete caching.

CAUTION: Do not remove a node while the "Unsafe to remove" LED is lit. If the LED is lit, the peer node has been powered off or is offline and this node should not be removed.

CAUTION: Because nodes include cooling fans, they should be removed for as short a time as possible. Do not remove nodes from a live system unless replacement parts are available.

Steps

1. Rotate the power cable retention bail to the left (right for top power supply). Disconnect the power cable from the power supply.

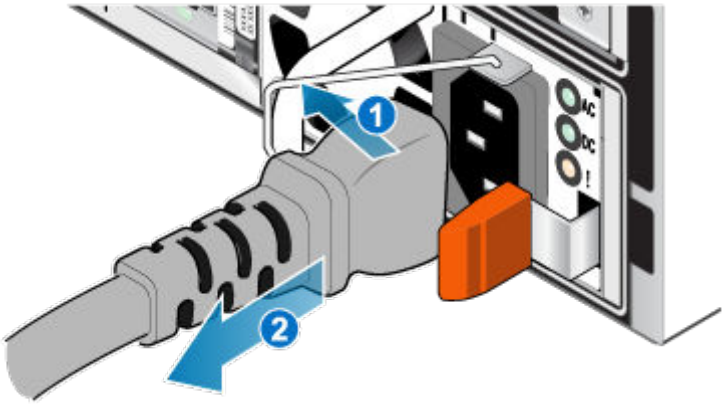


Figure 122. Removing the power cable

2. Disconnect the network and all other cables from the back of the I/O modules and network ports on the node.

   NOTE: Label the cables before you remove them.

   NOTE: Do not remove any cables from the other node.

3. If the node has a node ID plug on the node handle, remove the node ID plug.
4. Pull the orange release trigger while gently pushing in on the node.

   The hook disengages from the locking mechanism, and the release tab slides out.

   NOTE: The node comes completely out of the chassis. Be prepared to support the node to avoid dropping it.

   NOTE: The release trigger and handle for node B is on the upper left. The release trigger and handle for node A is on the bottom right.

   CAUTION: Removing the incorrect node leads to loss of system power and cached data will be lost.

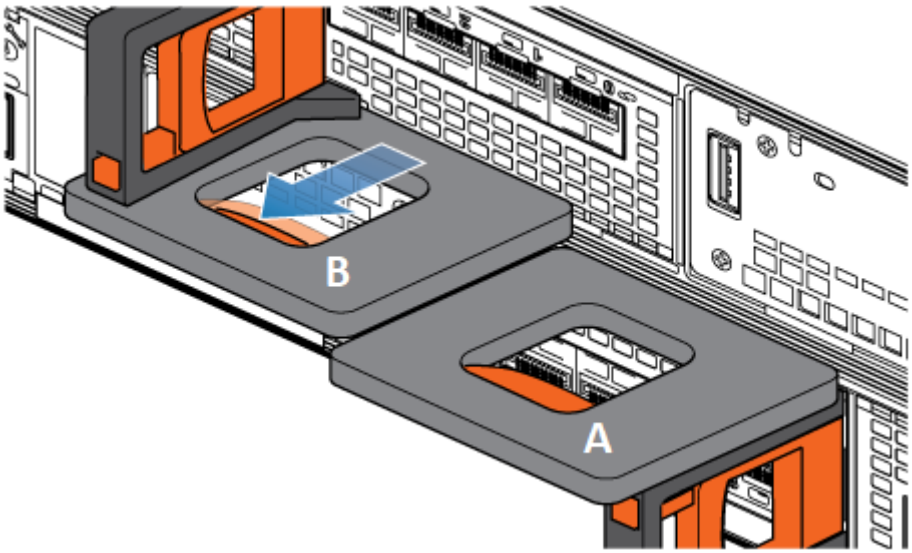


Figure 123. Disengaging the locking mechanism for node B

5. Before removing the node, ensure that the wire bail is properly secured to the power supply cable of the other node to prevent accidental loss of power and cache.

6. Use the release handle to pull the node outward enough to grasp the sides with both hands. Then, with both hands supporting the node, pull the node fully out of the enclosure.

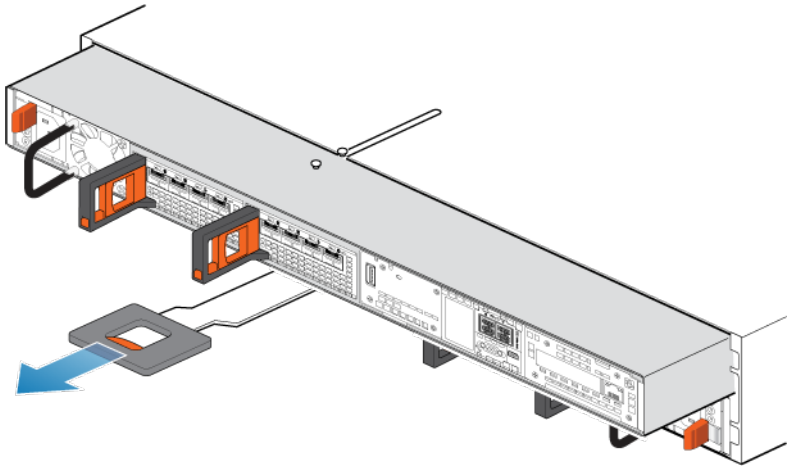


Figure 124. Removing the node

7. Place the node on a clean, flat, static-free work surface.

Remove the top cover from the node

Steps

1. While pushing down the two blue release buttons, slide the top cover towards the rear of the system, until it stops.

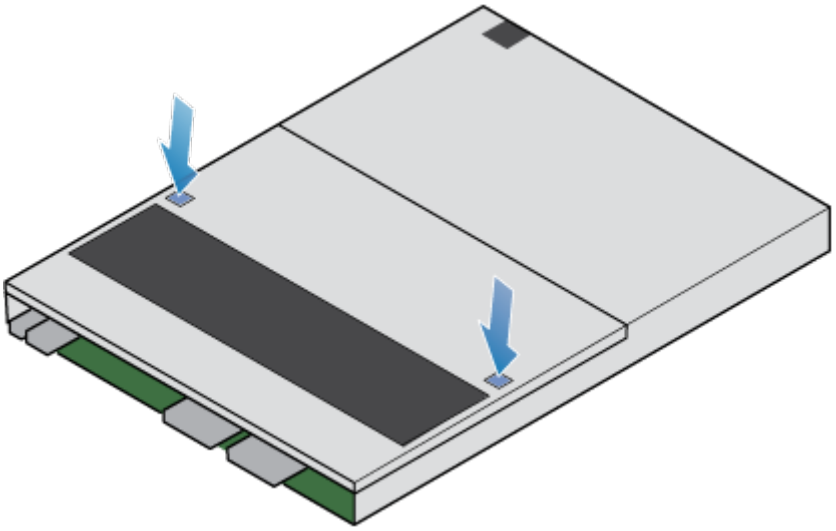


Figure 125. Releasing the top cover

2. Lift the top cover upward, and remove it from the node.

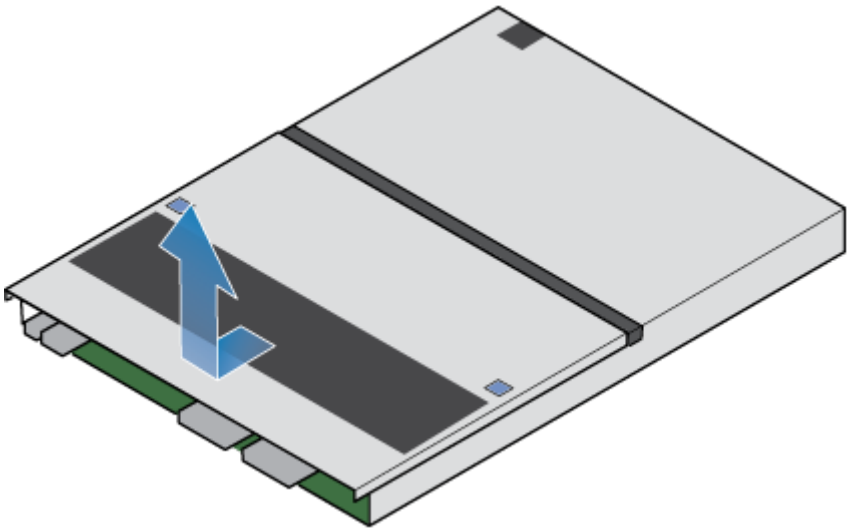


Figure 126. Removing the top cover

Remove the faulted internal M.2 boot module

Steps

1. Locate the M.2 boot module adaptor in the node.
   You can identify the M.2 boot module adaptor by the blue retaining tabs.
2. Press the blue retaining tabs downward to free the M.2 boot module adaptor from its slot.
3. Touching only the outside edges of the M.2 boot module adaptor, remove the M.2 boot module adaptor.

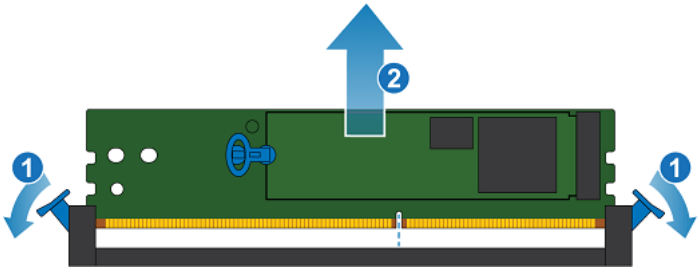


Figure 127. Removing the M.2 boot module adaptor

4. Identify the faulted internal M.2 boot module. One internal M.2 boot module is labeled DRIVE 0 and the other is labeled DRIVE 1. In PowerStore Manager, DRIVE 0 is identified as InternalM.2BootModule0 and DRIVE 1 is identified as InternalM.2BootModule1.
5. On the faulted internal M.2 boot module, gently pull the handle on the release tab to separate it from the tab holding it in place.
6. Gently pull straight up on the pull tab to free it from the M.2 boot module adaptor.
7. Remove the internal M.2 boot module from the M.2 boot module adaptor.

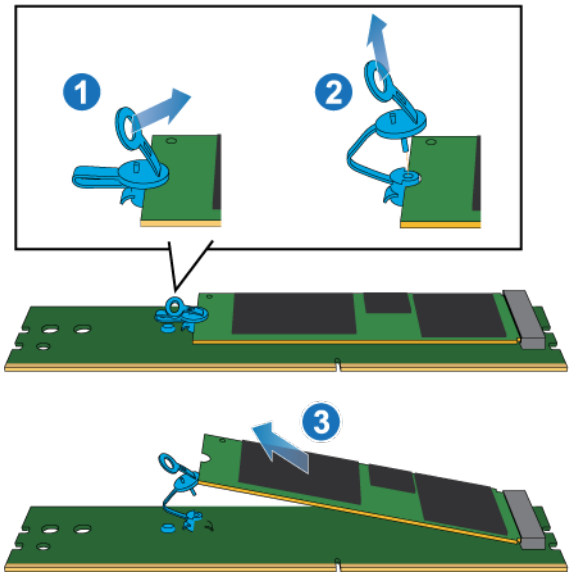


Figure 128. Removing the internal M.2 boot module from the M.2 boot module adaptor

Install the internal M.2 boot module

Steps

1. Place the internal M.2 boot module into the M.2 boot module adaptor.

   NOTE: The side of the internal M.2 boot module with the barcodes should be facing up.

2. Align the blue tab on the replacement internal M.2 boot module with the slot on the M.2 boot module adaptor and gently push it into place.
3. Connect the pull tab to the blue adapter.

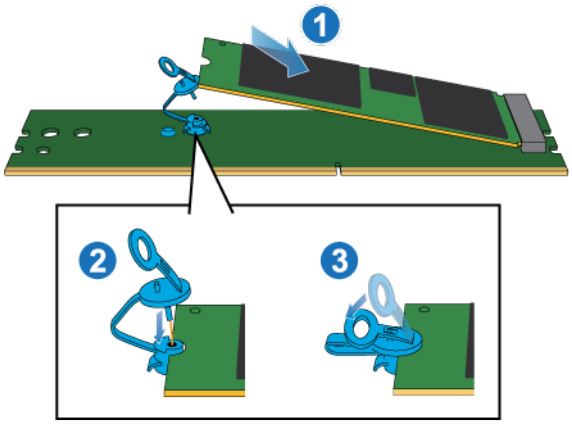


Figure 129. Installing the internal M.2 boot module into the M.2 boot module adaptor

4. Touching only the outside edges of the M.2 boot module adaptor, align the M.2 boot module adaptor with the connector.
5. Firmly push the M.2 boot module adaptor straight down into the connector.

   When the M.2 boot module adaptor is fully seated, you will hear a snap, and feel the connector latches click into place.

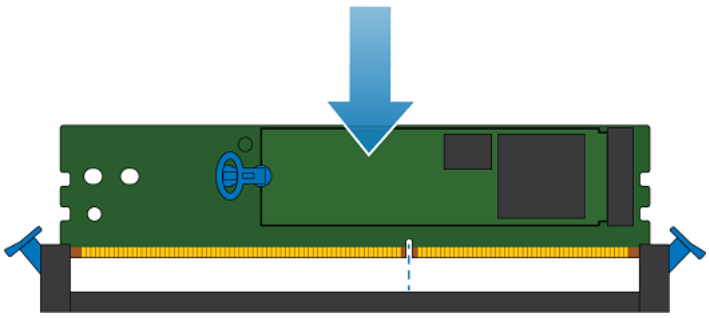


Figure 130. Installing the M.2 boot module adaptor

Install the top cover on the node

Steps

1. Position the top cover over the node and align it with the slots on the sides at the rear of the node.

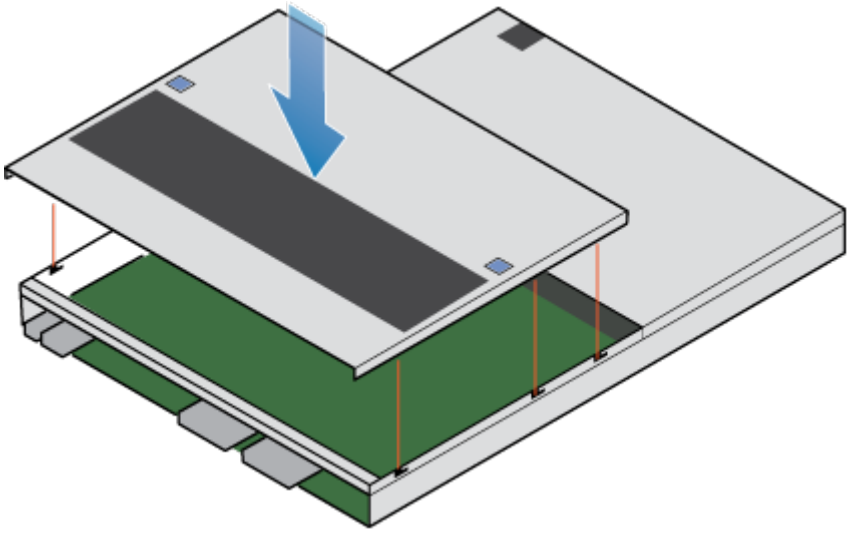


Figure 131. Aligning the top cover

2. Pull the top cover forward to secure it in place.

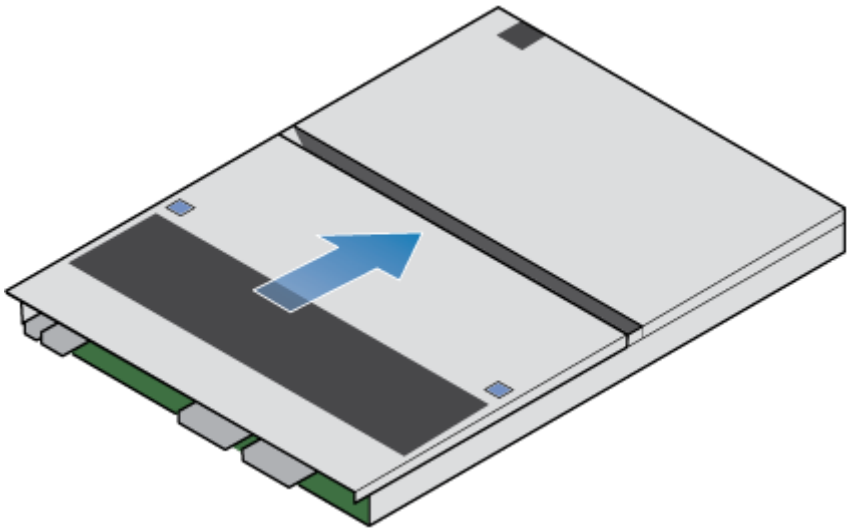


Figure 132. Securing the top cover

Install the node

Steps

1. Align the pins on the top of the node with the grooves on the top of the chassis.
2. Slide the node into the chassis until it stops, about halfway in.

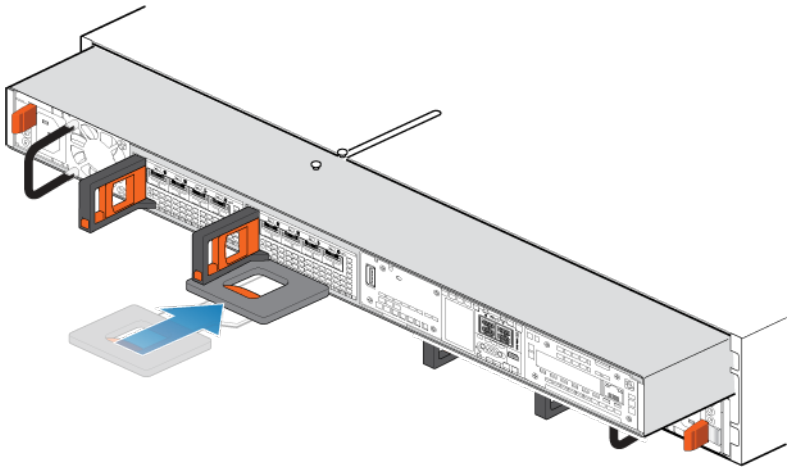


Figure 133. Sliding the node halfway into the chassis

3. Pull the black release tab out completely, and slide the rest of the node back into the chassis.
   The black release tab slides back into the system as it is inserted.

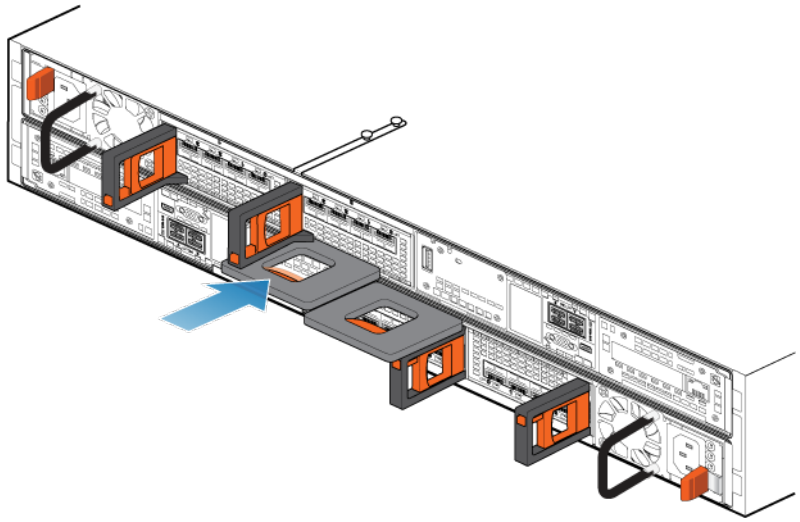


Figure 134. Installing the node

4. Reconnect the back-end cables and the cables to the I/O modules and network ports.
5. Pull the orange release trigger and push in gently to re-engage the locking mechanism.
   If the black release tab comes out when pulled, the locking mechanism is not engaged.
6. If the node came with a node ID plug, push the node ID plug onto the node handle.
7. Plug in the power cable.

Verify the operation of a replacement internal M.2 boot module

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the internal M.2 boot module.
3. On the **Components** card, under **Internal View**, expand the node that includes the internal M.2 boot module, and then select the relevant **InternalM.2BootModule**.
   The status of the replacement internal M.2 boot module should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the internal M.2 boot module is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace an M.2 boot module adaptor

Take the following actions to remove the faulted M.2 boot module adaptor and install the replacement M.2 boot module adaptor into the system.

The M.2 boot module adaptor is located within the node. You can access the M.2 boot module adaptor by removing the node from the chassis and opening the top cover.

Before you begin

CAUTION: Before starting this procedure, use the PowerStore Manager Hardware view and Alerts view to verify that the appliance and peer node are healthy with no outstanding alerts. If multiple nodes need to be removed while performing this procedure, repeat this verification for each affected node before proceeding to remove the next node. If necessary, contact your service provider before starting the replacement procedure.

Identify a faulted M.2 boot module adaptor from PowerStore Manager

Before you replace an M.2 boot module adaptor, ensure that you have identified its location within the system. The M.2 boot module adaptor is not visible in PowerStore Manager, but you can identify and locate the associated internal M.2 boot module.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the M.2 boot module adaptor that you need to replace.
3. On the **Components** card, under **Internal View**, expand the node that includes the M.2 boot module adaptor, and then select the relevant **InternalM.2BootModule**.

   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Power down the node

Power down the node as described in Power control procedures.

Remove the node

This procedure describes how to remove a node from the chassis. There are two nodes. The top node is considered to be upside-down and mirrors the bottom node. The procedure for removing the top node and the bottom node is the same.

Prerequisites

If the I/O modules and network cables are not already labeled, label them clearly for reconnecting later.

About this task

WARNING: Do not remove the node within five minutes of system power off to ensure that the system has had time to complete caching.

CAUTION: Do not remove a node while the "Unsafe to remove" LED is lit. If the LED is lit, the peer node has been powered off or is offline and this node should not be removed.

CAUTION: Because nodes include cooling fans, they should be removed for as short a time as possible. Do not remove nodes from a live system unless replacement parts are available.

Steps

1. Rotate the power cable retention bail to the left (right for top power supply). Disconnect the power cable from the power supply.

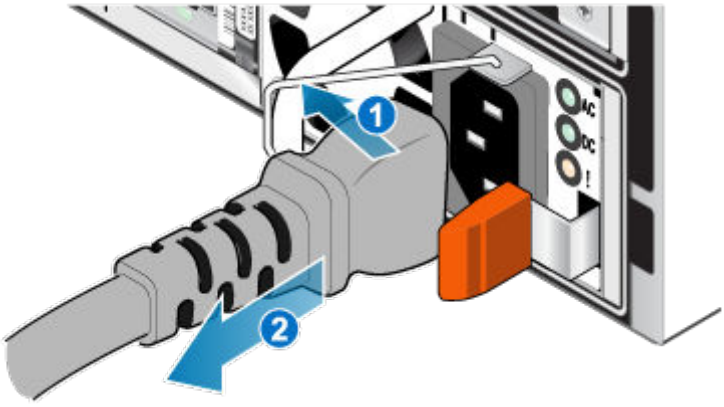


Figure 135. Removing the power cable

2. Disconnect the network and all other cables from the back of the I/O modules and network ports on the node.

   NOTE: Label the cables before you remove them.

   NOTE: Do not remove any cables from the other node.

3. If the node has a node ID plug on the node handle, remove the node ID plug.
4. Pull the orange release trigger while gently pushing in on the node.

   The hook disengages from the locking mechanism, and the release tab slides out.

   NOTE: The node comes completely out of the chassis. Be prepared to support the node to avoid dropping it.

   NOTE: The release trigger and handle for node B is on the upper left. The release trigger and handle for node A is on the bottom right.

   CAUTION: Removing the incorrect node leads to loss of system power and cached data will be lost.

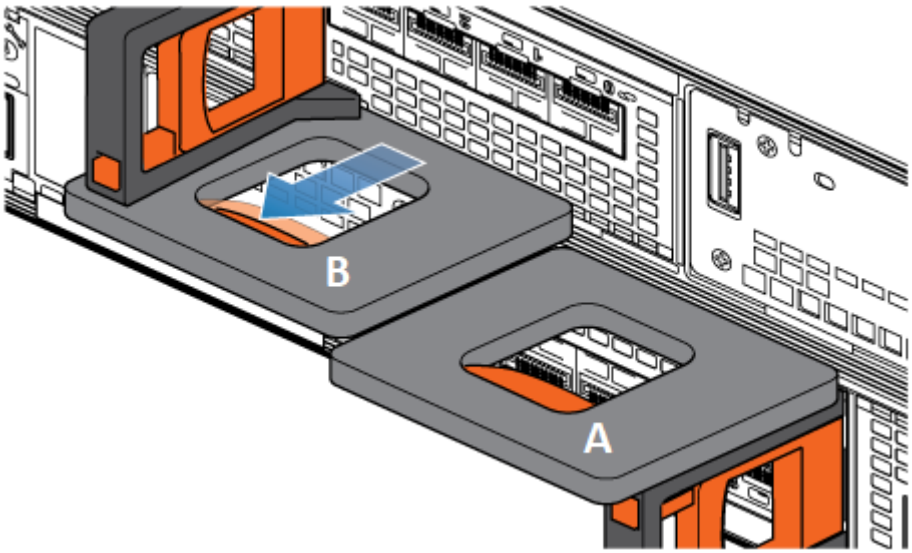


Figure 136. Disengaging the locking mechanism for node B

5. Before removing the node, ensure that the wire bail is properly secured to the power supply cable of the other node to prevent accidental loss of power and cache.

6. Use the release handle to pull the node outward enough to grasp the sides with both hands. Then, with both hands supporting the node, pull the node fully out of the enclosure.

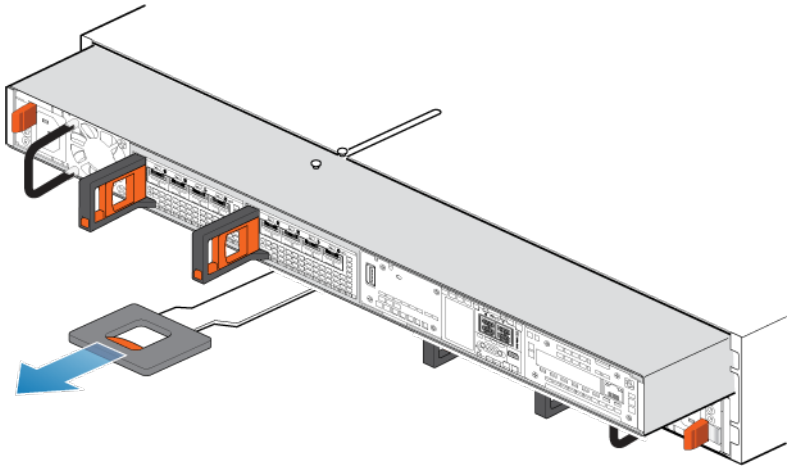


Figure 137. Removing the node

7. Place the node on a clean, flat, static-free work surface.

Remove the top cover from the node

Steps

1. While pushing down the two blue release buttons, slide the top cover towards the rear of the system, until it stops.

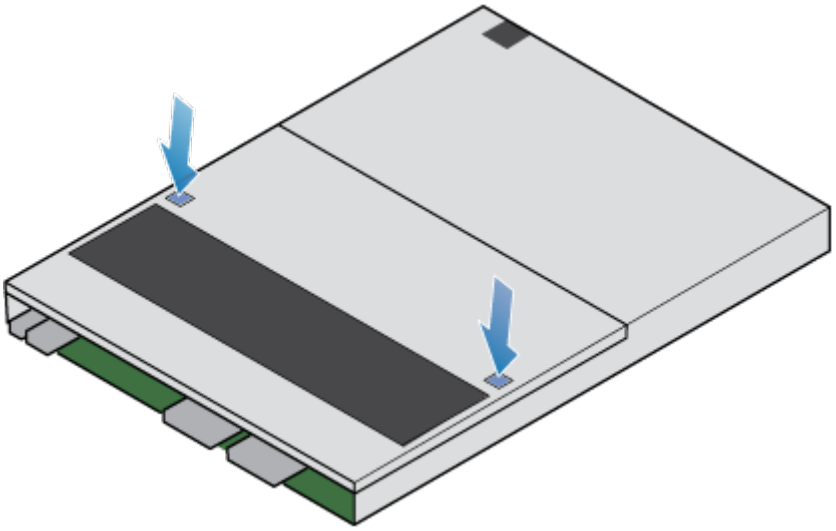


Figure 138. Releasing the top cover

2. Lift the top cover upward, and remove it from the node.

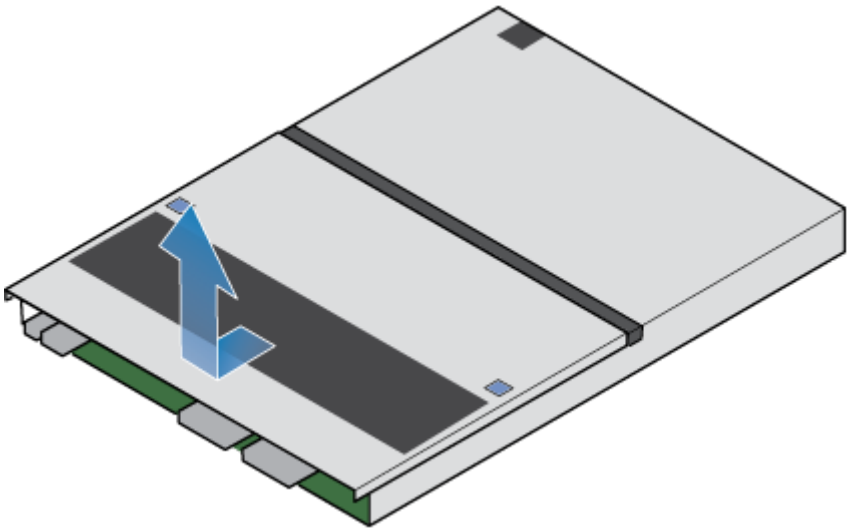


Figure 139. Removing the top cover

Remove the faulted M.2 boot module adaptor

Steps

1. Locate the M.2 boot module adaptor in the node.
   You can identify the M.2 boot module adaptor by the blue retaining tabs.
2. Press the blue retaining tabs downward to free the M.2 boot module adaptor from its slot.
3. Touching only the outside edges of the M.2 boot module adaptor, remove the M.2 boot module adaptor.

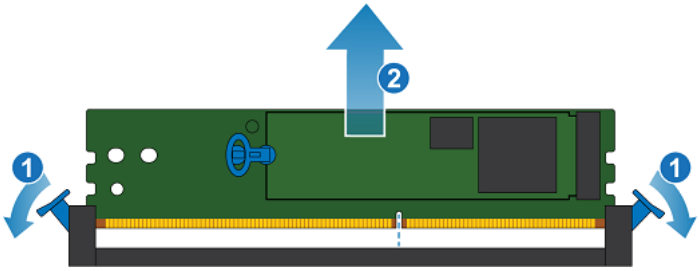


Figure 140. Removing the M.2 boot module adaptor

4. Remove the internal M.2 boot modules:
   a. Gently pull the handle on the release tab to separate it from the tab holding it in place.
   b. Gently pull straight up on the pull tab to free it from the M.2 boot module adaptor.
   c. Remove the internal M.2 boot module from the M.2 boot module adaptor.

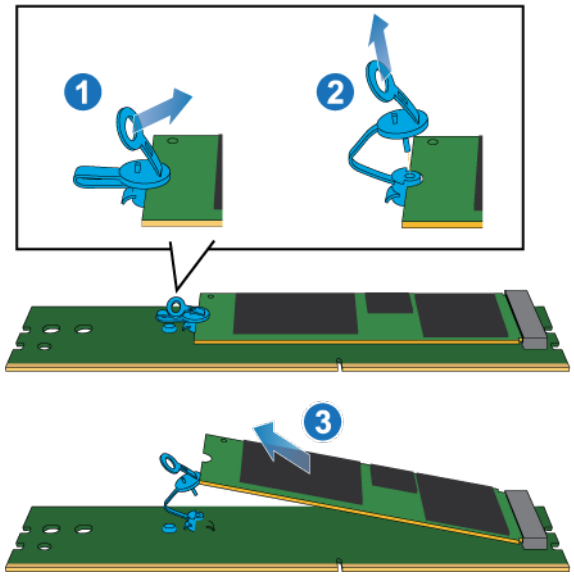


Figure 141. Removing the internal M.2 boot modules from the M.2 boot module adaptor

Install the M.2 boot module adaptor

Steps

1. Place the internal M.2 boot modules that you removed from the faulted M.2 boot module adaptor into the new M.2 boot module adaptor.

   NOTE: The side of the internal M.2 boot module with the barcodes should be facing up.

2. Align the blue tab on the replacement internal M.2 boot module with the slot on the M.2 boot module adaptor and gently push it into place.
3. Connect the pull tab to the blue adapter.

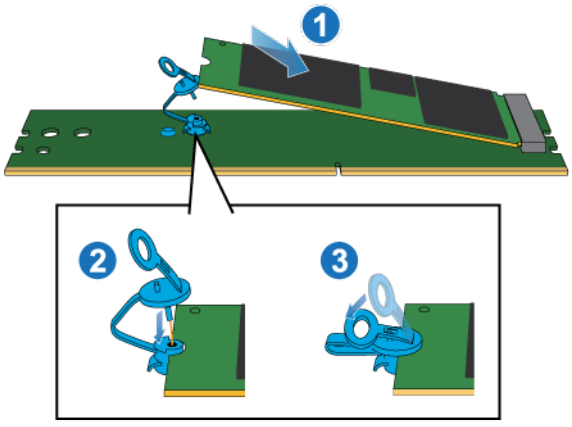


Figure 142. Installing the internal M.2 boot modules into the M.2 boot module adaptor

4. Touching only the outside edges of the M.2 boot module adaptor, align the M.2 boot module adaptor with the connector.
5. Firmly push the M.2 boot module adaptor straight down into the connector.

   When the M.2 boot module adaptor is fully seated, you will hear a snap, and feel the connector latches click into place.

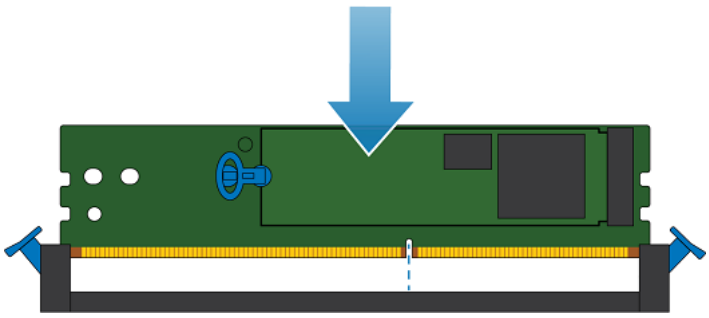


Figure 143. Installing the M.2 boot module adaptor

Install the top cover on the node

Steps

1. Position the top cover over the node and align it with the slots on the sides at the rear of the node.

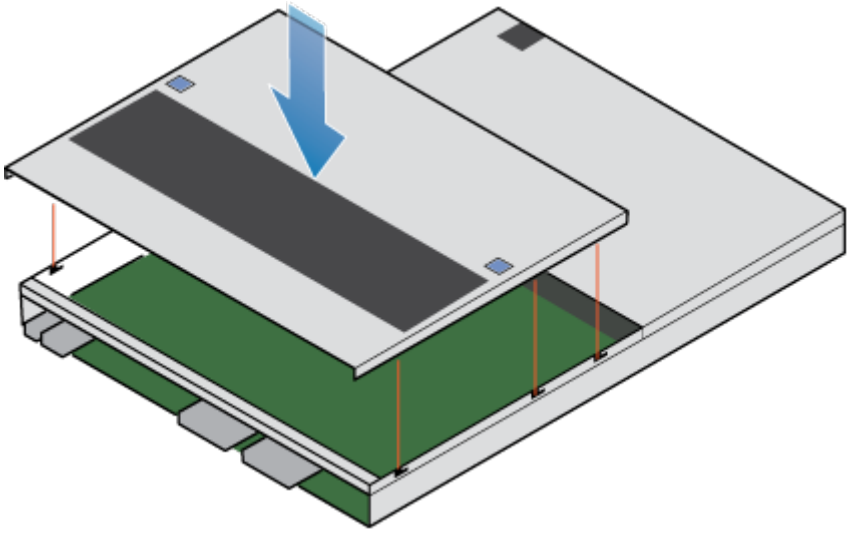


Figure 144. Aligning the top cover

2. Pull the top cover forward to secure it in place.

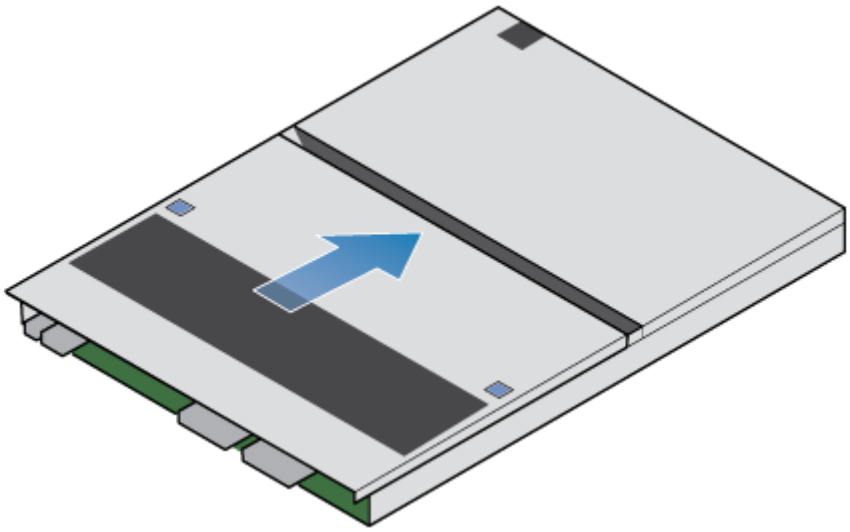


Figure 145. Securing the top cover

Install the node

Steps

1. Align the pins on the top of the node with the grooves on the top of the chassis.
2. Slide the node into the chassis until it stops, about halfway in.

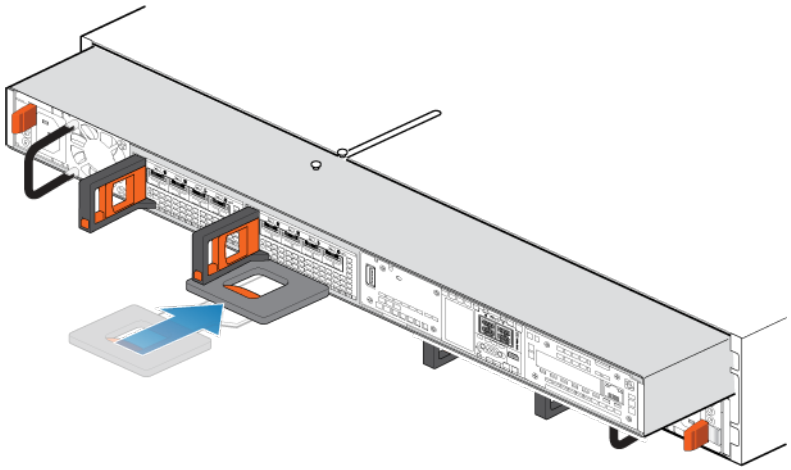


Figure 146. Sliding the node halfway into the chassis

3. Pull the black release tab out completely, and slide the rest of the node back into the chassis.
   The black release tab slides back into the system as it is inserted.

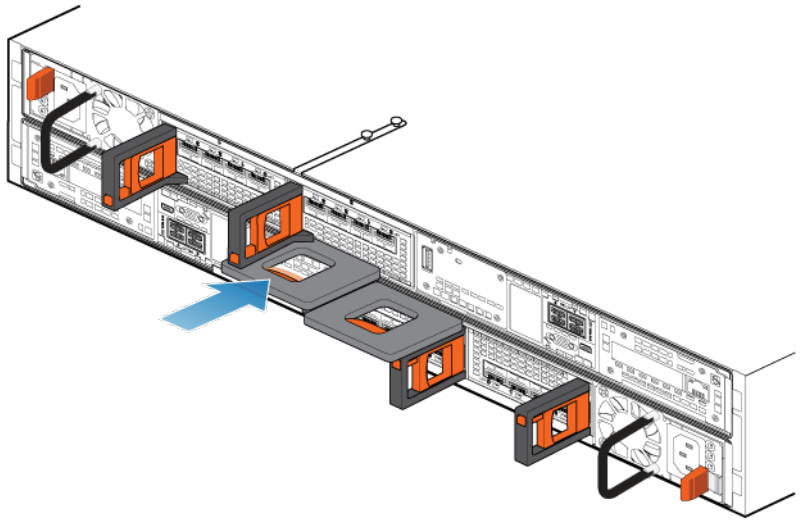


Figure 147. Installing the node

4. Reconnect the back-end cables and the cables to the I/O modules and network ports.
5. Pull the orange release trigger and push in gently to re-engage the locking mechanism.
   If the black release tab comes out when pulled, the locking mechanism is not engaged.
6. If the node came with a node ID plug, push the node ID plug onto the node handle.
7. Plug in the power cable.

Verify the operation of a replacement M.2 boot module adaptor

About this task

The M.2 boot module adaptor is not visible in PowerStore Manager, but you can view the associated internal M.2 boot module.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the M.2 boot module adaptor.
3. On the **Components** card, under **Internal View**, expand the node that includes the internal M.2 boot module, and then select the relevant **InternalM.2BootModule**.
   The status of the replacement internal M.2 boot module should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the M.2 boot module adaptor is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.

d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a node

Take the following actions to remove the faulted node from the enclosure and install the replacement node.

Before you begin

CAUTION: Before starting this procedure, use the PowerStore Manager Hardware view and Alerts view to verify that the appliance and peer node are healthy with no outstanding alerts. If multiple nodes need to be removed while performing this procedure, repeat this verification for each affected node before proceeding to remove the next node. If necessary, contact your service provider before starting the replacement procedure.

Identify a faulted node from PowerStore Manager

Before you replace a node, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted node.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the node that you need to replace.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.
4. Select the relevant **Node**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Power down the node

Power down the node as described in Power control procedures.

Remove the node

This procedure describes how to remove a node from the chassis. There are two nodes. The top node is considered to be upside-down and mirrors the bottom node. The procedure for removing the top node and the bottom node is the same.

Prerequisites

If the I/O modules and network cables are not already labeled, label them clearly for reconnecting later.

About this task

WARNING: Do not remove the node within five minutes of system power off to ensure that the system has had time to complete caching.

CAUTION: Do not remove a node while the "Unsafe to remove" LED is lit. If the LED is lit, the peer node has been powered off or is offline and this node should not be removed.

CAUTION: Because nodes include cooling fans, they should be removed for as short a time as possible. Do not remove nodes from a live system unless replacement parts are available.

Steps

1. Rotate the power cable retention bail to the left (right for top power supply). Disconnect the power cable from the power supply.

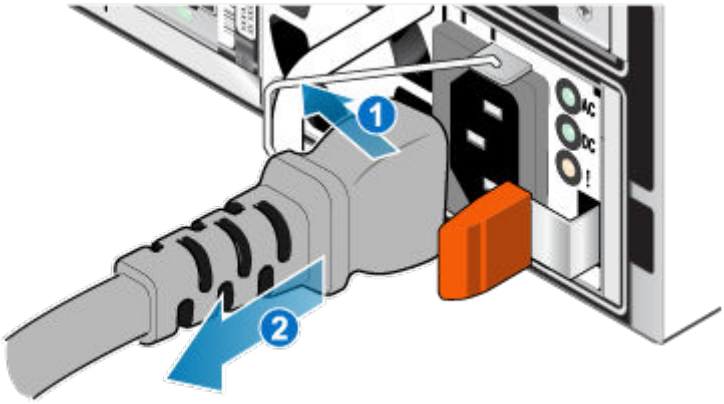


Figure 148. Removing the power cable

2. Disconnect the network and all other cables from the back of the I/O modules and network ports on the node.

   NOTE: Label the cables before you remove them.

   NOTE: Do not remove any cables from the other node.

3. If the node has a node ID plug on the node handle, remove the node ID plug.
4. Pull the orange release trigger while gently pushing in on the node.

   The hook disengages from the locking mechanism, and the release tab slides out.

   NOTE: The node comes completely out of the chassis. Be prepared to support the node to avoid dropping it.

   NOTE: The release trigger and handle for node B is on the upper left. The release trigger and handle for node A is on the bottom right.

   CAUTION: Removing the incorrect node leads to loss of system power and cached data will be lost.

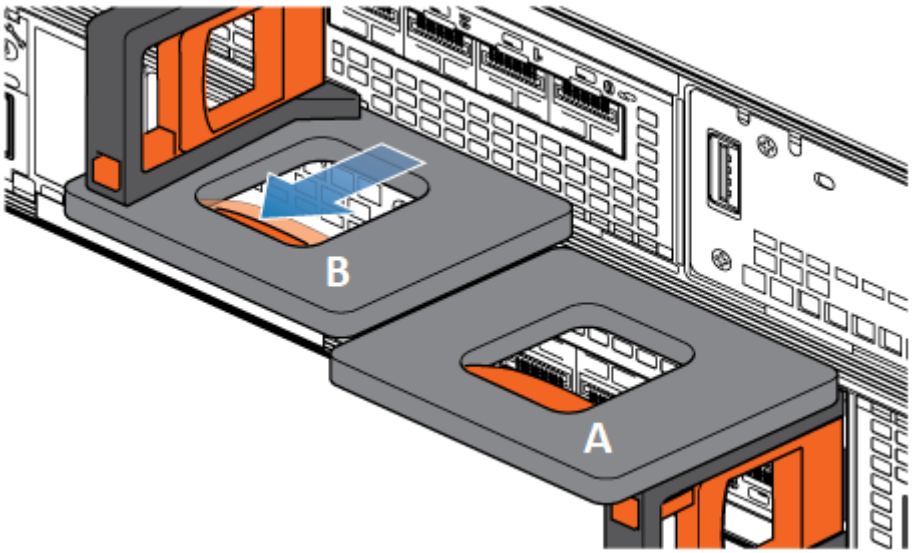


Figure 149. Disengaging the locking mechanism for node B

5. Before removing the node, ensure that the wire bail is properly secured to the power supply cable of the other node to prevent accidental loss of power and cache.
6. Use the release handle to pull the node outward enough to grasp the sides with both hands. Then, with both hands supporting the node, pull the node fully out of the enclosure.

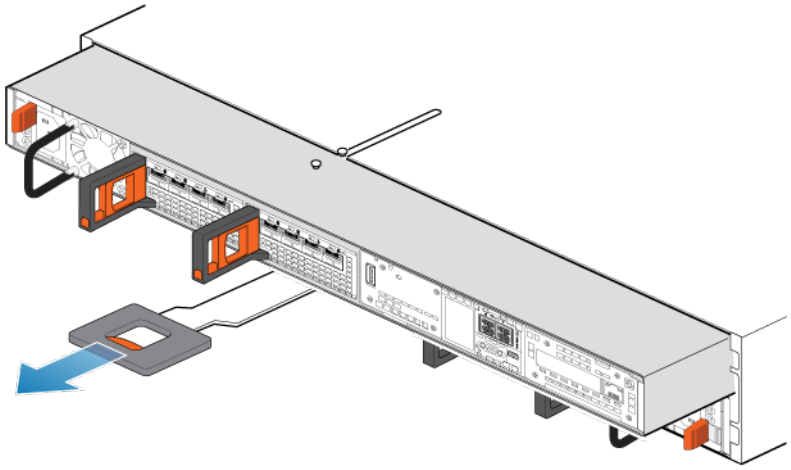


Figure 150. Removing the node

7. Place the node on a clean, flat, static-free work surface.

Remove the top cover from the node

Steps

1. While pushing down the two blue release buttons, slide the top cover towards the rear of the system, until it stops.

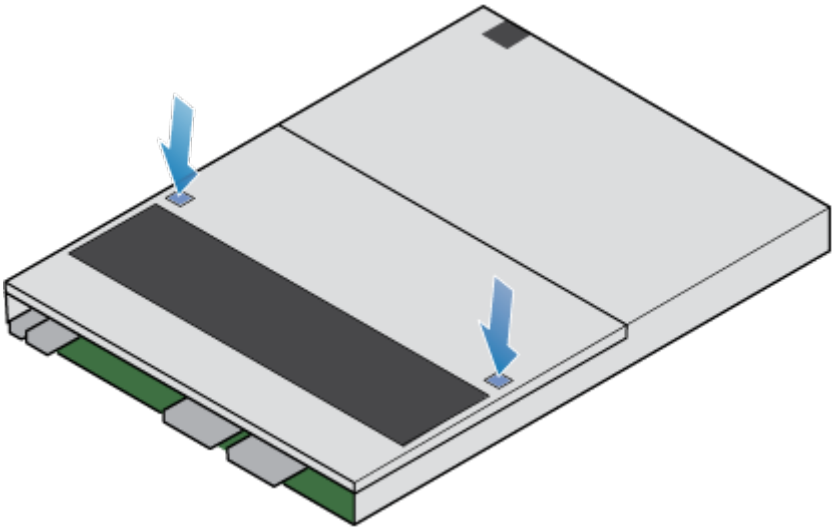


Figure 151. Releasing the top cover

2. Lift the top cover upward, and remove it from the node.

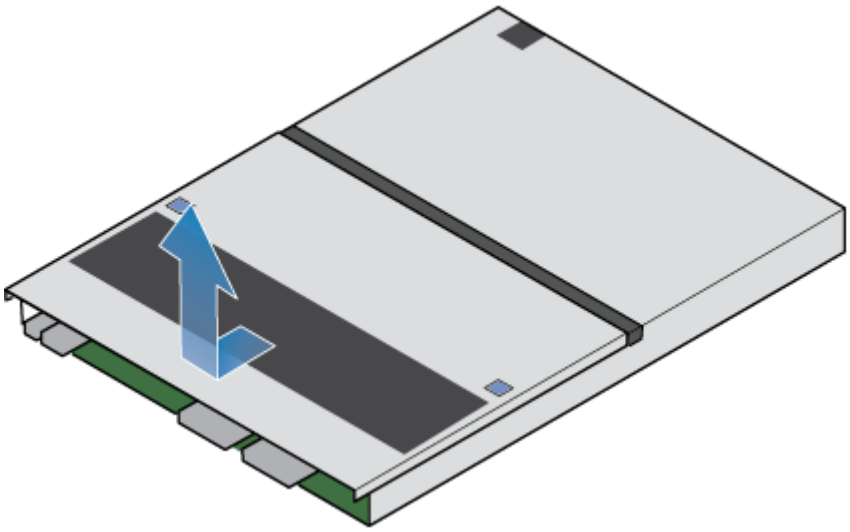


Figure 152. Removing the top cover

Transfer parts from the faulted node to the replacement node

Transfer the following components from the faulted node to the corresponding locations in the replacement node.

To help ensure the correct placement in the enclosure, transfer only one component at a time.

NOTE: Confirm that all parts are fully seated before inserting the node into the base enclosure.

NOTE: Do not add any components while the node is powering on.

- Transfer the power supply.
- Transfer the I/O modules and fillers.
- Transfer the embedded module without removing the 4-port card.
- Transfer the internal M.2 boot modules without removing them from the adapters.
- Transfer DIMMs.

  NOTE: Move DIMMs one at a time from the faulted node to the same slot on the replacement node.

- Transfer internal fans.

  NOTE: The replacement node may or may not have fans installed when you receive it. If it does have fans, ignore the steps for transferring the fan modules from the faulted node to the replacement node. If it does not have fans, complete the steps to remove the fan modules from the faulted node and install them in the replacement node.

- Transfer the internal battery backup module.

Install the top cover on the node

Steps

1. Position the top cover over the node and align it with the slots on the sides at the rear of the node.

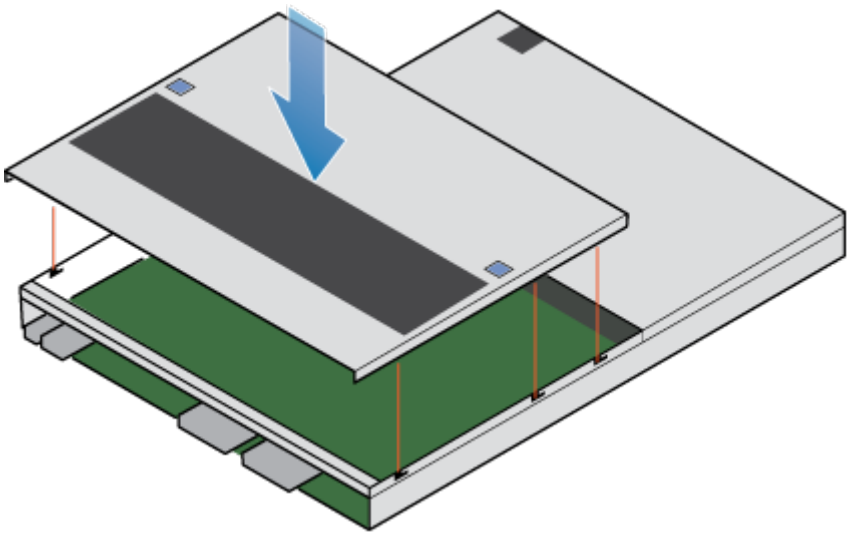


Figure 153. Aligning the top cover

2. Pull the top cover forward to secure it in place.

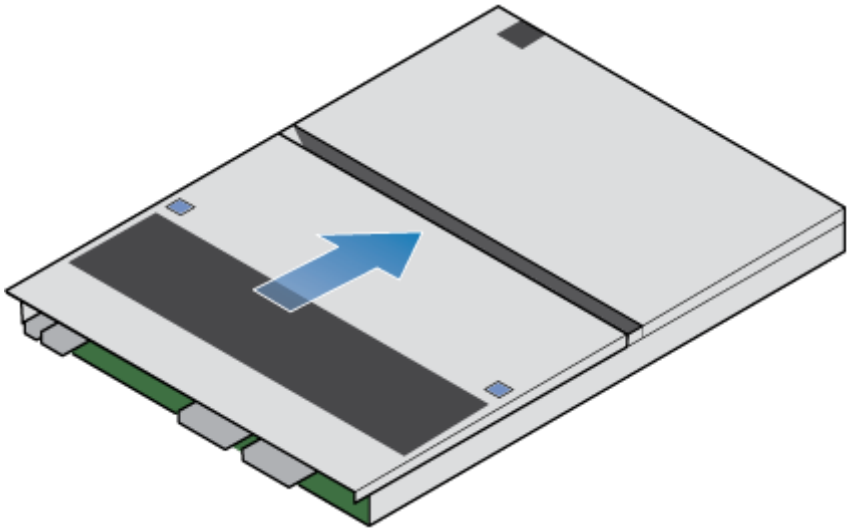


Figure 154. Securing the top cover

Install the node

Steps

1. Align the pins on the top of the node with the grooves on the top of the chassis.
2. Slide the node into the chassis until it stops, about halfway in.

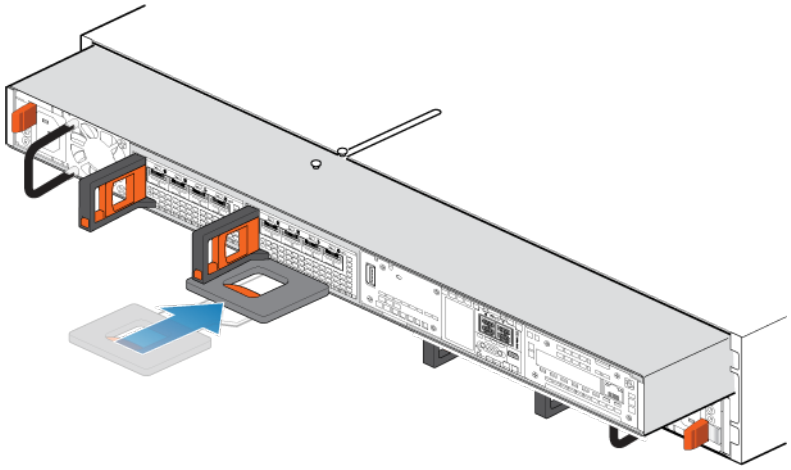


Figure 155. Sliding the node halfway into the chassis

3. Pull the black release tab out completely, and slide the rest of the node back into the chassis.
   The black release tab slides back into the system as it is inserted.

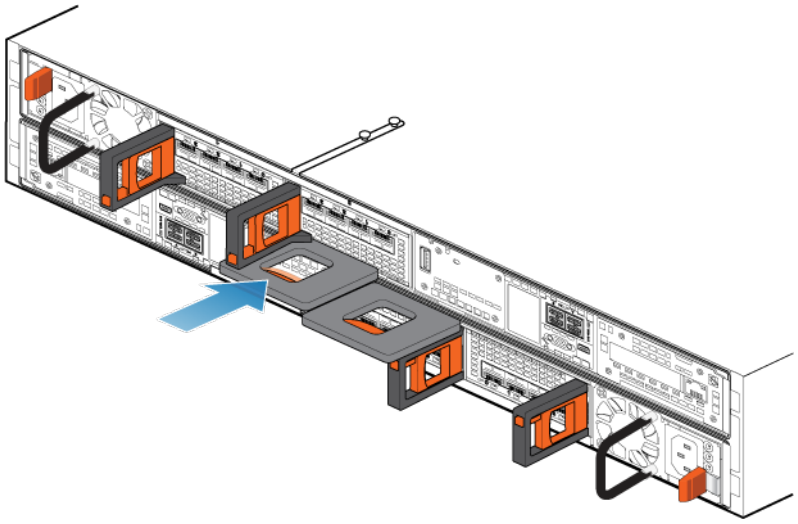


Figure 156. Installing the node

4. Reconnect the back-end cables and the cables to the I/O modules and network ports.
5. Pull the orange release trigger and push in gently to re-engage the locking mechanism.
   If the black release tab comes out when pulled, the locking mechanism is not engaged.
6. If the node came with a node ID plug, push the node ID plug onto the node handle.
7. Plug in the power cable immediately after installing the node.

CAUTION: Failure to plug in the power cable could prevent required firmware upgrades from completing.

NOTE: If there is a firmware update, the system will automatically reboot twice instead of once.

Verify the operation of a replacement node

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the node.
3. On the **Components** card, under **Rear View**, expand **BaseEnclosure**.

4. Select the relevant **Node**.

   The status of the replacement node should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the node is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

3

SAS expansion enclosure service procedures

The SAS expansion enclosure contains customer-replaceable components. Follow these procedures to safely replace a failed component.

NOTE: Review the information in Safety precautions for handling replaceable units before handling replaceable parts.

Topics:

Add a drive in a SAS expansion enclosure

Take the following actions to add a new drive to a SAS expansion enclosure.

Removing the front bezel

About this task

NOTE: Remove the front bezel of the expansion enclosure to gain access to the drives. The bezel is required for EMI compliance when the enclosure is powered up. Remove it only to replace or add a drive.

Steps

1. If the bezel has a lock, insert the key that shipped with your enclosure into the lock, and turn the key to unlock the bezel.
2. Press the two latch buttons on the bezel surface to release the bezel from the cabinet.
3. Pull the bezel off the cabinet, and put it on a clean, static-free surface.

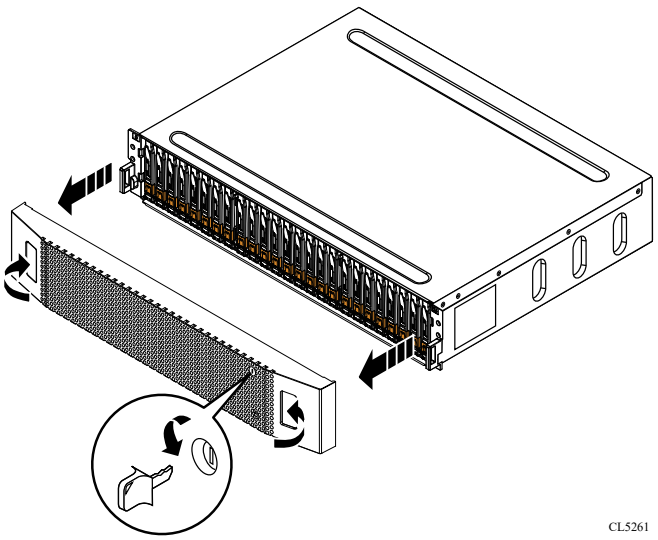


Figure 157. Removing the front bezel

Remove a drive filler module

Steps

1. Insert your finger into the cutout on the drive filler module.
2. Pull the filler module out of the slot.

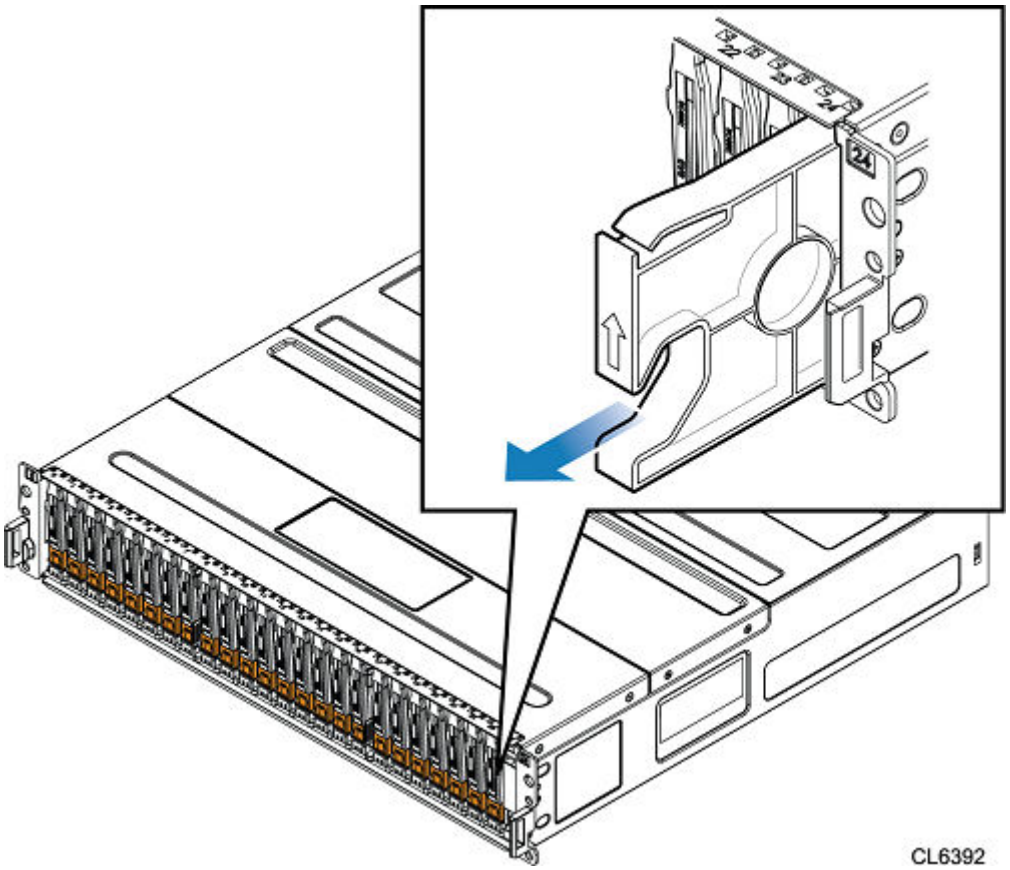


Figure 158. Removing a drive filler module

Installing a drive

About this task

NOTE: If you are installing multiple drives in a system that is powered up, wait at least 10 seconds before sliding the next drive into position, but do not exceed 2 minutes. This will allow the system to determine the best RAID width.

NOTE: Drives must be installed from left-to-right starting with the first available slot.

Steps

1. Align the drive with the guides in the slot.
2. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
3. Push the orange button until the drive is fully seated in the slot.
4. Push the latch down until it locks into place.

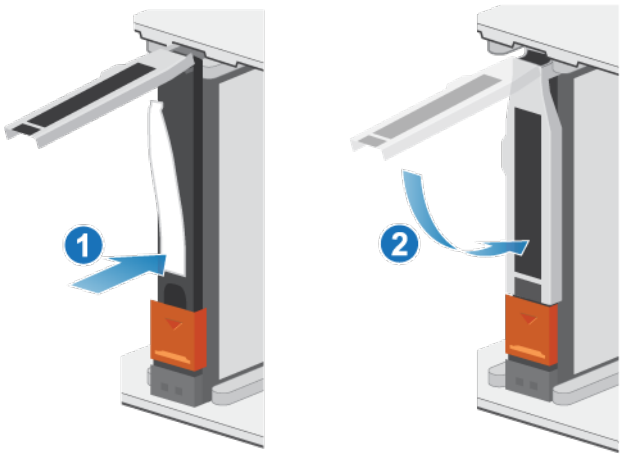


Figure 159. Installing a drive

The activity light flashes to indicate that the spin-up sequence has begun.

Installing the front bezel

Steps

1. Align the bezel with the enclosure.
2. Gently push the bezel into place on the cabinet until it latches.
3. If the bezel has a keylock, lock the bezel with the provided key.

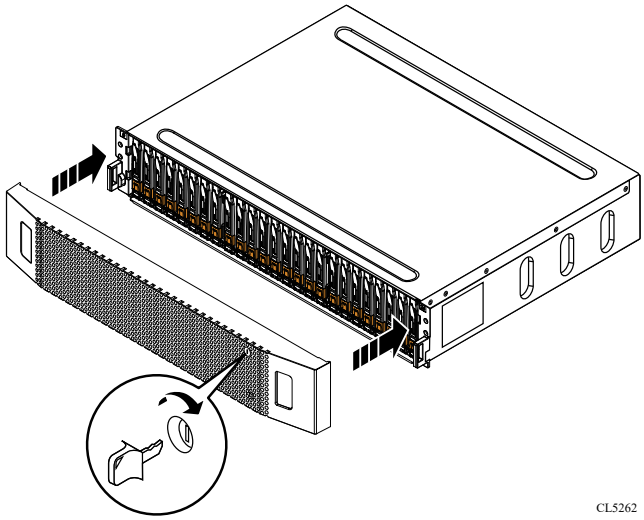


Figure 160. Installing the bezel

Verify the operation of an added drive

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you added the drive.
3. On the **Components** card, under **Drives**, expand **ExpansionEnclosure** and select the drive.

   The status of the drive should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the drive is correctly seated, or contact your service provider.

Replace a faulted drive in a SAS expansion enclosure

Take the following actions to remove a faulted drive from a SAS expansion enclosure and install a replacement drive.

NOTE: If you are proactively replacing multiple drives, use the Proactive Drive Replacement procedure available in SolVe.

Identify a faulted drive from PowerStore Manager

Before you replace a drive, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted drive.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the drive that you need to replace.
3. On the **Components** card, under **Drives**, expand **ExpansionEnclosure** and select the faulted drive.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.
4. Click **Blink LED**.
   The amber fault light on the drive starts blinking.

Removing the front bezel

About this task

NOTE: Remove the front bezel of the expansion enclosure to gain access to the drives. The bezel is required for EMI compliance when the enclosure is powered up. Remove it only to replace or add a drive.

Steps

1. If the bezel has a lock, insert the key that shipped with your enclosure into the lock, and turn the key to unlock the bezel.
2. Press the two latch buttons on the bezel surface to release the bezel from the cabinet.
3. Pull the bezel off the cabinet, and put it on a clean, static-free surface.

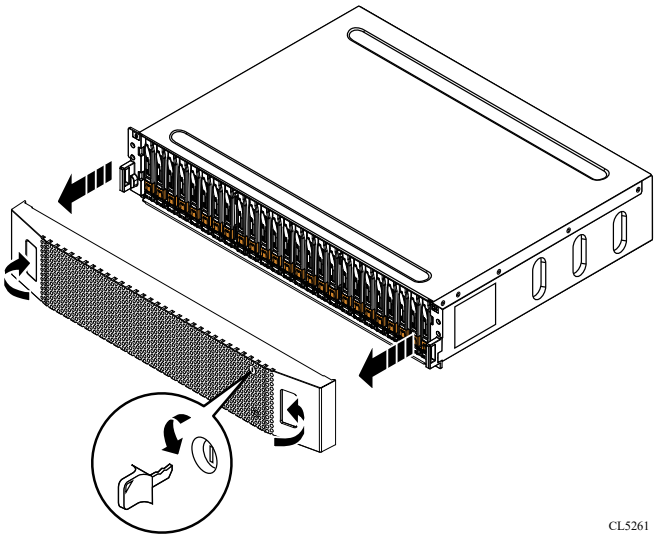


Figure 161. Removing the front bezel

Remove a faulted drive

Steps

1. Check PowerStore Manager to ensure that it is not displaying an event banner indicating that drives should not be removed.
2. Locate the drive with the blinking amber LED fault light.
3. Push down the orange button to release the latch.
4. Remove the drive from the slot.

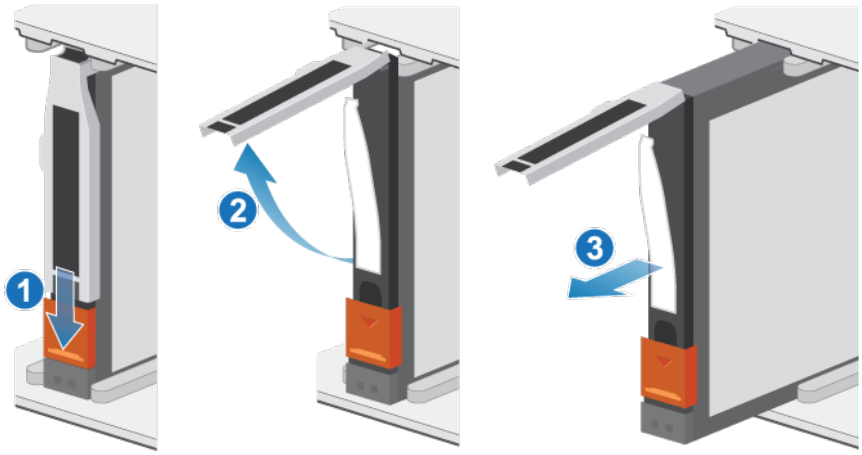


Figure 162. Removing a drive

5. Place the drive on a static-free surface.

Installing a drive

Steps

1. Align the drive with the guides in the slot.
2. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
3. Push the orange button until the drive is fully seated in the slot.
4. Push the latch down until it locks into place.

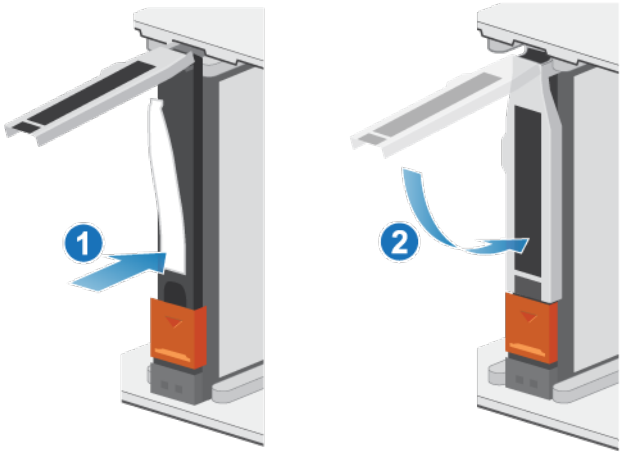


Figure 163. Installing a drive

The activity light flashes to indicate that the spin-up sequence has begun.

Installing the front bezel

Steps

1. Align the bezel with the enclosure.
2. Gently push the bezel into place on the cabinet until it latches.
3. If the bezel has a keylock, lock the bezel with the provided key.

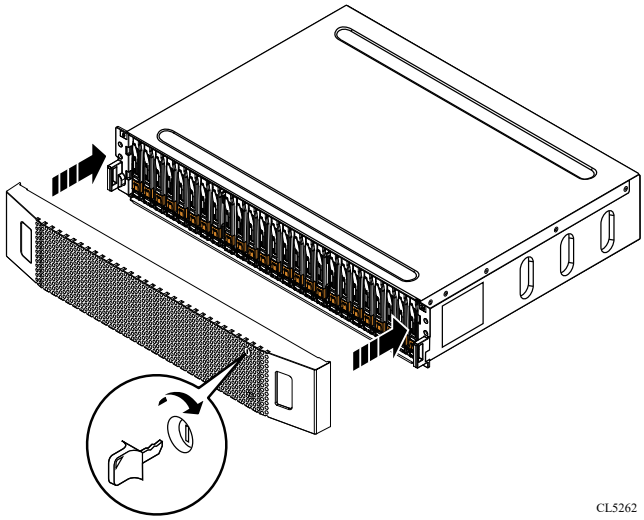


Figure 164. Installing the bezel

Verify the operation of a replacement drive

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the drive.
3. On the **Components** card, under **Drives**, expand **ExpansionEnclosure** and select the drive.

   The status of the replacement drive should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the drive is correctly seated, or contact your service provider.
4. Click **Stop Blink LED**.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.

e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a link control card in a SAS expansion enclosure

Take the following actions to remove a faulted link control card (LCC) from a SAS expansion enclosure and install a replacement LCC.

Identify a faulted LCC from PowerStore Manager

Before you replace an LCC, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted LCC.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that contains the LCC that you need to replace.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Select the relevant **LCC**.

   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Removing a faulted LCC

Prerequisites

Identify the faulted LCC by it amber fault LED.

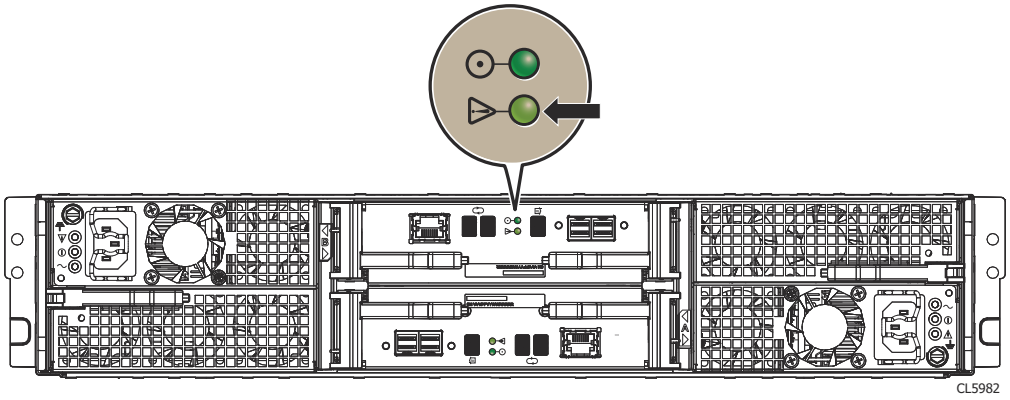


Figure 165. LCC fault LED

About this task

CAUTION: The DAE must have at least one LCC installed while the enclosure is powered up; do not remove both LCCs while AC power is on.

Steps

1. Attach an ESD wristband to your wrist and the enclosure.
2. Remove each cable connected to the LCC by gently pulling the connector latches to release the cable from the connector.

   Note where the cables connect to the LCC because you will reconnect them later.

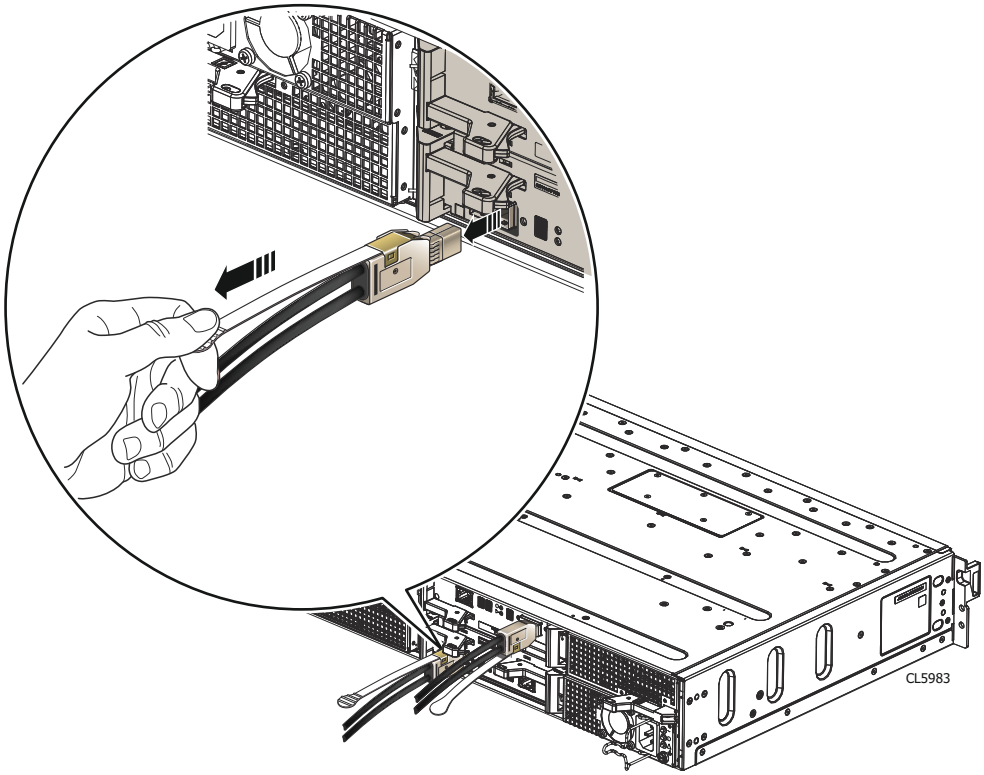


Figure 166. Disconnecting an LCC cable

3. Remove the LCC:

   CAUTION: The LCC comes completely out of the DAE chassis. In addition to holding the latches, be prepared to support the LCC to avoid dropping it.

   a. Locate the orange handle buttons on the LCC handles.
   b. Press the orange handle buttons to release the LCC, pull the latches outward, and remove the LCC from its slot.

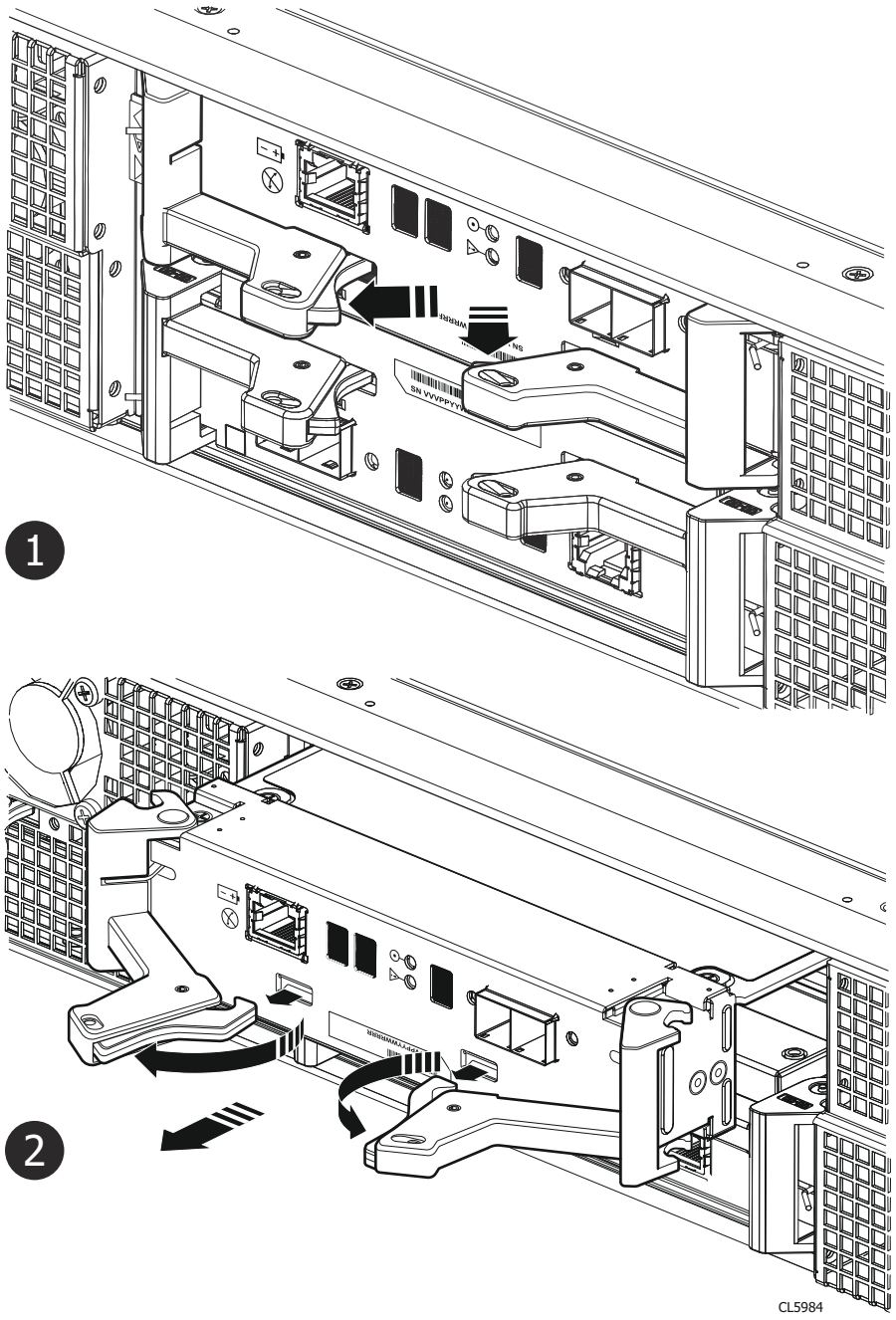


Figure 167. Removing an LCC

4. Place the LCC on a clean, static-free surface.

Installing a replacement LCC

Steps

1. Attach an ESD wristband to your wrist and the enclosure.
2. Pull out the latches on the LCC and make sure they stay in the open position.
3. Align the LCC with the enclosure opening and gently push the LCC straight into the enclosure, being sure the LCC is completely seated in the enclosure.

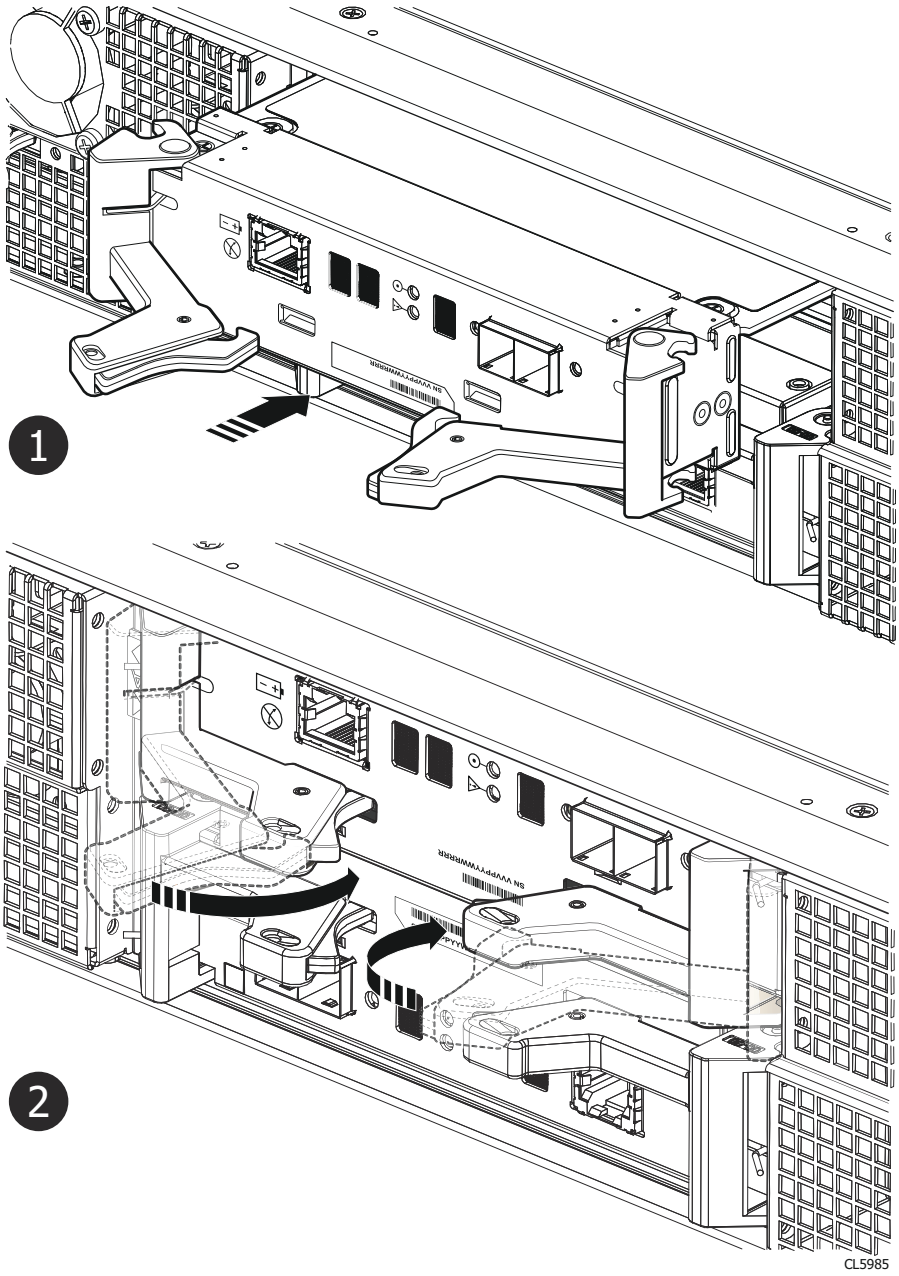


Figure 168. Installing an LCC

4. Press the latches to secure the LCC.
5. Reconnect each cable to the port from which it was removed.

Results

The LCC power LED turns on.

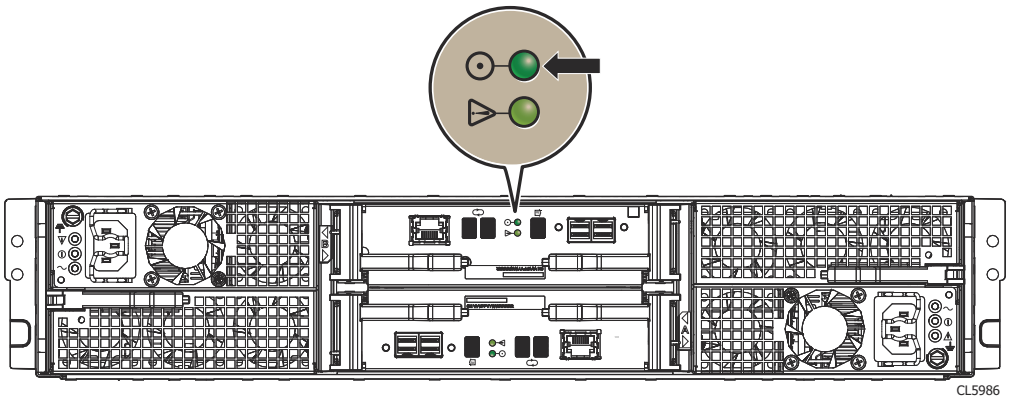


Figure 169. LCC power LED

Verify the operation of a replacement LCC

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the LCC.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Select the relevant **LCC**.

   The status of the replacement LCC should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the LCC is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a power/cooling module in a SAS expansion enclosure

Take the following actions to remove the faulted power/cooling module from the SAS expansion enclosure and install a replacement power/cooling module.

Identify a faulted power/cooling module from PowerStore Manager

Before you replace a power/cooling module, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted power/cooling module.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that contains the power/cooling module that you need to replace.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Select the relevant **PSU**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Removing a faulted power/cooling module

Prerequisites

Identify the faulted power/cooling module by the amber fault LED.

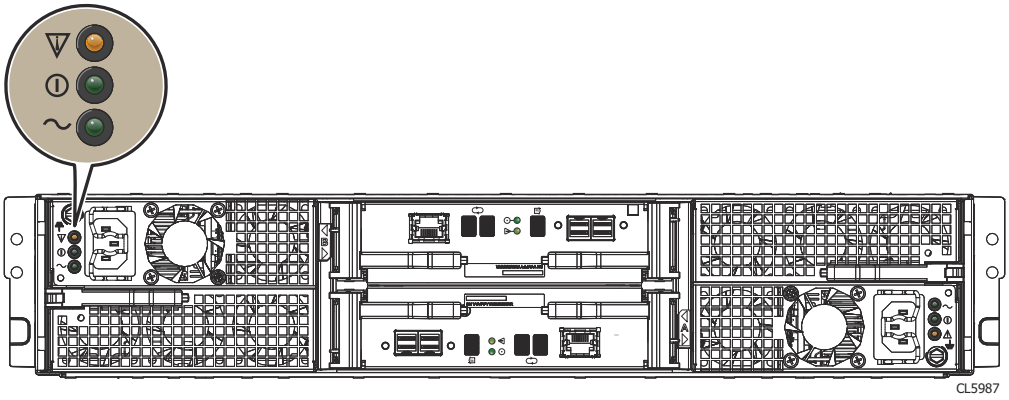


Figure 170. Fault LED on an AC power/cooling module

About this task

CAUTION: Access to the drives in your enclosure will time out and the drives will spin down two minutes after a power cooling module is removed from the enclosure. While the system can continue operating on a single power supply, the loss of two blowers causes the DAE to power off unless you replace the module within two minutes. When replacing both cooling modules, ensure that the green light on one module has been steadily on for at least 5 seconds before removing power from the second module.

Steps

1. Attach an ESD wristband to your wrist and the enclosure.
2. On an AC power/cooling module, release the cable retention bail, and unplug the power cable.

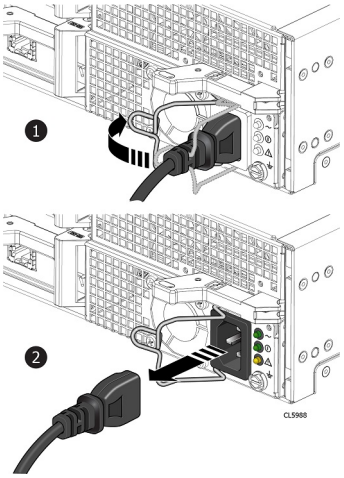


Figure 171. Unplugging the power cord from an AC power supply/cooling module

3. On a DC power/cooling module, pinch the spring releases on each side of the power cable plug and pull the plug out of the connector.

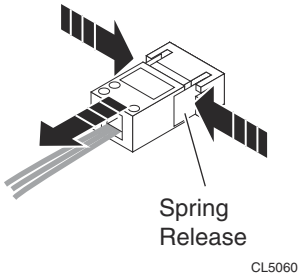


Figure 172. Unplugging the power cord from a DC power supply/cooling module

4. Remove the power/cooling module as follows:
   a. Press the orange handle button to release the module.
   b. Pull the latch outward, and remove the power/cooling module from its slot.

   CAUTION: To protect a running system from overheating, the enclosure powers off unless you replace the power cooling module within two minutes.

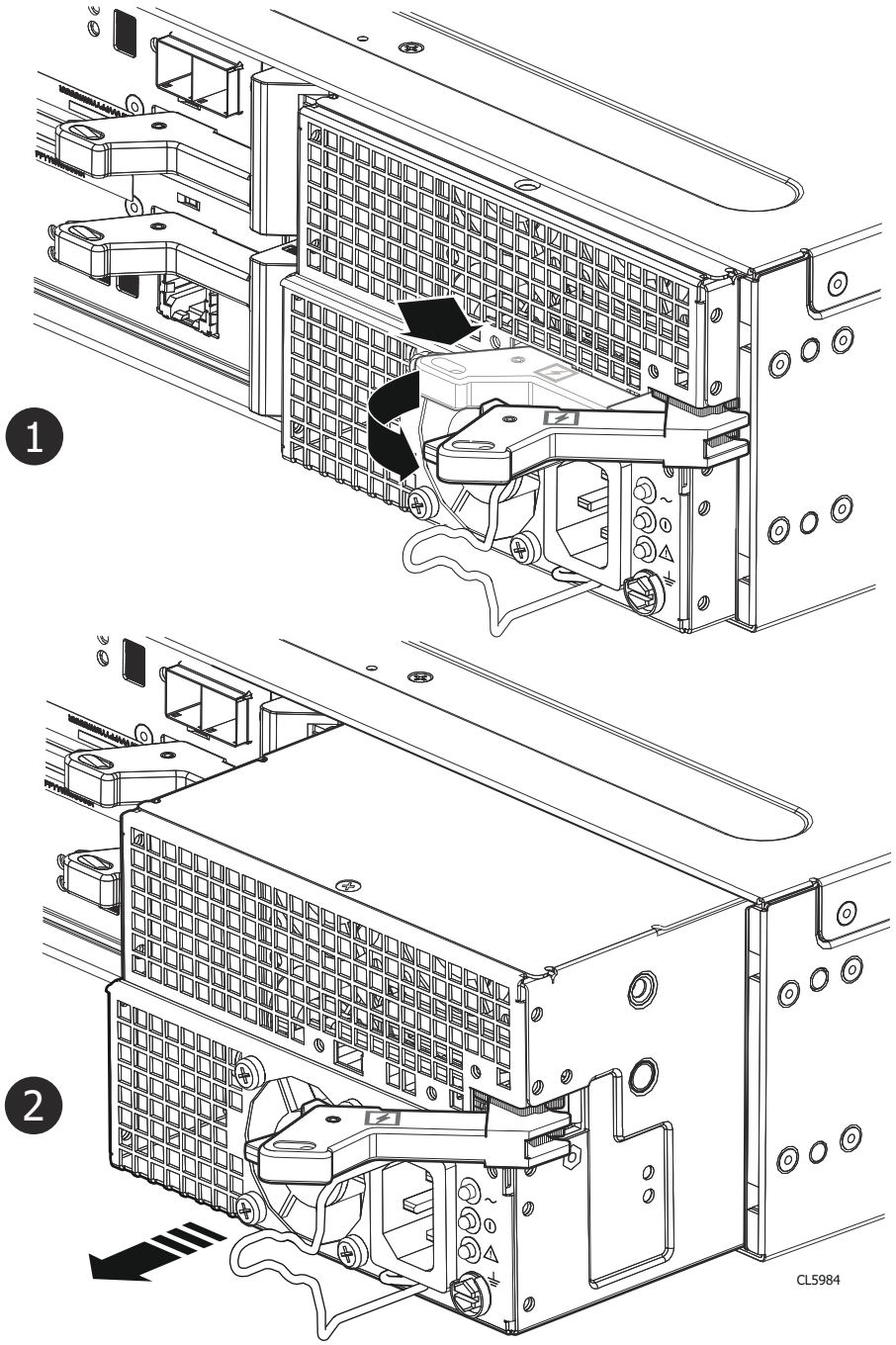


Figure 173. Removing an AC power/cooling module

Installing a replacement power/cooling module

Steps

1. Install the power/cooling module in the enclosure within two minutes:
   a. Gently insert the power/cooling module into the enclosure, being sure that the module is completely seated.
   b. Press the latch in to secure the power/cooling module.

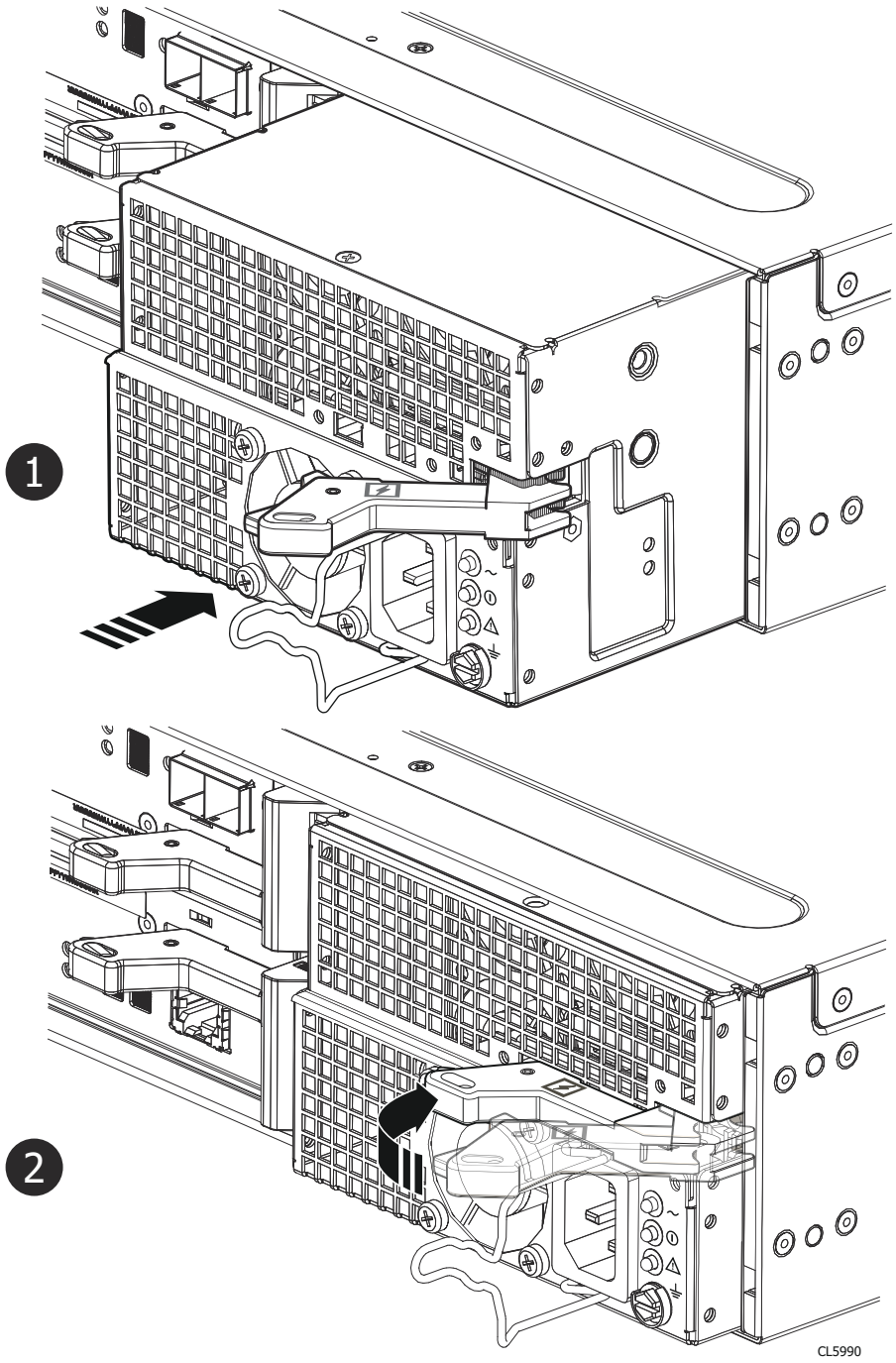


Figure 174. Installing a power/cooling module

2. For an AC power/cooling module:
   a. Plug the power cable into the power/cooling module.
   b. Secure the cord with the retention bail at the connector.

      The bail prevents the power cable from pulling out of the connector.

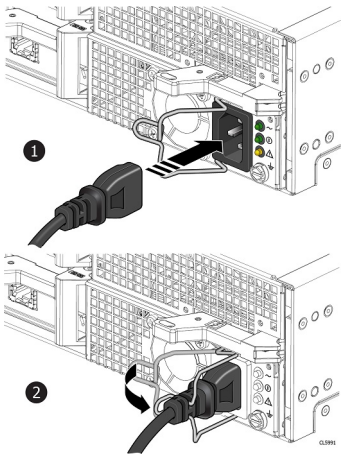


Figure 175. Plugging in the power cable

3. For a DC power/cooling module, push the power cable plug into the connector until it snaps in place.

Verify the operation of a replacement power/cooling module

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the faulted power/cooling module.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Select the relevant **PSU**.

   The status of the replacement power/cooling module should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the power/cooling module is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

4

NVMe expansion enclosure service procedures

The NVMe expansion enclosure contains customer-replaceable components. Follow these procedures to safely replace a failed component.

NOTE: Review the information in Safety precautions for handling replaceable units before handling replaceable parts.

Topics:

Add a drive in an NVMe expansion enclosure

Take the following actions to add a new drive to an NVMe expansion enclosure.

Removing the front bezel

About this task

NOTE: Remove the front bezel of the expansion enclosure to gain access to the drives. The bezel is required for EMI compliance when the enclosure is powered up. Remove it only to replace or add a drive.

Steps

1. If the bezel has a lock, insert the key that shipped with your enclosure into the lock, and turn the key to unlock the bezel.
2. Press the two latch buttons on the bezel surface to release the bezel from the cabinet.
3. Pull the bezel off the cabinet, and put it on a clean, static-free surface.

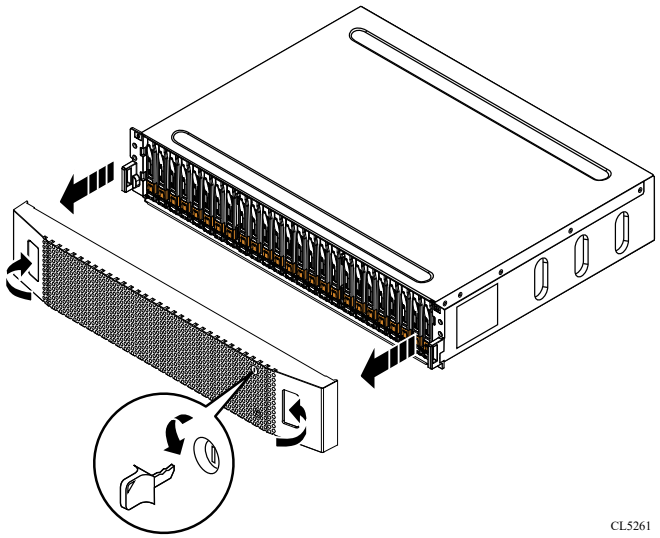


Figure 176. Removing the front bezel

Remove a drive filler module

Steps

1. Insert your finger into the cutout on the drive filler module.
2. Pull the filler module out of the slot.

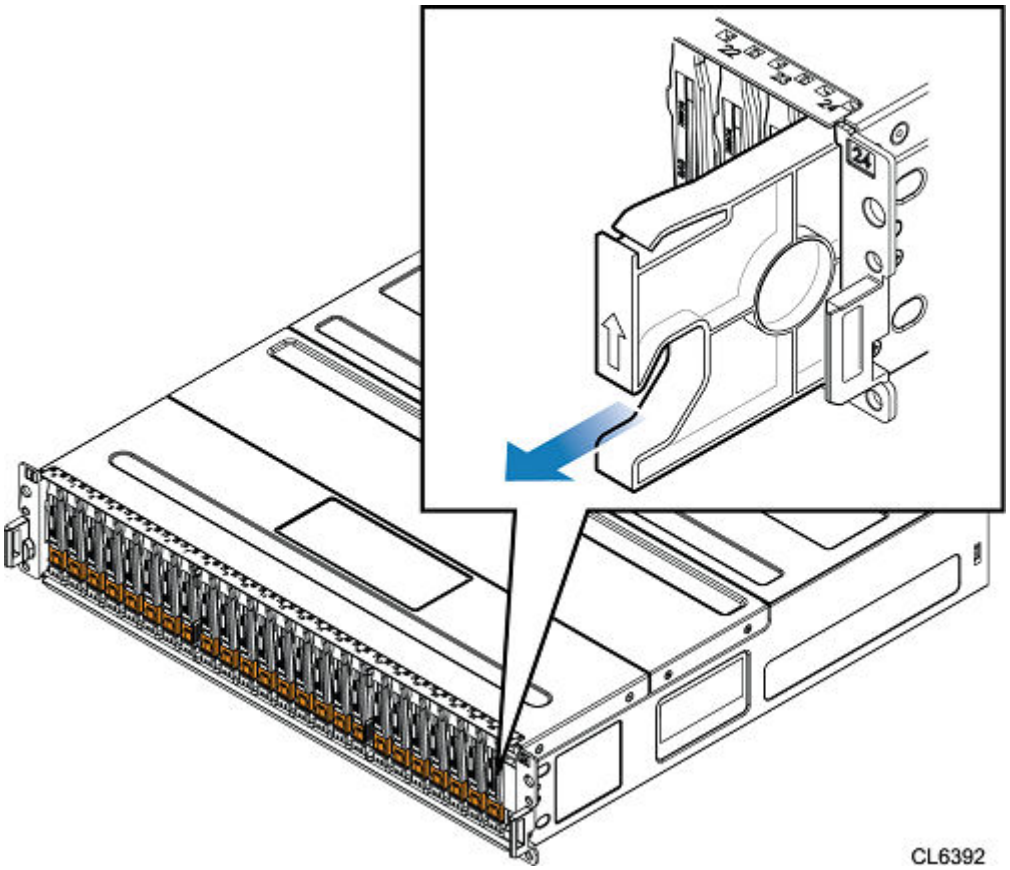


Figure 177. Removing a drive filler module

Installing a drive

About this task

NOTE: If you are installing multiple drives in a system that is powered up, wait at least 10 seconds before sliding the next drive into position, but do not exceed 2 minutes. This will allow the system to determine the best RAID width.

NOTE: Drives must be installed from left-to-right starting with the first available slot.

Steps

1. Align the drive with the guides in the slot.
2. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
3. Push the orange button until the drive is fully seated in the slot.
4. Push the latch down until it locks into place.

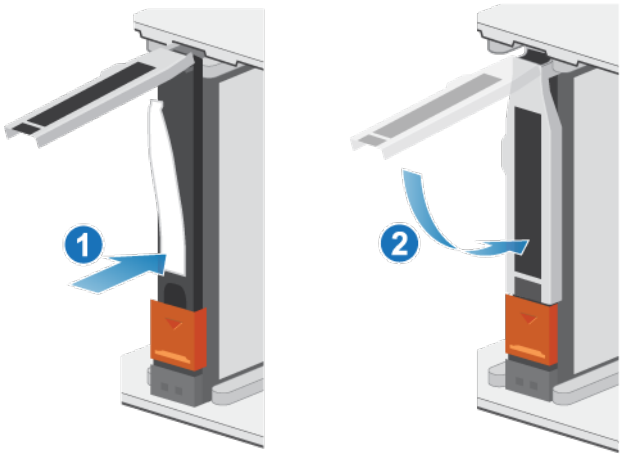


Figure 178. Installing a drive

The activity light flashes to indicate that the spin-up sequence has begun.

Installing the front bezel

Steps

1. Align the bezel with the enclosure.
2. Gently push the bezel into place on the cabinet until it latches.
3. If the bezel has a keylock, lock the bezel with the provided key.

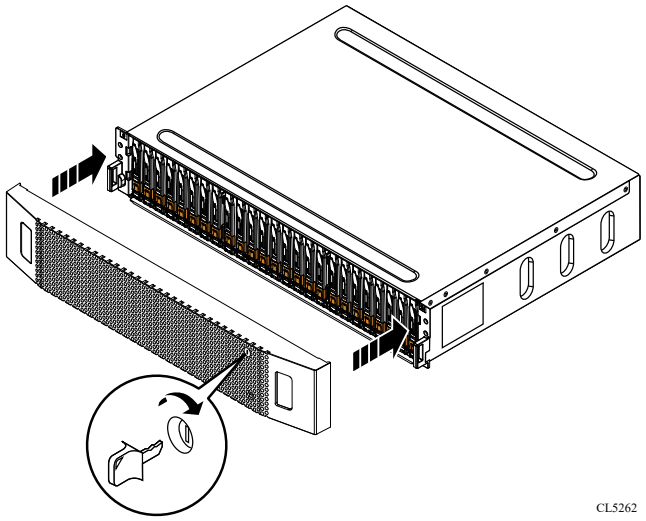


Figure 179. Installing the bezel

Verify the operation of an added drive

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you added the drive.
3. On the **Components** card, under **Drives**, expand **ExpansionEnclosure** and select the drive.
   The status of the drive should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the drive is correctly seated, or contact your service provider.

Replace a faulted drive in an NVMe expansion enclosure

Take the following actions to remove a faulted drive from an NVMe expansion enclosure and install a replacement drive.

NOTE: If you are proactively replacing multiple drives, use the Proactive Drive Replacement procedure available in SolVe.

Identify a faulted drive from PowerStore Manager

Before you replace a drive, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted drive.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the drive that you need to replace.
3. On the **Components** card, under **Drives**, expand **ExpansionEnclosure** and select the faulted drive.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.
4. Click **Blink LED**.
   The amber fault light on the drive starts blinking.

Removing the front bezel

About this task

NOTE: Remove the front bezel of the expansion enclosure to gain access to the drives. The bezel is required for EMI compliance when the enclosure is powered up. Remove it only to replace or add a drive.

Steps

1. If the bezel has a lock, insert the key that shipped with your enclosure into the lock, and turn the key to unlock the bezel.
2. Press the two latch buttons on the bezel surface to release the bezel from the cabinet.
3. Pull the bezel off the cabinet, and put it on a clean, static-free surface.

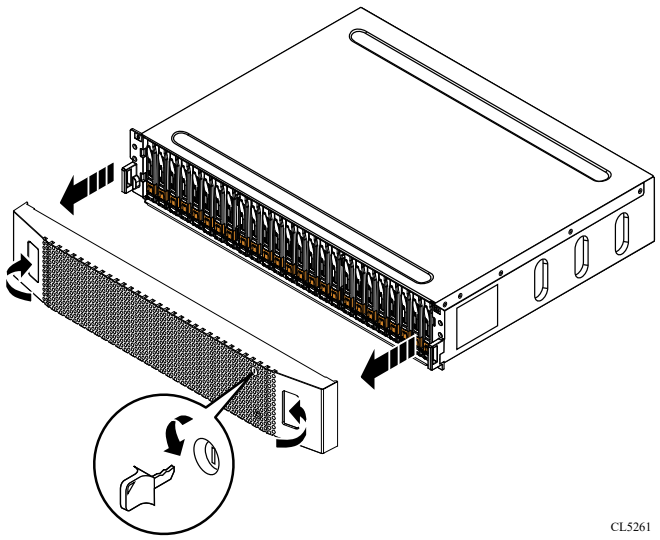


Figure 180. Removing the front bezel

Remove a faulted drive

Steps

1. Check PowerStore Manager to ensure that it is not displaying an event banner indicating that drives should not be removed.
2. Locate the drive with the blinking amber LED fault light.
3. Push down the orange button to release the latch.
4. Remove the drive from the slot.

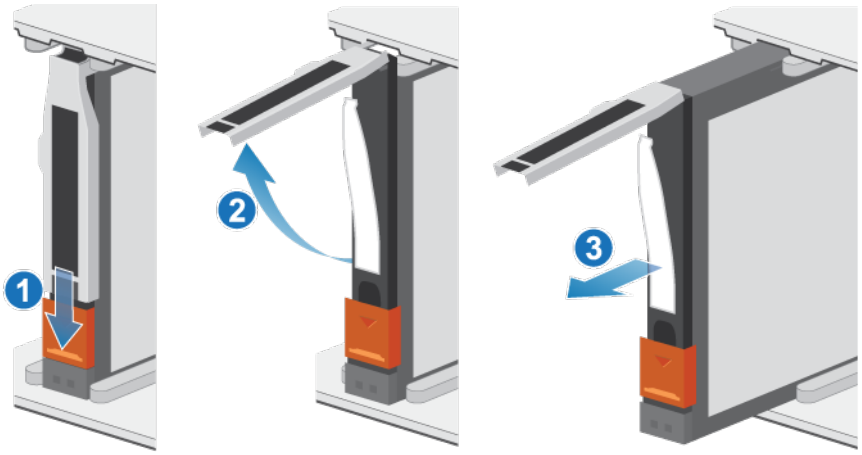


Figure 181. Removing a drive

5. Place the drive on a static-free surface.

Installing a drive

Steps

1. Align the drive with the guides in the slot.
2. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
3. Push the orange button until the drive is fully seated in the slot.
4. Push the latch down until it locks into place.

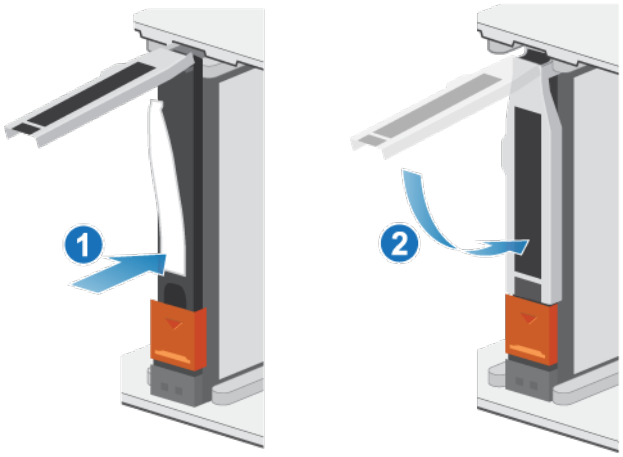


Figure 182. Installing a drive

The activity light flashes to indicate that the spin-up sequence has begun.

Installing the front bezel

Steps

1. Align the bezel with the enclosure.
2. Gently push the bezel into place on the cabinet until it latches.
3. If the bezel has a keylock, lock the bezel with the provided key.

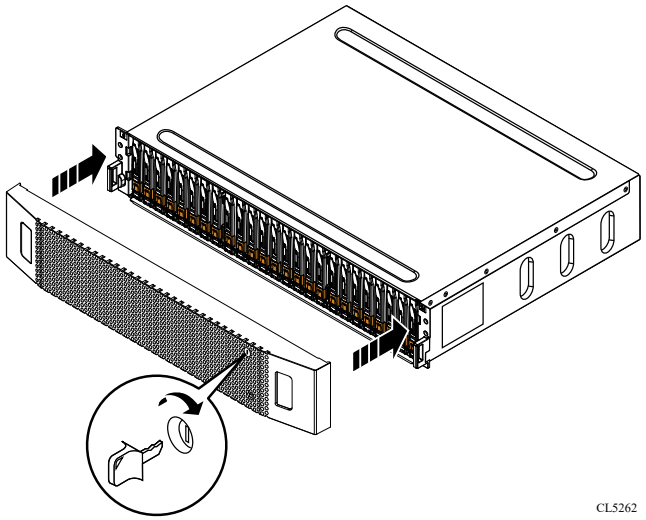


Figure 183. Installing the bezel

Verify the operation of a replacement drive

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the drive.
3. On the **Components** card, under **Drives**, expand **ExpansionEnclosure** and select the drive.

   The status of the replacement drive should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the drive is correctly seated, or contact your service provider.
4. Click **Stop Blink LED**.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a power supply module in an NVMe expansion enclosure

Take the following actions to remove the faulted power supply module from the NVMe expansion enclosure and install a replacement power supply.

Identify a faulted power supply from PowerStore Manager

Before you replace a power supply, use PowerStore Manager to identify its location within the system.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the power supply that you need to replace.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Expand the node that includes the power supply, and then select **PSU0**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

NVMe expansion enclosure power supply LEDs

Use the fault LEDs to identify the faulted part.

NOTE: The power supplies in the NVMe expansion enclosure are installed upside down.

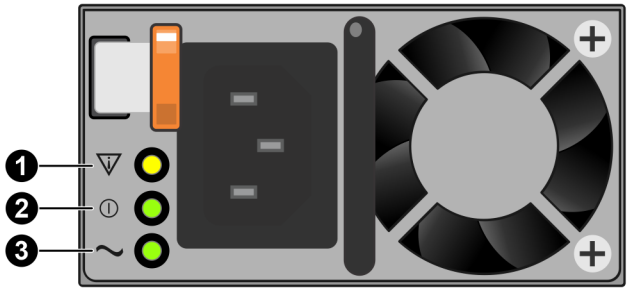


Figure 184. NVMe expansion enclosure power supply LEDs

Table 12. NVMe expansion enclosure power supply LEDs

LED	Location	State	Description
Fault	1	Solid amber	Power supply or backup fault. Check the cable connection.
		Off	No fault.
DC power (output)	2	Green	DC power is on.
		Off	DC power is off. Verify the source power.
AC power (input)	3	Green	AC power is on.
		Off	AC power is off. Verify the source power

Remove a power supply

About this task

The power supplies in the NVMe expansion enclosure are installed upside down.

NOTE: You do not need to power off the system to remove a power supply.

Steps

1. Rotate the power cable retention bail to the left. Remove the power cable from the power supply.

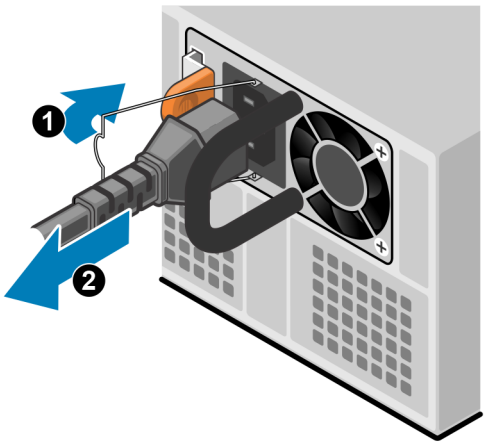


Figure 185. Removing the power cable

2. Push and hold the orange release tab to the left and grasp the power supply by its handle. Remove the power supply by pulling it from the node.

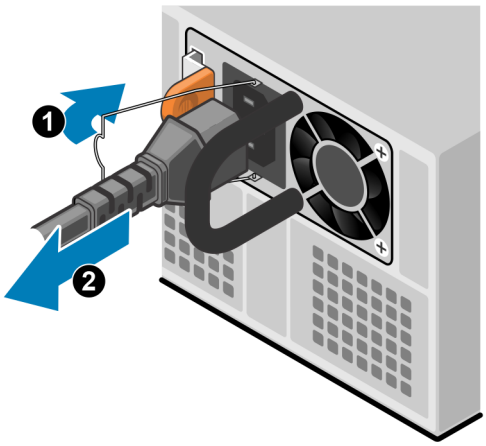


Figure 186. Removing a power supply

Install a power supply

About this task

The power supplies in the NVMe expansion enclosure are installed upside down.

Steps

1. Align the power supply with the slot in the node. The power cable retention bail is on the left.

2. Push the power supply into the node until it clicks into place.

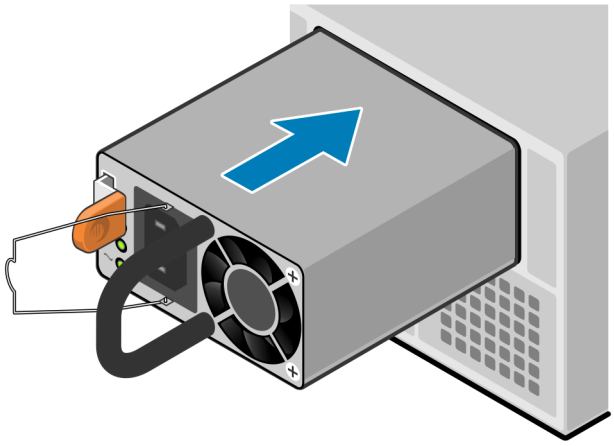


Figure 187. Installing a power supply

3. Connect the power cable to the power supply and secure the cord with the retention bail at the connector.

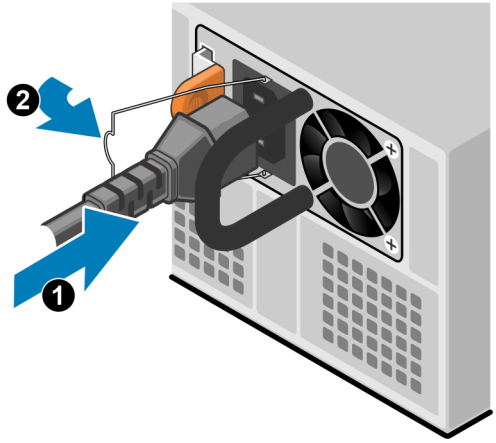


Figure 188. Inserting the power cable

Verify the operation of a replacement power supply

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the power supply.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Expand the node that includes the power supply, and then select **PSU0**.

   The status of the replacement power supply should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the power supply is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a fan module in an NVMe expansion enclosure

Take the following actions to remove the faulted fan module from the NVMe expansion enclosure and install a replacement fan.

Identify a faulted fan module from PowerStore Manager

Before you replace a fan module, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted fan module.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the fan module that you need to replace.
3. On the **Components** card, under **Internal View**, expand the node that includes the fan module, and then select the relevant **FanModule**.

   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Remove a fan module

Steps

1. Pull the expansion enclosure from the rack until the system cover is accessible.
2. Lift open the system cover.

   CAUTION: Do not leave the system cover open for more than two minutes. If you need more time, close the cover and allow the system temperature to stabilize before proceeding.

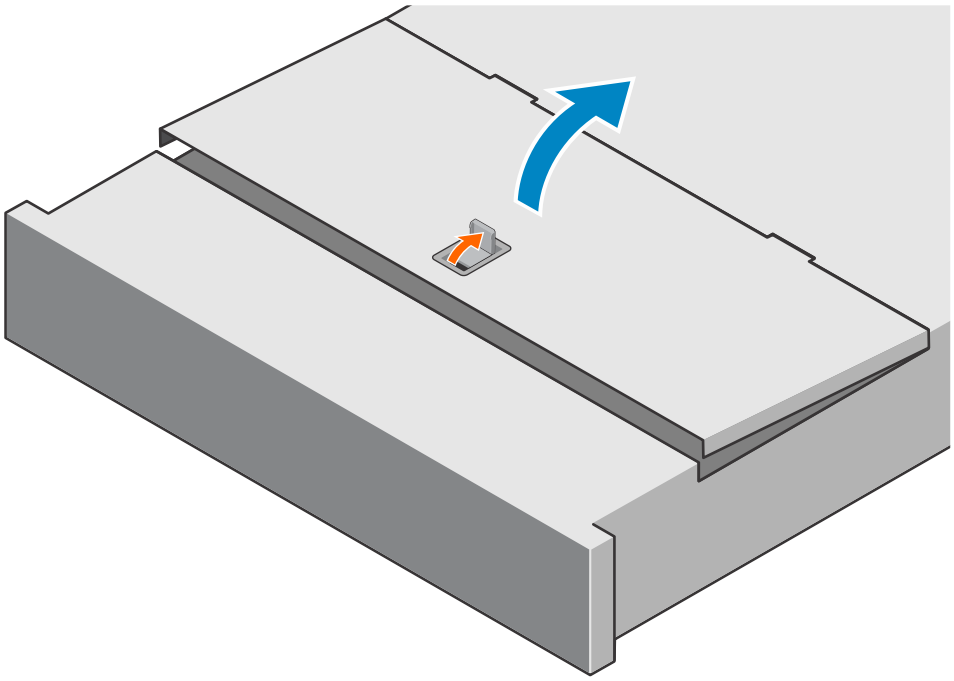


Figure 189. Lifting the system cover

3. Squeeze the orange release tabs on the fan module.
4. Lift the fan module away from the system.

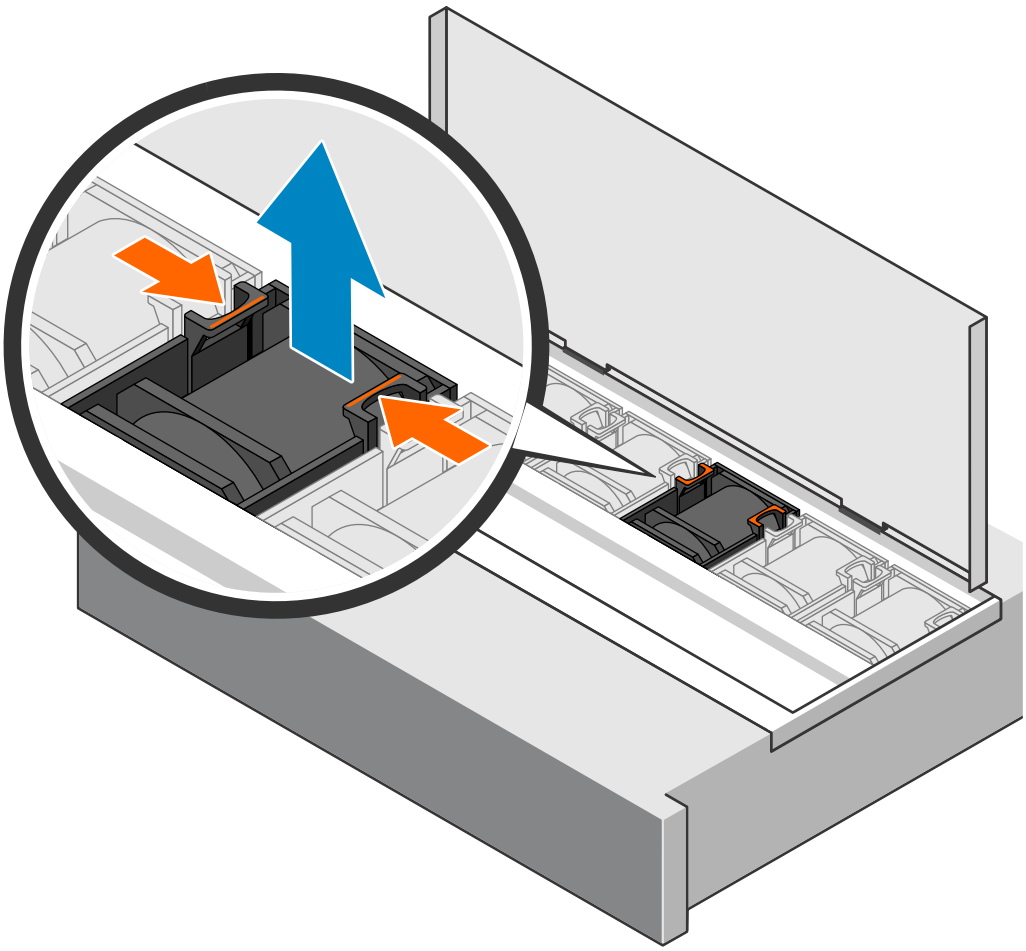


Figure 190. Removing a fan module

Install a fan module

Steps

1. Push the fan module into the empty slot.

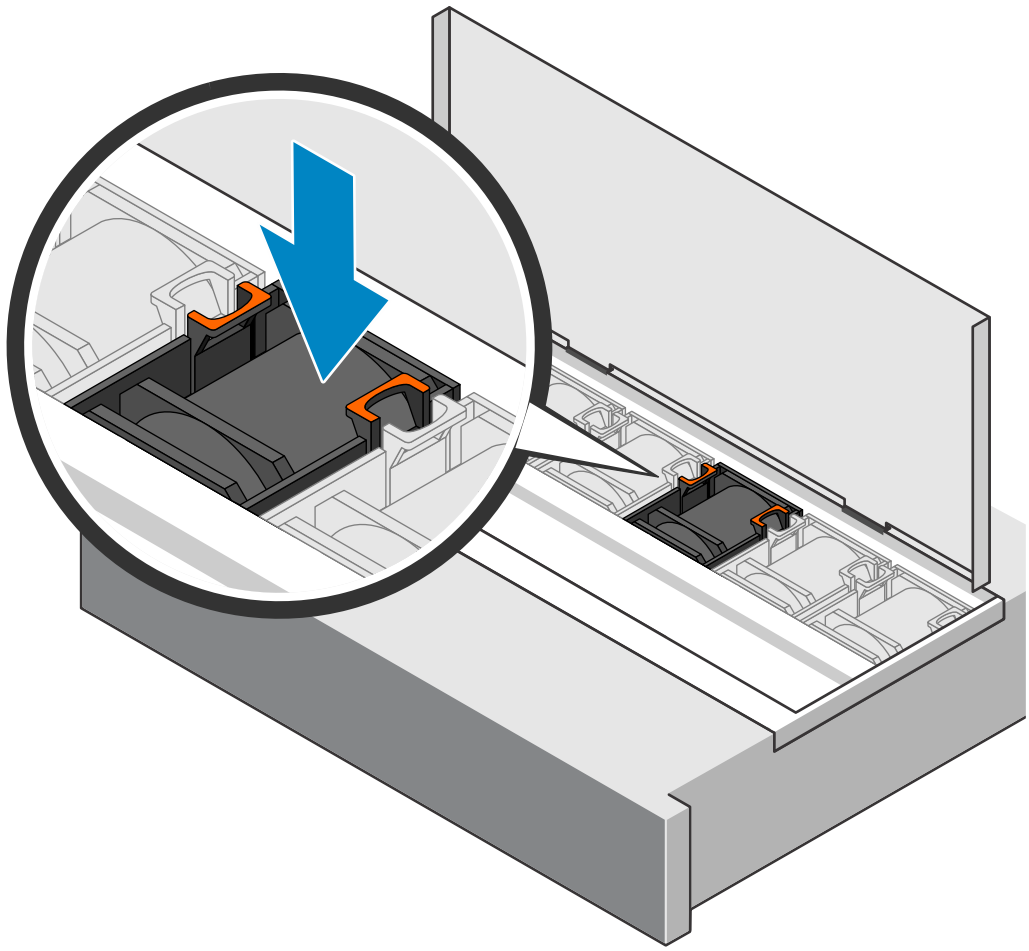


Figure 191. Installing a fan module

2. Close the system cover.

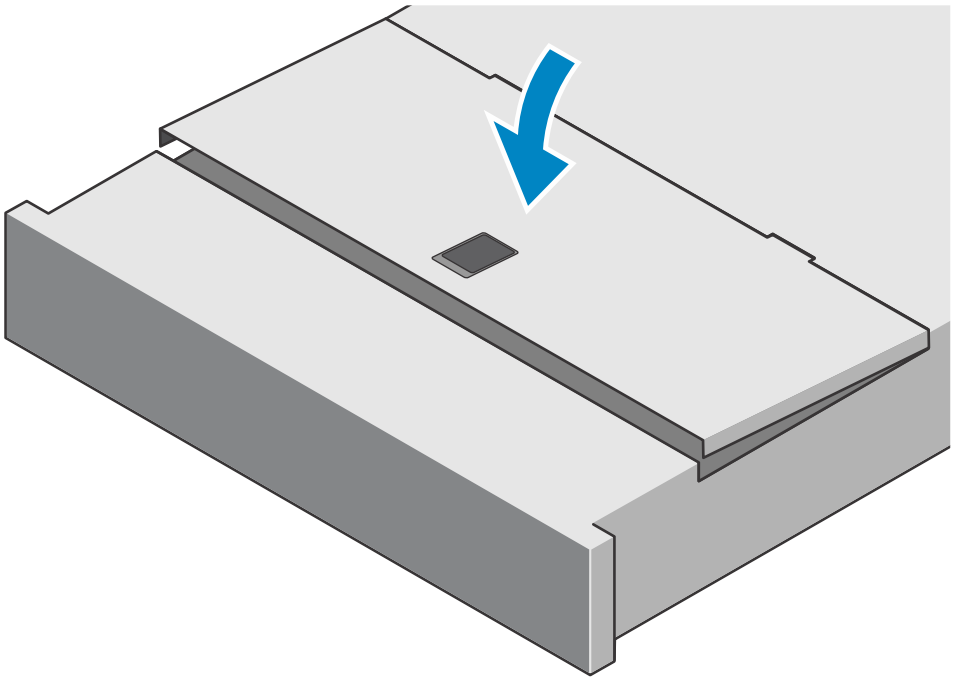


Figure 192. Closing the system cover

3. Push the expansion enclosure into the rack.

Verify the operation of a replacement fan module

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the fan module.
3. On the **Components** card, under **Internal View**, expand the node that includes the fan module, and then select the relevant **FanModule**.

   The status of the replacement fan module should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the fan module is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a Clock Distribution Board in an NVMe expansion enclosure

Take the following actions to remove the faulted Clock Distribution Board from the NVMe expansion enclosure and install a replacement Clock Distribution Board.

Identify a faulted Clock Distribution Board from PowerStore Manager

Before you replace a Clock Distribution Board, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted Clock Distribution Board.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that contains the Clock Distribution Board that you need to replace.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Select the relevant **CDB**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Remove a Clock Distribution Board.

Steps

1. Pull the expansion enclosure from the rack until the system cover is accessible.
2. Lift open the system cover.

   CAUTION: Do not leave the system cover open for more than two minutes. If you need more time, close the cover and allow the system temperature to stabilize before proceeding.

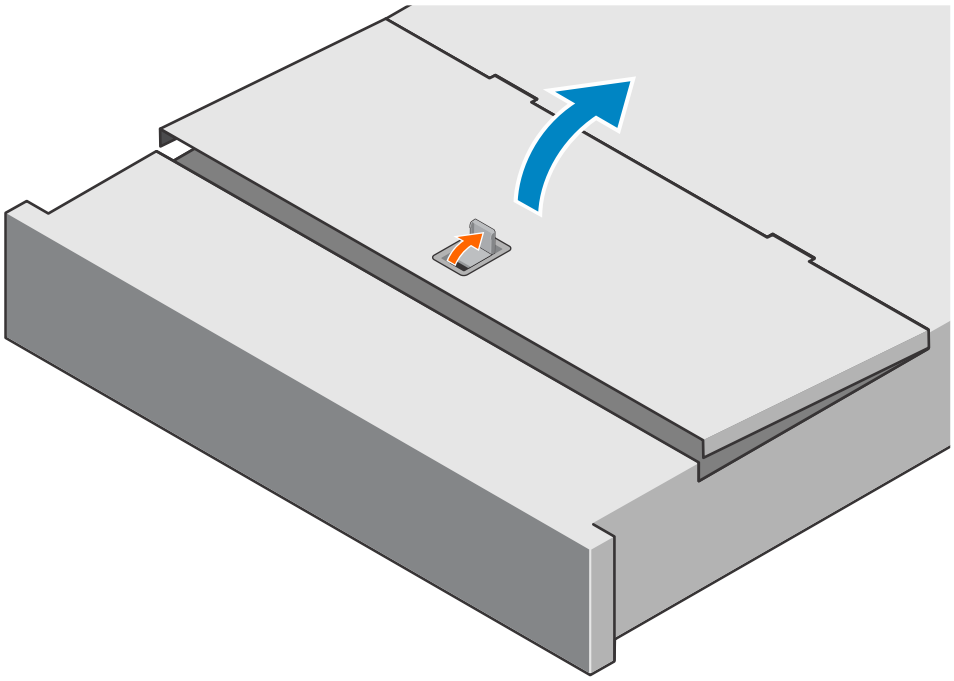


Figure 193. Lifting the system cover

3. Squeeze the orange release tabs on the Clock Distribution Board.
4. Slide the Clock Distribution Board toward the fans and then up out of the system.

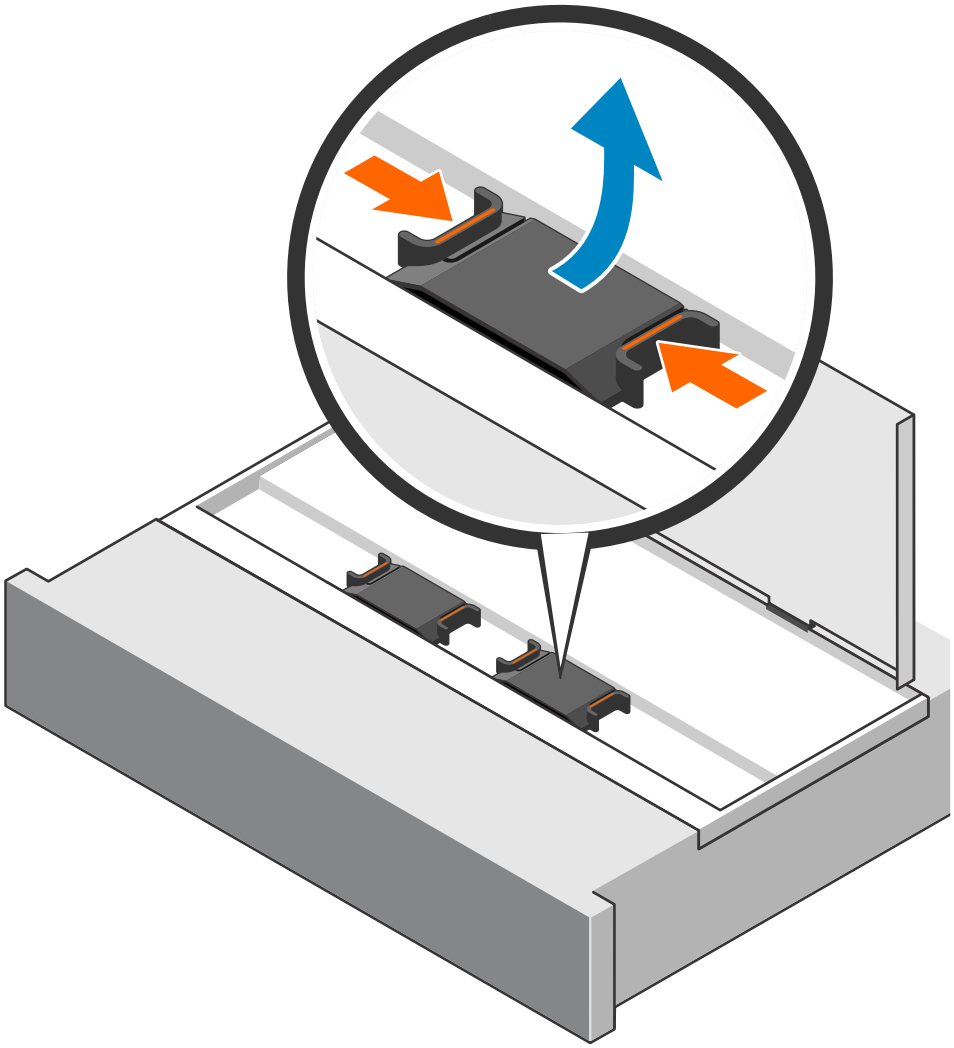


Figure 194. Removing the Clock Distribution Board

Install a Clock Distribution Board

Steps

1. Squeeze the orange tabs and align the Clock Distribution Board with the empty slot.
2. Push the Clock Distribution Board into the empty slot.

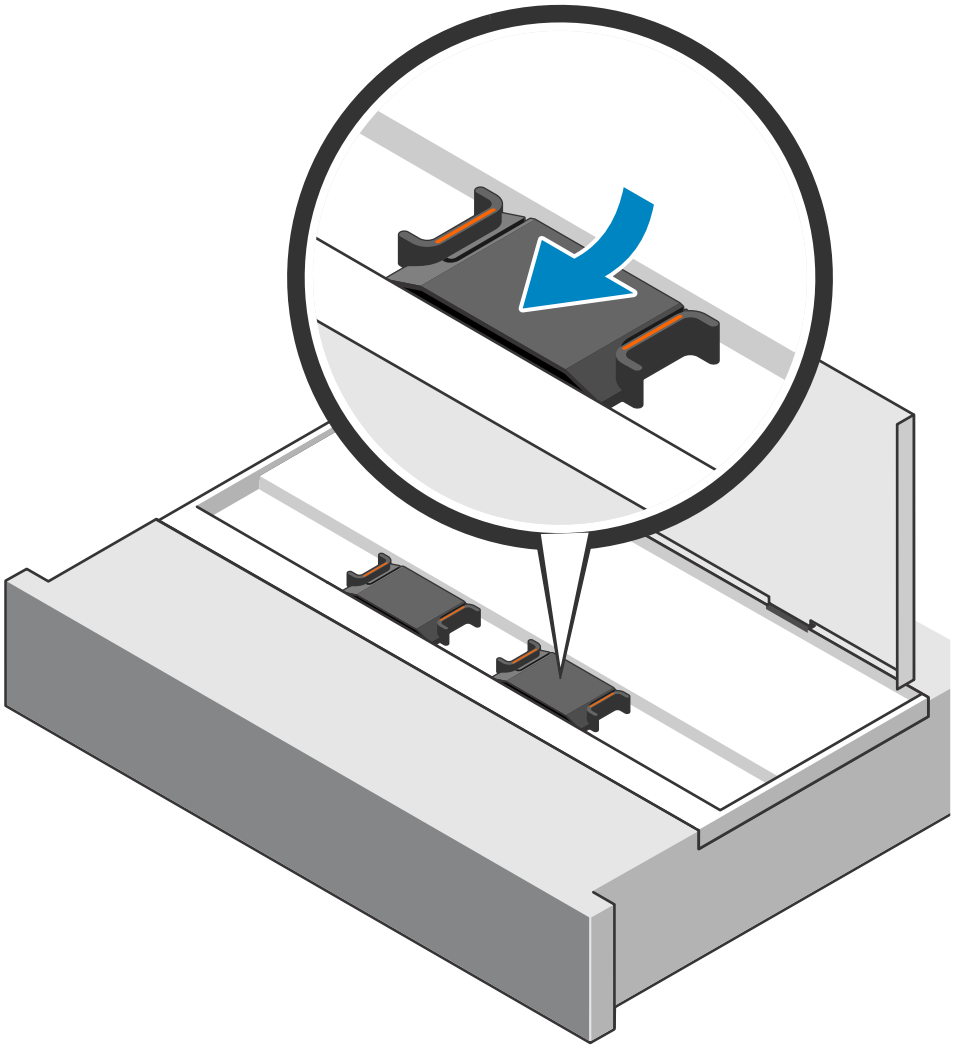


Figure 195. Installing the Clock Distribution Board

3. Close the system cover.

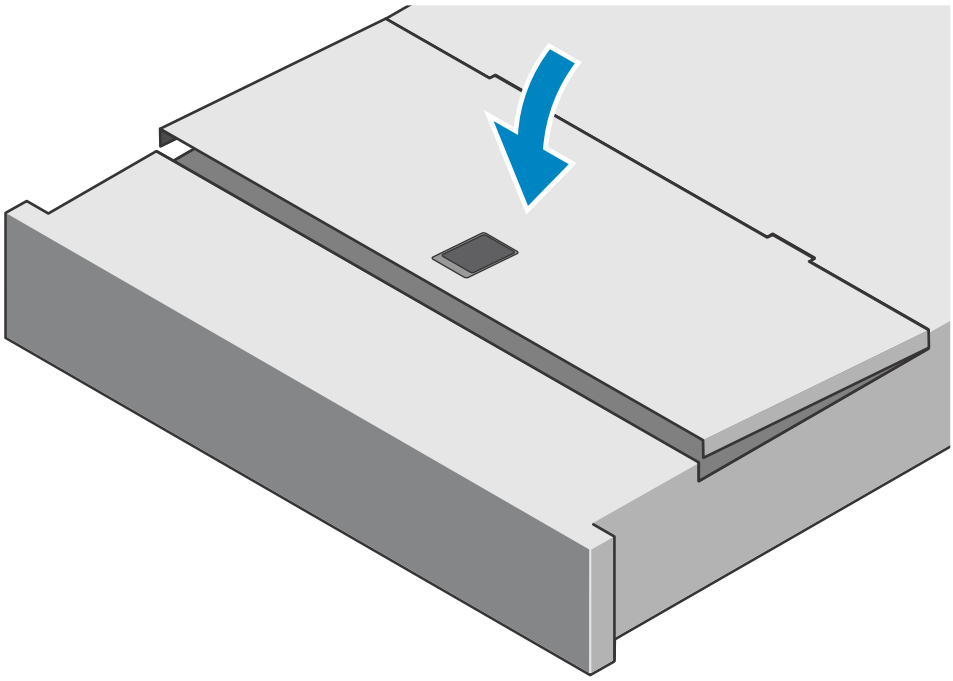


Figure 196. Closing the system cover

4. Push the expansion enclosure into the rack.

Verify the operation of a replacement Clock Distribution Board

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the Clock Distribution Board.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Select the relevant Clock Distribution Board.

   The status of the replacement Clock Distribution Board should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the Clock Distribution Board is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace an Access Module in an NVMe expansion enclosure

Take the following actions to remove the faulted Access Module from the NVMe expansion enclosure and install a replacement Access Module.

Identify a faulted Access Module from PowerStore Manager

Before you replace an Access Module, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted Access Module.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that contains the Access Module that you need to replace.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Select the relevant **Access Module**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Remove an Access Module

About this task

NOTE: Access Module 1 is on the top of the NVMe expansion enclosure and Access Module 2 is on the bottom.

Steps

1. Label and remove the cables from the Access Module.
2. Press both orange buttons to release the Access Module latches.

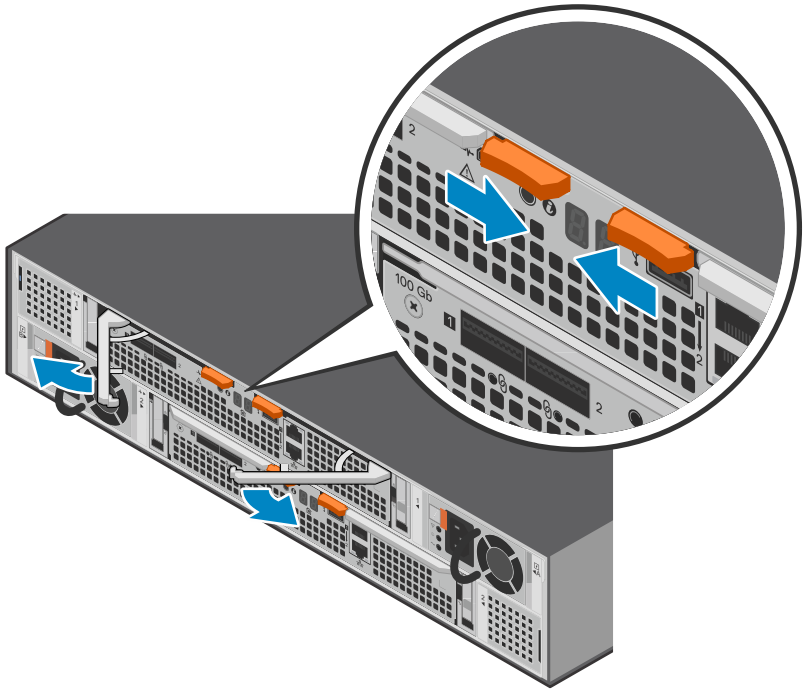


Figure 197. Releasing the Access Module

3. Pull the latches to remove the Access Module from the chassis.

   NOTE: The Access Module comes completely out of the chassis. In addition to holding the latches, be prepared to support the Access Module to avoid dropping it.

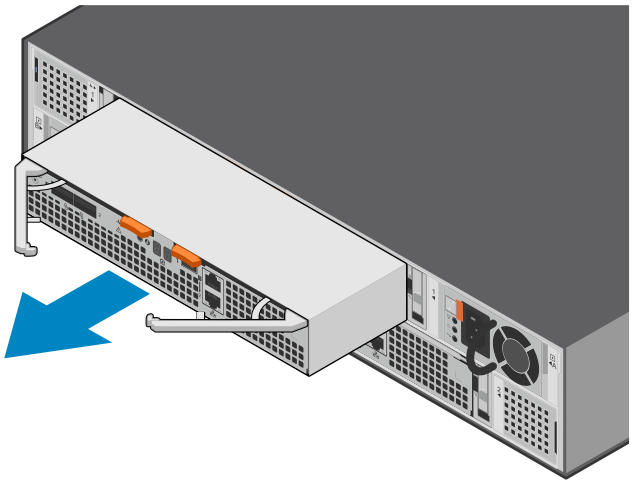


Figure 198. Removing the Access Module

Install an Access Module

Steps

1. Align the Access Module with the empty slot and carefully push it into the slot.

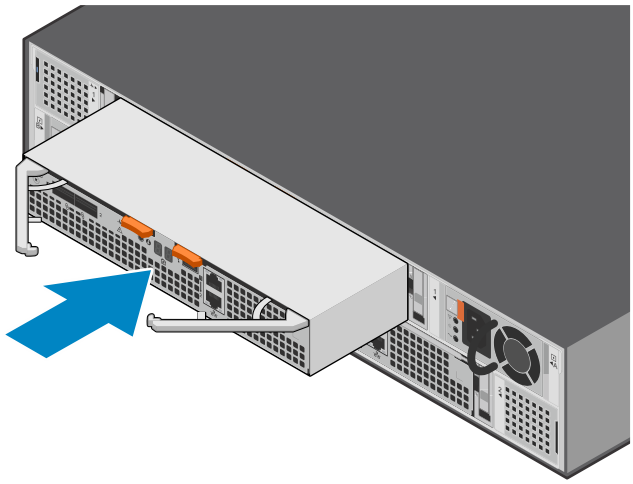


Figure 199. Installing the Access Module

2. Press in on the Access Module latches to lock them into place.

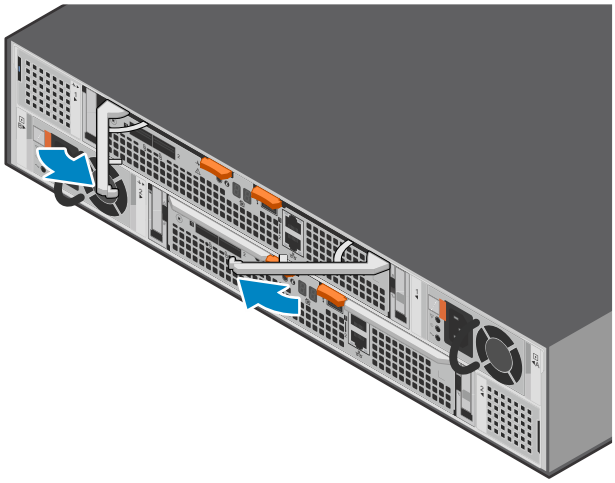


Figure 200. Locking the Access Module into place

3. Connect the cables to the Access Module.

Verify the operation of a replacement Access Module

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the Access Module.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Select the relevant **Access Module**.

   The status of the replacement Access Module should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the Access Module is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a data interface board in an NVMe expansion enclosure

Take the following actions to remove a faulted data interface board (DIB) from an NVMe expansion enclosure and install a replacement DIB.

Identify a faulted DIB from PowerStore Manager

Before you replace a DIB, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted DIB.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that contains the DIB that you need to replace.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Select the relevant **DIB**.
   Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

Removing a DIB

Steps

1. Remove the Access Module as described in Remove an Access Module.
2. Press down on both orange buttons to release the DIB latches.

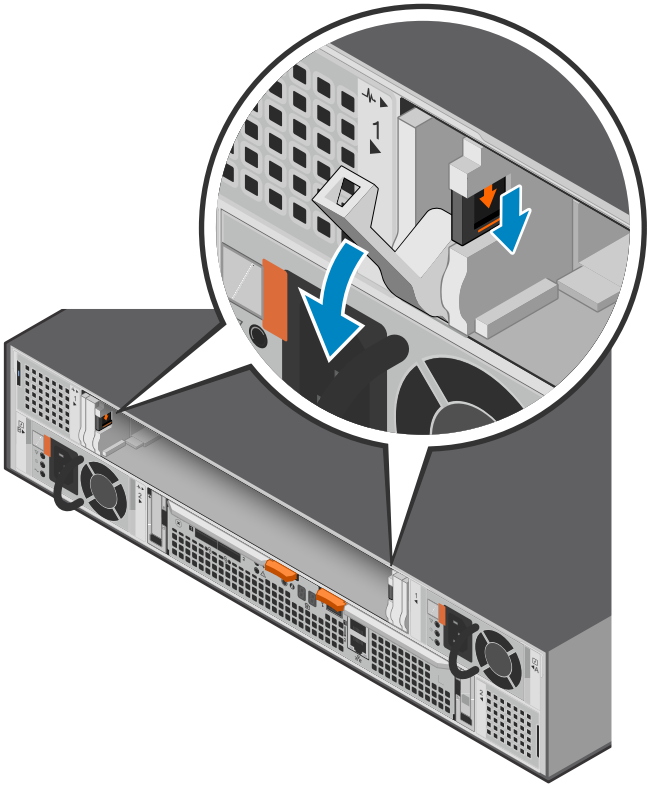


Figure 201. Releasing the DIB

3. Press down firmly on the latches, and then pull the latches to remove the DIB from the chassis.

   NOTE: The DIB comes completely out of the chassis. In addition to holding the latches, be prepared to support the DIB to avoid dropping it.

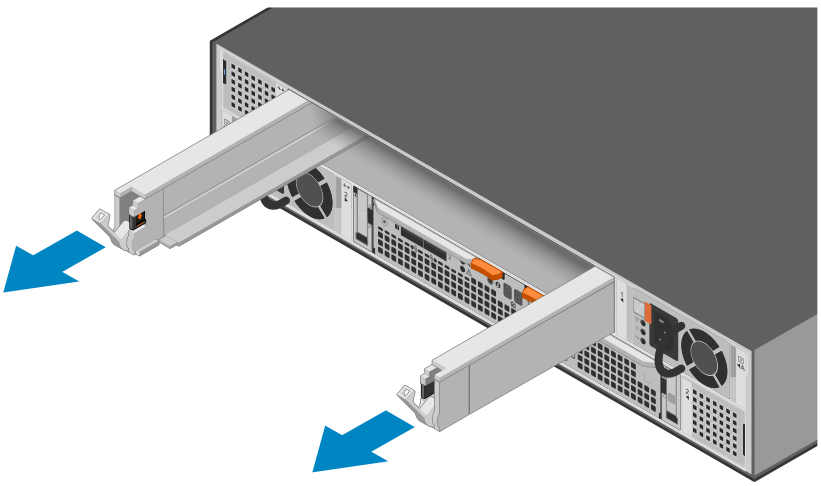


Figure 202. Removing the DIB

Replacing a DIB

Steps

1. Align the DIB with the empty slot and carefully push it into the slot until the latches are engaged and start to rise.

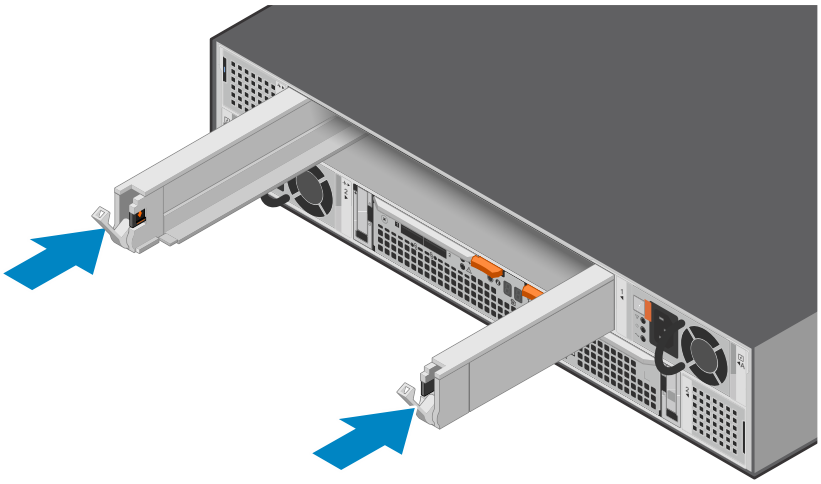


Figure 203. Installing the DIB

2. Press up on the DIB latches to lock them into place.

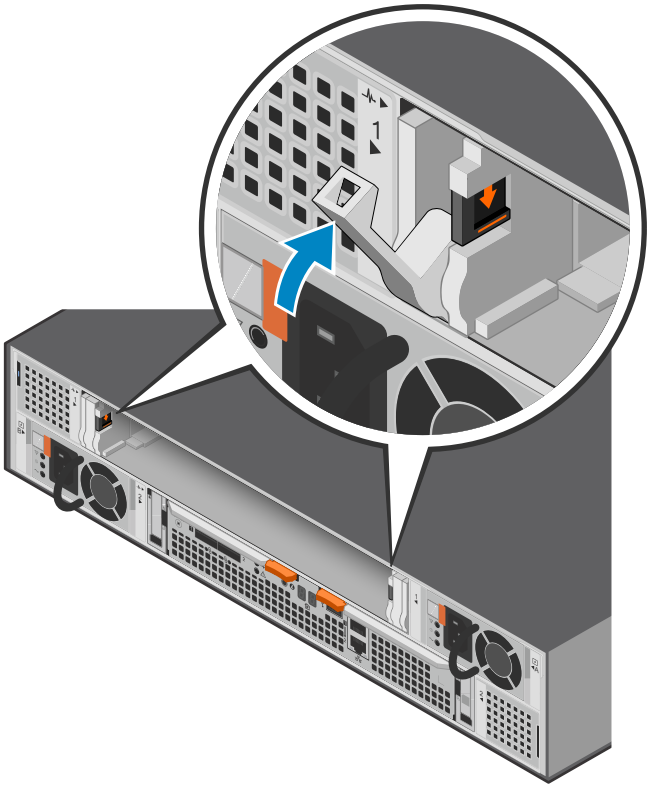


Figure 204. Locking the DIB into place

3. Replace the Access Module as described in Install an Access Module.

Verify the operation of a replacement DIB

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the DIB.
3. On the **Components** card, under **Rear View**, expand **ExpansionEnclosure**.
4. Select the relevant **DIB**.

   The status of the replacement DIB should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the DIB is correctly seated, or contact your service provider.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

Replace a dual inline memory module (DIMM)

Take the following actions to remove the faulted DIMM and install the replacement DIMM into the system.

NOTE: The DIMMs must stay in their original position. Do not move any DIMMs to a different slot.

Before you begin

CAUTION: Before starting this procedure, use the PowerStore Manager Hardware view and Alerts view to verify that the appliance and peer node are healthy with no outstanding alerts. If multiple nodes need to be removed while performing this procedure, repeat this verification for each affected node before proceeding to remove the next node. If necessary, contact your service provider before starting the replacement procedure.

Identify a faulted DIMM from PowerStore Manager

Before you replace a DIMM, ensure that you have identified its location within the system. Using PowerStore Manager, you can identify and locate a faulted DIMM.

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance that includes the DIMM that you need to replace.
3. On the **Components** card, under **Internal View**, expand **ExpansionEnclosure**.
4. Select the relevant **DIMM**.

Faulted parts appear in red in the image of the system, and report a status of `Faulted` in the **State** field.

5. You can also identify a faulted DIMM by using the following commands:
   To display the DIMM information:

```
svc_diag list --expansion_hardware --sub_option dimm
```

   To display the status of the NVMe expansion enclosure:

```
svc_diag list --expansion_hardware --sub_option status
```

   To display the verbose output of all of the hardware in the NVMe expansion enclosure including health and status.

```
svc_diag list --expansion_hardware
```

NOTE: The svc_diag list command takes a few minutes to run.

Remove an Access Module

About this task

NOTE: Access Module 1 is on the top of the NVMe expansion enclosure and Access Module 2 is on the bottom.

Steps

1. Label and remove the cables from the Access Module.
2. Press both orange buttons to release the Access Module latches.

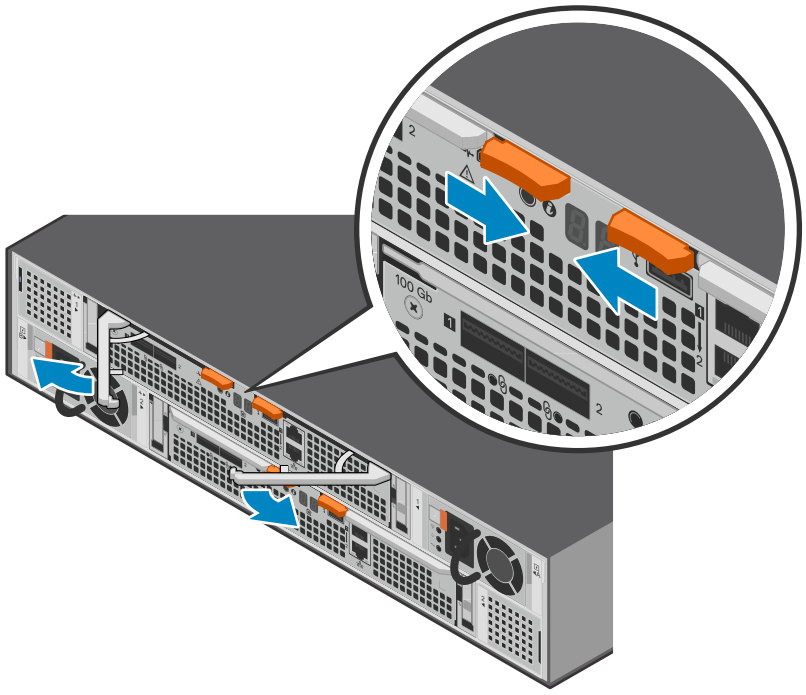


Figure 205. Releasing the Access Module

3. Pull the latches to remove the Access Module from the chassis.

NOTE: The Access Module comes completely out of the chassis. In addition to holding the latches, be prepared to support the Access Module to avoid dropping it.

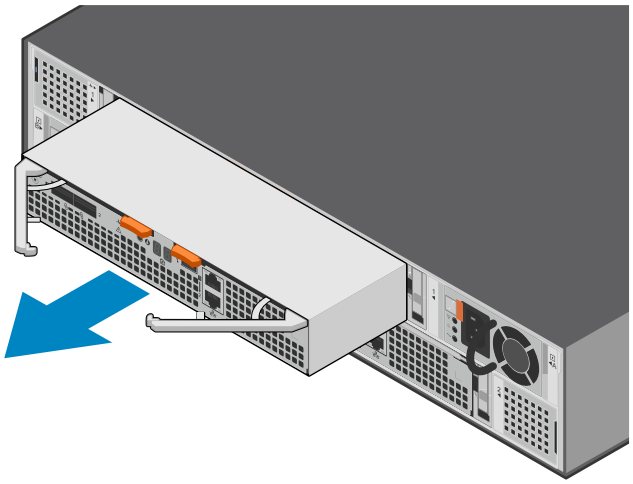


Figure 206. Removing the Access Module

Remove the faulted dual inline memory module

Steps

1. Locate the faulted DIMM in the Access Module by using the figure below as a reference for orientation.

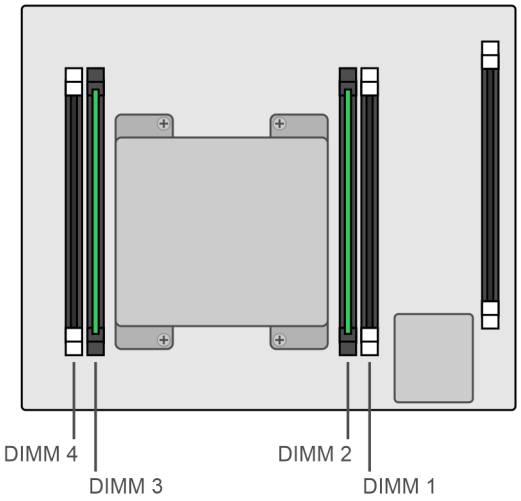


Figure 207. Top view of the Access Module

NOTE: DIMMs are installed in slots 2 and 3.

2. Press the retaining tabs downward to free the DIMM from its slot.
3. Remove the faulted DIMM.

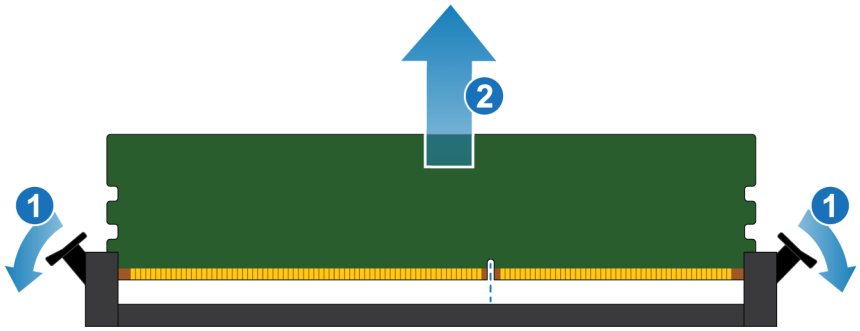


Figure 208. Removing the DIMM

Install the dual inline memory module

Steps

1. Touching only the outside edges of the DIMM, align the DIMM with the connector.
2. Press the DIMM vertically down into the socket using pressure at each end. Keep the leading edge of the DIMM parallel to the connector until it fully seats to the bottom of the socket. When the DIMM engages the contacts in the socket, you will feel resistance, and slightly more force is required to push the module down. During this stage, keep in mind the following precautions:
   - Do not insert the DIMM at an angle.
   - Do not rock the DIMM.
   - Do not insert the DIMM by pushing one end.
   - Do not seat one end of the DIMM and then the other.

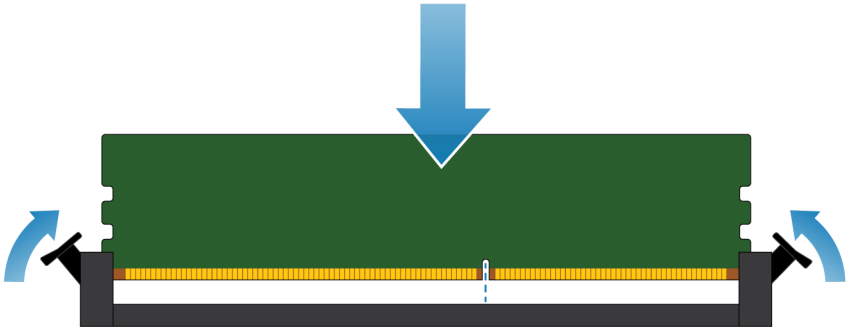


Figure 209. Installing the DIMM

3. Proper DIMM insertion automatically closes the latch ejectors and locks the DIMM into the socket. Verify that the latch ejectors are fully closed and have engaged the notches in the DIMM.

Install an Access Module

Steps

1. Align the Access Module with the empty slot and carefully push it into the slot.

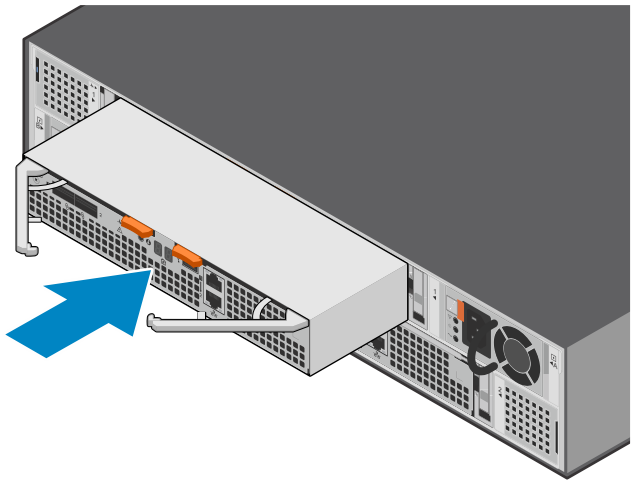


Figure 210. Installing the Access Module

2. Press in on the Access Module latches to lock them into place.

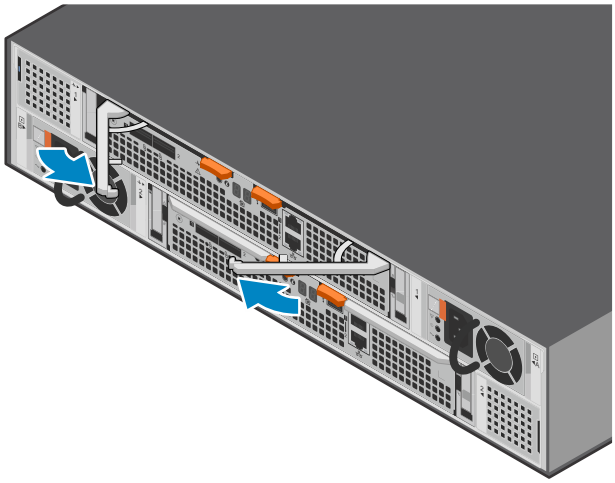


Figure 211. Locking the Access Module into place

3. Connect the cables to the Access Module.

Verify the operation of a replacement DIMM

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the appliance where you replaced the DIMM.
3. On the **Components** card, under **Internal View**, expand **ExpansionEnclosure**.
4. Select the relevant **DIMM**.

   The status of the replacement DIMM should read `Healthy`. If the status is still `Faulted`, wait a few minutes and refresh PowerStore Manager. If the status does not change, ensure that the DIMM is correctly seated, or contact your service provider.

5. You can also verify the operation of a replacement DIMM by using the following commands:
   To display the DIMM information:

   ```
   svc_diag list --expansion_hardware --sub_option dimm
   ```

   To display the status of the NVMe expansion enclosure:

   ```
   svc_diag list --expansion_hardware --sub_option status
   ```

   To display the verbose output of all of the hardware in the NVMe expansion enclosure including health and status.

   ```
   svc_diag list --expansion_hardware
   ```

   NOTE: The svc_diag list command takes a few minutes to run.

Return a faulted part

About this task

For US customers, return defective material within five business days. For International customers, return defective material within 10 business days. The materials required to return your defective part are supplied with the good part shipment.

Steps

1. Package the faulted part in the shipping box that contained the replacement part.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. For more information about returning customer-replaceable parts:
   a. Open PowerStore Manager.
   b. Click **Settings** on the upper right of the screen.
   c. Click **General Support**.
   d. Under **Drives, Power Supplies, and Other Parts**, click **Return Part**.
   e. If your screen does not show the Return Part link, contact your service provider for instructions.

5

Data-in-place upgrades

Follow this procedure to complete a data-in-place upgrade of your PowerStore hardware.

NOTE: Review the information in Safety precautions for handling replaceable units before handling parts.

Topics:

Data-in-place upgrade overview

A data-in-place upgrade allows you to upgrade your PowerStore hardware to higher-performing hardware with more processor cores and more memory. The upgrade process does not require downtime because the upgrades are completed one node at a time. The system starts a maintenance window when each node powers off and closes the maintenance window after the upgrade of that node is complete. With any node removal, I/O operations may be limited, so you should schedule the upgrade for a time of low I/O or during a scheduled maintenance.

NOTE: This procedure takes up to 2.5 hours to complete.

Table 13. x000 model upgrade paths

	PowerStore 1200	PowerStore 3200	PowerStore 5200	PowerStore 9200
PowerStore 1000	Supported	Supported		
PowerStore 3000		Supported	Supported	
PowerStore 5000			Supported	Supported
PowerStore 7000				Supported
PowerStore 9000				Supported for Block services only

Table 14. x200 model upgrade paths

	PowerStore 3200	PowerStore 5200	PowerStore 9200
PowerStore 1200	Supported		
PowerStore 3200		Supported	
PowerStore 5200			Supported

NOTE: For a data-in-place upgrade from PowerStore 5000/5200 to PowerStore 9200 with PowerStoreOS versions 3.x or 4.0.x, contact your Service Provider to ask if tuning a PowerStoreOS parameter is required to improve system stability for the upgrade. See KB article 000226681 for more information.

NOTE: The original node in your system is called the source node. The node that you are installing for the upgrade is called the target node.

NOTE: Do not add I/O modules or change the type of I/O modules or the embedded module during the upgrade.

NOTE: Before starting the data-in-place upgrade, run the System Health Check under the **Monitoring** tab to ensure the health of the array.

NOTE: Data-in-place upgrades support NVMe and SAS expansion enclosures.

Preconfigure the system with new hardware if required

If you are upgrading a PowerStore 3000 or 3200 to a PowerStore 5200, additional NVRAM drives are required. If you are upgrading to a PowerStore 9200, 2100 W power supplies are required.

The data-in-place upgrade may require you to add two NVRAM drives or replace the power supplies before beginning the upgrade. If your installation kit came with drives or power supplies, install them before starting the upgrade process.

NOTE: Before adding NVRAM drives or replacing power supplies, run the System Health Check under the **Monitoring** tab to ensure the health of the array.

NOTE: Ensure that your PDU has available C19 outlets.

Install additional NVRAM drives for a 3000 or 3200 to 5200 upgrade

If you are upgrading a PowerStore 3000 or 3200 to a PowerStore 5200, you must add NVRAM drives to slots 21 and 22 of the base enclosure. These NVRAM drives must be new drives that come with the upgrade kit.

NOTE: The drives that you insert in slots 21 and 22 during the upgrade must be the same type (FIPS or non-FIPS) as the drives in slots 23 and 24. The upgrade does not support a combination of the two drive types.

NOTE: If you want to switch from non-FIPS drives to FIPS drives, you must replace the non-FIPs drives in slots 23 and 24 before adding the new drives to slots 21 and 22. See FIPS Certified NVRAM NVMe Drive Replacement Procedure. Only authorized Dell personnel can complete this procedure. Customers should contact their service provider.

NOTE: If non-NVRAM drives occupy slots 21 and 22, contact your service provider.

Install the NVMe NVRAM drives

Steps

1. If necessary, remove the drive filler module from the drive slot.
2. Align the drive with the guides in the slot.
3. With the latch fully opened, gently push the drive into the slot.
   The latch begins to rotate downward when it meets the enclosure.
4. Push the orange button until the drive is fully seated in the slot.
5. Push the latch down until it locks into place.

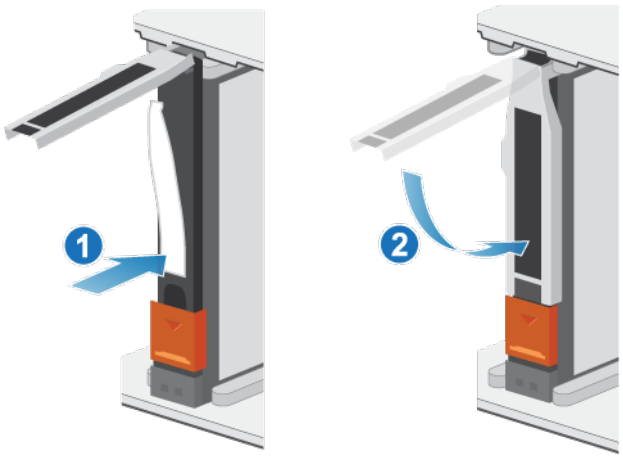


Figure 212. Installing an NVMe NVRAM drive

6. Push the latch cover into place.

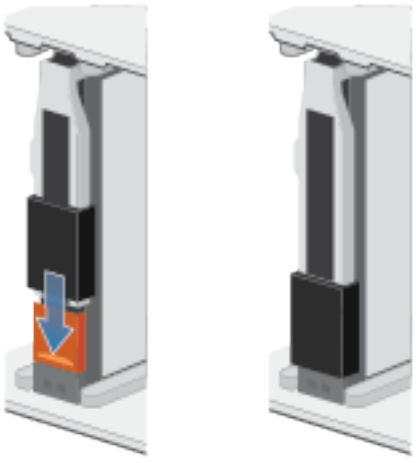


Figure 213. Pushing the latch cover into place

7. Repeat these steps for the other NVRAM drive.

NOTE: After you install the new NVRAM drives, the system displays alerts that the new drives are in incorrect slots. You can ignore these alerts. The system clears them when the data-in-place upgrade begins.

Replace power supplies

If you are upgrading to a PowerStore 9200, and the power supplies in your appliance are 1800 W, you must replace the power supplies with 2100 W power supplies before starting the upgrade.

CAUTION: Replace one power supply at a time.

NOTE: Ensure that your PDU has available C19 outlets.

Remove a power supply

About this task

There are two power supplies. The power supplies are installed in the top and bottom nodes, and the top power supply is installed upside-down. This procedure works for removing either power supply, but the direction in which the retention bail and release handle are pressed is reversed for the upside-down power supply.

NOTE: It is not necessary to power off the system to remove a power supply.

Steps

1. Verify that both power supply cable retention bails are securely in place and both power supplies are powered on.
2. Rotate the power cable retention bail to the left (to the right for the upside-down power supply). Remove the power cable from the power supply.

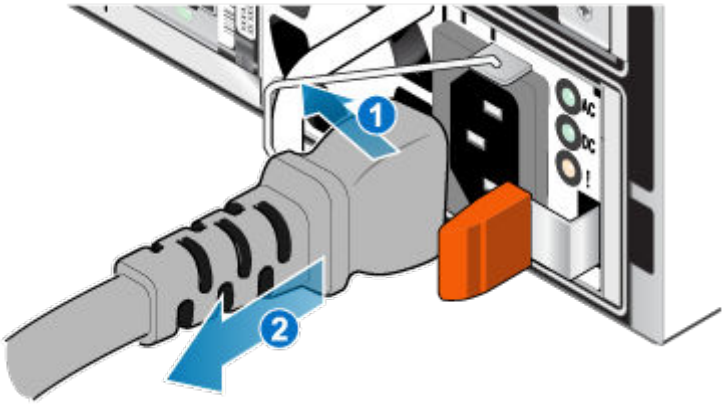


Figure 214. Removing the power cable

3. Push and hold the orange release tab to the left (to the right for the upside-down power supply) and grasp the power supply by its handle. Remove the power supply by pulling it from the node.

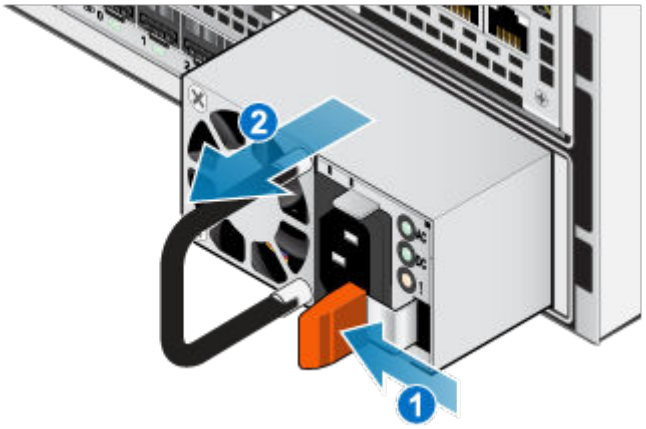


Figure 215. Removing the power supply

Install a power supply

About this task

The power supplies are installed in the top and bottom nodes, meaning that the top power supply is installed upside-down. This procedure works for installing either power supply.

Steps

1. Align the power supply with the slot in the node.
2. Push the power supply into the node until it clicks into place.

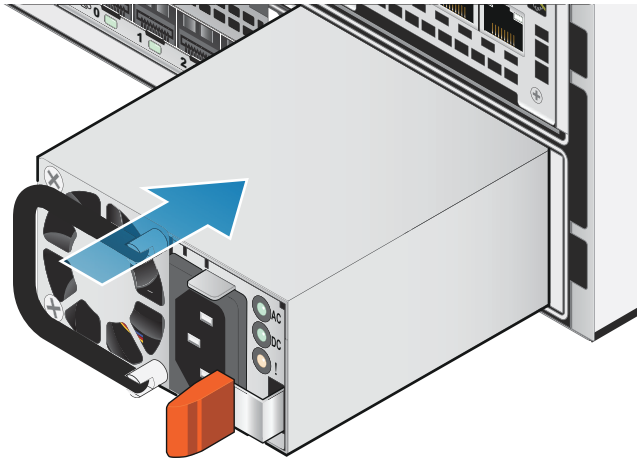


Figure 216. Installing a power supply

3. Connect the power cable to the power supply and secure the cord with the retention bail at the connector.

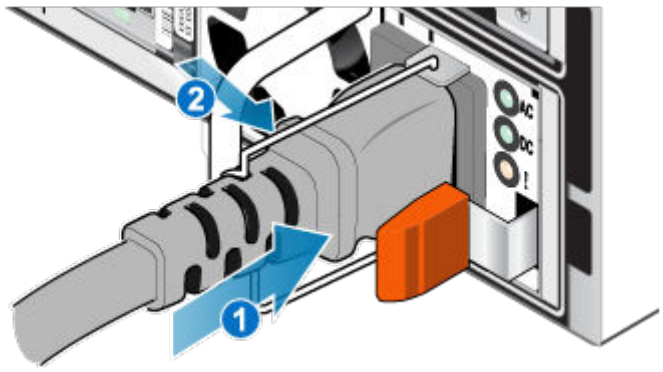


Figure 217. Inserting the power cable

4. Wait until the power supply has powered on and then repeat this process to replace the second power supply.

Start the data-in-place upgrade in PowerStore Manager

Steps

1. From PowerStore Manager, select **Hardware**.
2. Select the checkbox for the appliance that you want to upgrade.
3. Under **More Actions**, select **Data-In-Place Upgrade**.
4. Follow the prompts in PowerStore Manager. The system runs a validation to ensure that the appliance is ready for the upgrade. If all the validation checks pass, the system displays the following message: `The appliance has passed all validation checks and nodes can be upgraded`

   If you did not add the required hardware as described earlier in this procedure, the system displays a failure message:
   - If you are upgrading from a PowerStore 3000 or 3200 to a PowerStore 5200, and the upgrade requires adding NVRAM drives, the system displays the following message: `NVRAM Platform Check running on node_<a or b> has failed: Target platform requires [4] NVRAM drives. Found [x] NVRAM drives..`
   - If you are upgrading to a PowerStore 9200, and the upgrade requires replacing power supplies, the system displays the following message: `Node PSU platform check running on node_<a or b> has failed. Power supplies on [x] are not compatible with the specified platform [y]..`

   NOTE: If you have not already installed the required hardware that came with your data-in-place upgrade, cancel the validation check, install the hardware, and rerun the validation check. If you have already installed the hardware and still cannot pass the validation, contact your service provider.
5. Continue to follow the prompts until you reach the summary page. Click **Finish**. After several minutes, the job status for the hardware upgrade briefly displays in a pop-up window.
6. To monitor the job status, go to **Monitoring** > **Jobs** and click **Hardware Upgrade Command**. You can also access the job status by clicking the Jobs icon at the top of the page.
7. After several minutes, PowerStore Manager may lose connection to the system while it automatically disconnects from the primary node and connects to the peer node. When this process is completed, the system displays the following message: `The connection to the PowerStore has been restored.`
8. After several minutes, a blue informational alert on the alert banner indicates that you should power off node A. Go to the "Power off node A" section while continuing to monitor PowerStore Manager for additional alerts and prompts.

Cancelling the upgrade

If you need to cancel the data-in-place upgrade, this is the last opportunity to do so. You must cancel the upgrade before replacing the source node. Once you insert target node A and it boots successfully, it is not possible to revert back to the original system type. The only exception is if the new target node failed to install. If this occurs, contact your service provider.

Steps

1. If applicable, swap back any power supplies that you replaced or remove NVRAM drives that you added.
2. If you powered down node A, reboot it.
3. If you removed node A, reverse what you have done and reinsert node A. When node A has finished rebooting, the following alert displays:

   ```
   Hardware rollback has completed successfully
   ```

   The Hardware Upgrade Command job under **Monitoring** > **Jobs** will fail.

Power off node A

Power off node A as described in Powering off procedures for PowerStore node. PowerStore Manager briefly loses connection to the system while it automatically disconnects from the primary node and connects to the peer node.

Remove source node A

Take the following actions to remove node A from the chassis. Node A is the bottom node.

Prerequisites

If the cables are not already labeled, label them clearly for reconnecting later.

About this task

CAUTION: Do not remove a node while the "Unsafe to remove" LED is lit. If the LED is lit, the peer node has been powered off or is offline, and this node should not be removed.

CAUTION: Because nodes include cooling fans, they should be removed for as short a time as possible.

Steps

1. Ensure that the wire bail is properly secured to the power supply cable of the other node to prevent accidental loss of power and cache.
2. Rotate the power cable retention bail to the left. Disconnect the power cable from the power supply.

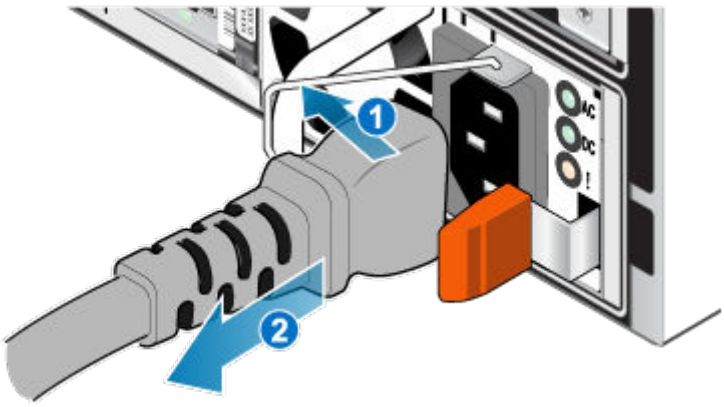


Figure 218. Removing the power cable

3. Disconnect the cables from the back of the I/O modules and network ports on the node.

   NOTE: Do not remove any cables from the other node.

4. Remove the node ID plug from the node handle.
5. Pull the orange release trigger while gently pushing in on the node.

The hook disengages from the locking mechanism, and the release tab slides out.

NOTE: The node comes completely out of the chassis. Be prepared to support the node to avoid dropping it.

NOTE: The release trigger and handle for node A is on the bottom right.

CAUTION: Removing the incorrect node leads to loss of system power and lost cached data.

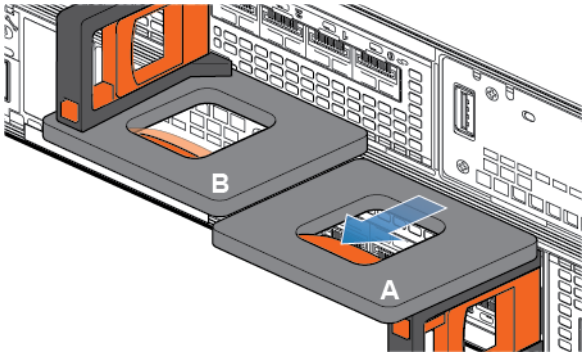


Figure 219. Disengaging the locking mechanism for node A

6. Use the release handle to pull the node outward enough to grasp the sides with both hands. Then, with both hands supporting the node, pull the node fully out of the enclosure.

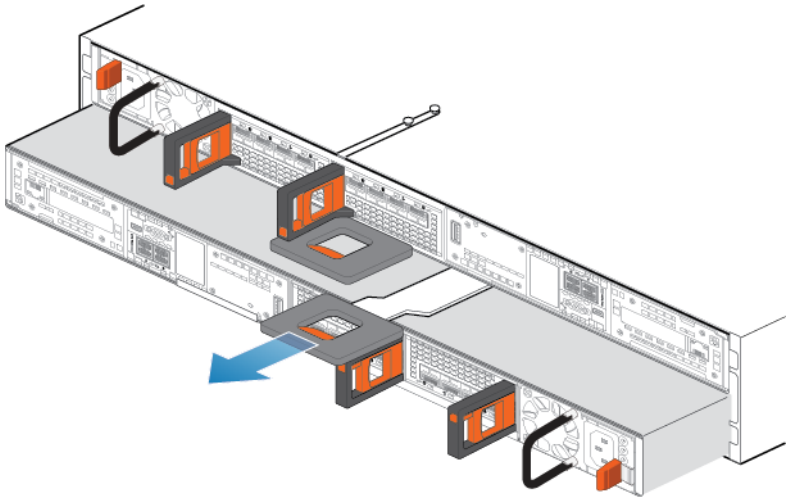


Figure 220. Removing the node

7. Place the node on a clean, flat, static-free work surface with the top cover facing up.

Move components from the source node to the target node

Move the following components from the source node to the target node:

- Power supply
- I/O modules
- Embedded module
- M.2 boot module adaptor
- Internal battery backup module

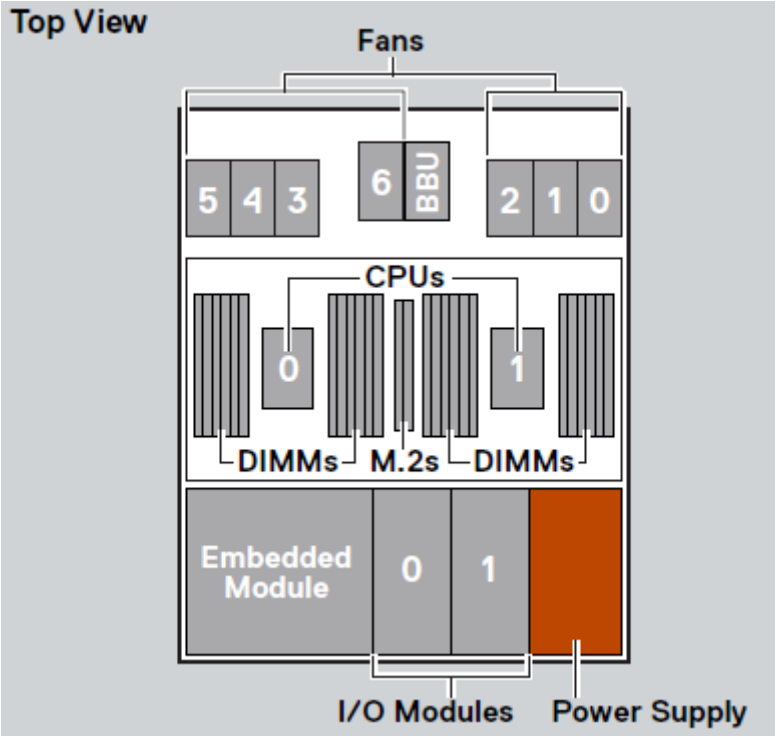


Figure 221. Top view of the node

NOTE: It is not necessary to move the CPUs, DIMMs, or fans. The target node comes with those components already installed.

Move the power supply

Take the following actions to move the power supply from the source node to the target node.

Remove a power supply

Steps

Push and hold the orange release tab and grasp the power supply by its handle. Remove the power supply by pulling it from the node.

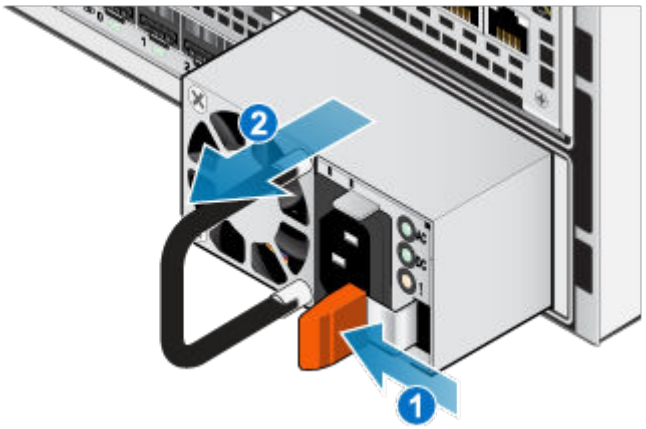


Figure 222. Removing a power supply

Install a power supply

Steps

1. Align the power supply with the slot in the node.
2. Push the power supply into the node until it clicks into place.

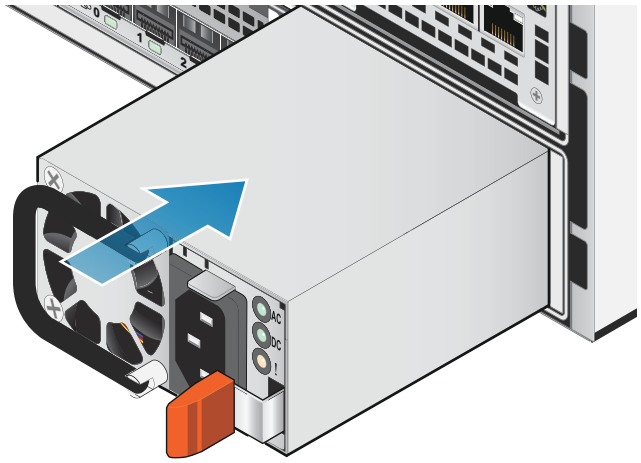


Figure 223. Installing a power supply

Move the I/O modules

Take the following actions to move the I/O modules from the source node to the target node.

Remove an I/O module

About this task

NOTE: Move the I/O modules from the source to the target one at a time. The I/O modules must be moved into the corresponding slots on the target node.

NOTE: The figures below show the I/O module in the top node installed in the rack. The top node is upside down in the rack, so the alignment of the I/O module is reversed when the node is on a work surface.

Steps

1. Pull the trigger mechanism on the I/O module handle to release it.

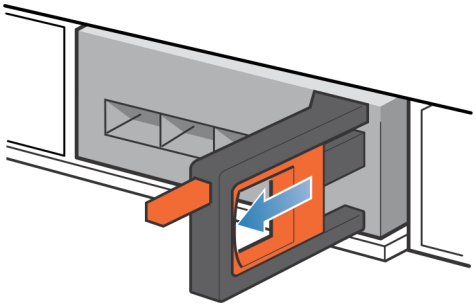


Figure 224. Releasing the I/O module

2. Gently pull the I/O module from the slot.

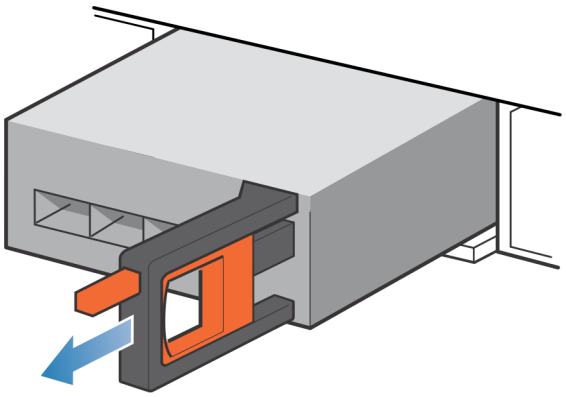


Figure 225. Removing the I/O module

Install an I/O module

About this task

NOTE: Move the I/O modules from the source to the target one at a time. The I/O modules must be moved into the corresponding slots on the target node.

NOTE: The figures below show the I/O module in the top node installed in the rack. The top node is upside down in the rack, so the alignment of the I/O module is reversed when the node is on a work surface.

Steps

1. Align the module with the empty slot and carefully push the module into the slot.

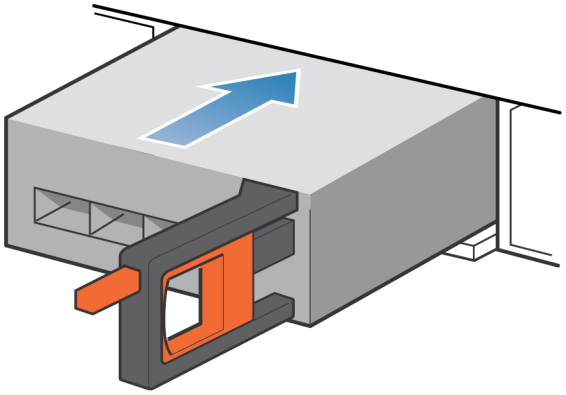


Figure 226. Installing an I/O module

2. When the I/O module appears seated, push and release the small button on the handle.
   - If the button remains in, the module is fully seated.
   - If the button springs back, gently push the module further into the chassis, then push it again.
   - If the button still does not rest flush with its handle, remove the module and repeat steps 1 and 2.

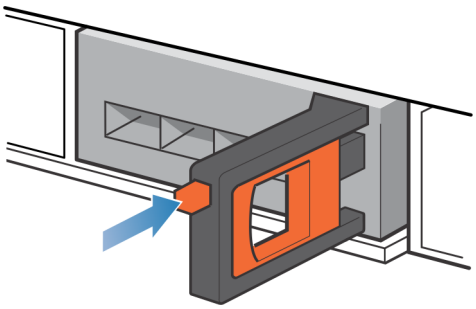


Figure 227. Locking in the I/O module

Move the embedded module

Take the following actions to move the embedded module from the source node to the target node.

Remove the embedded module

About this task

NOTE: The figures below show the embedded module in the top node installed in the rack. The top node is upside down in the rack, so the alignment of the embedded module is reversed when the node is on a work surface.

Steps

1. Push the orange tab on the embedded module to release the lever.

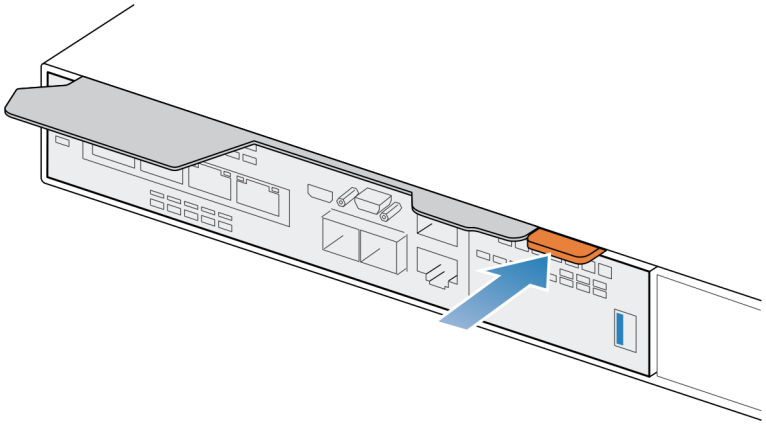


Figure 228. Releasing the lever on the embedded module

2. Pull the release lever away from the system. The embedded module releases from the system as you pull the lever.

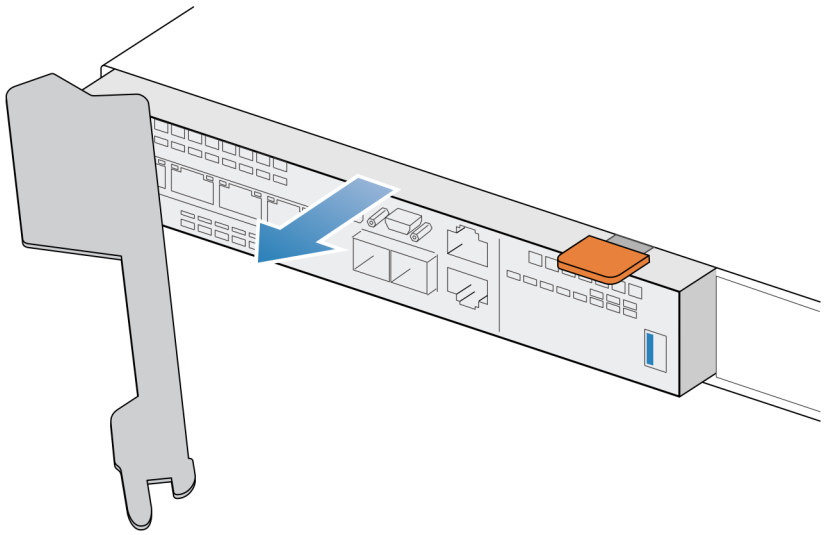


Figure 229. Removing the embedded module from the system

3. Remove the embedded module from the slot.

Install the embedded module

About this task

NOTE: The figures below show the embedded module in the top node installed in the rack. The top node is upside down in the rack, so the alignment of the embedded module is reversed when the node is on a work surface.

Steps

1. Align the embedded module with the empty slot and carefully push it into the slot.

   As the embedded module is installed, the release lever rotates inward.

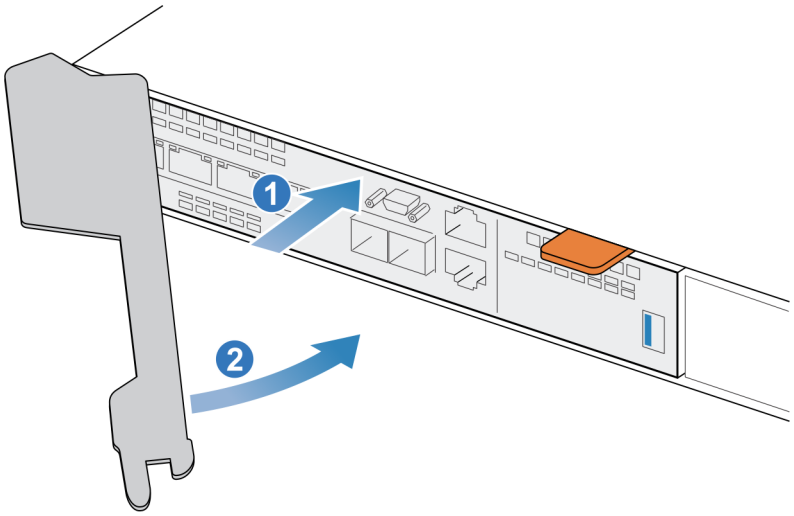


Figure 230. Installing the embedded module

2. When the embedded module is fully seated, push the release lever back into the system until the orange tab locks the lever in place.

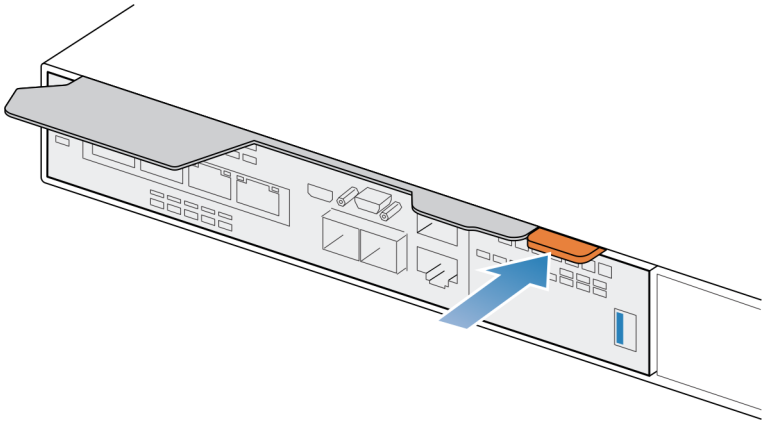


Figure 231. Locking the release lever

Remove the top cover from the node

Steps

1. While pushing down the two blue release buttons, slide the top cover towards the rear of the system, until it stops.

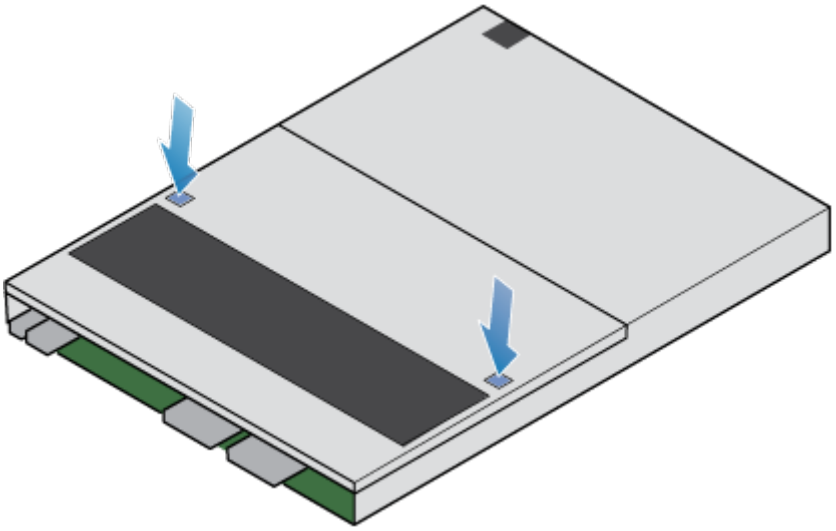


Figure 232. Releasing the top cover

2. Lift the top cover upward, and remove it from the node.

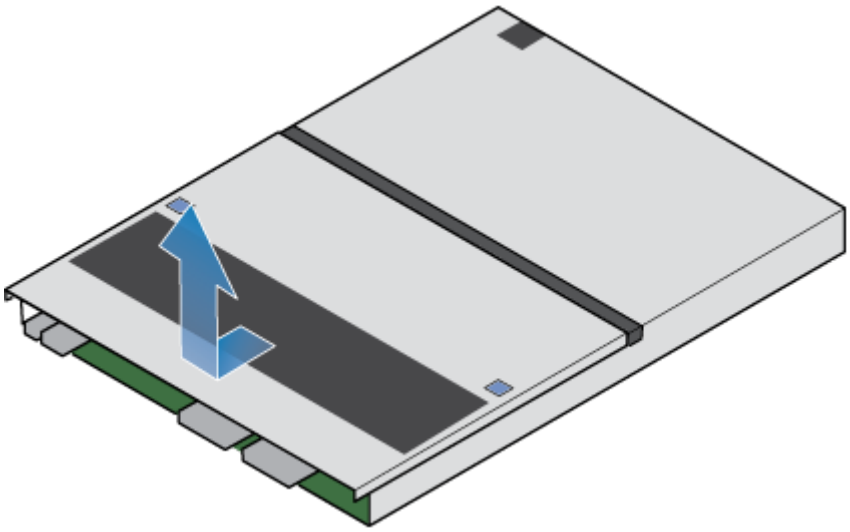


Figure 233. Removing the top cover

Move the M.2 boot module adaptor

Take the following actions to move the M.2 boot module adaptor from the source node to the target node.

Remove the M.2 boot module adaptor from the target node

Steps

1. Locate the M.2 boot module adaptor in the node.
   You can identify the M.2 boot module adaptor by the blue retaining tabs.
2. Press the blue retaining tabs downward to free the M.2 boot module adaptor from its slot.
3. Touching only the outside edges of the M.2 boot module adaptor, remove the M.2 boot module adaptor.

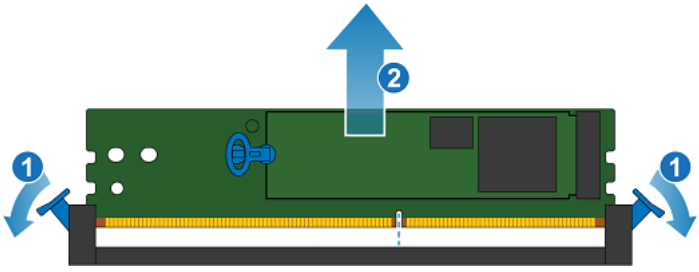


Figure 234. Removing the M.2 boot module adaptor

NOTE: The figure above shows an M.2 boot module adaptor with M.2 drives installed. The M.2 boot module adaptor on the target node does not include M.2 drives.

Remove the M.2 boot module adaptor from the source node

Steps

1. Locate the M.2 boot module adaptor in the node.
   You can identify the M.2 boot module adaptor by the blue retaining tabs.
2. Press the blue retaining tabs downward to free the M.2 boot module adaptor from its slot.

3. Touching only the outside edges of the M.2 boot module adaptor, remove the M.2 boot module adaptor.

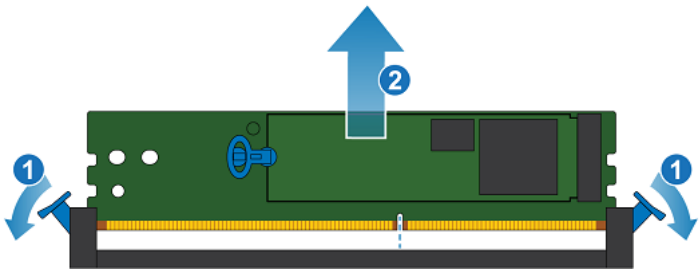


Figure 235. Removing the M.2 boot module adaptor

Install the M.2 boot module adaptor

Steps

1. Touching only the outside edges of the M.2 boot module adaptor, align the M.2 boot module adaptor with the connector.
2. Firmly push the M.2 boot module adaptor straight down into the connector.
   When the M.2 boot module adaptor is fully seated, you will hear a snap, and feel the connector latches click into place.

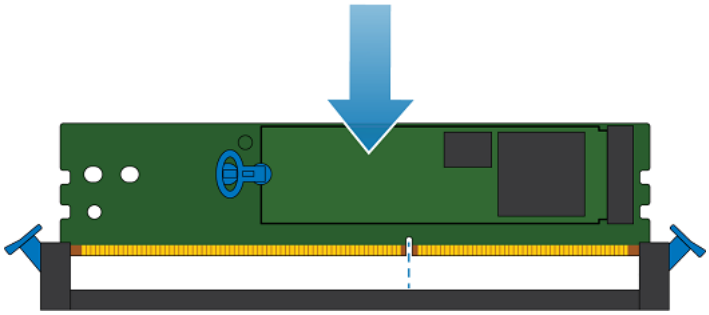


Figure 236. Installing the M.2 boot module adaptor

Move the internal battery backup module

Take the following actions to move the internal battery backup module from the source node to the target node.

Remove the internal battery backup module

Steps

1. Lift the gray padding away from the internal battery backup module.
2. Remove the clip around the internal battery backup module by pulling the tab on the left side.
3. Disconnect the internal battery backup module cable from the motherboard.

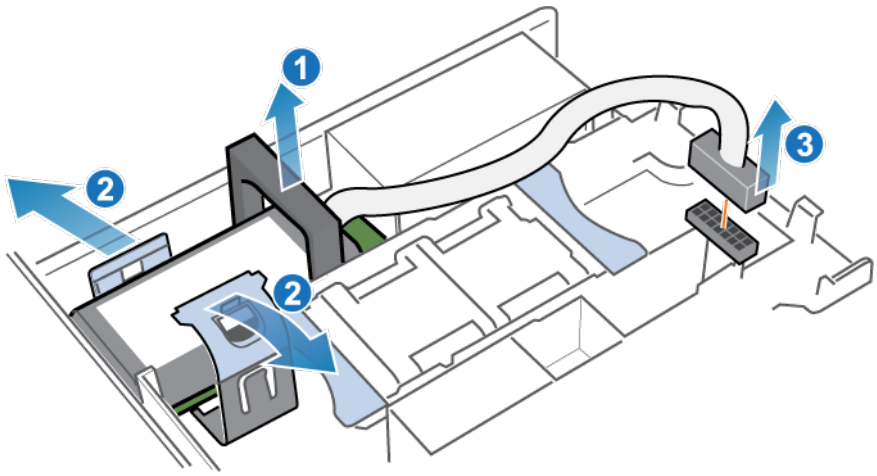


Figure 237. Releasing the internal battery backup module

4. Lift the internal battery backup module away from the motherboard.

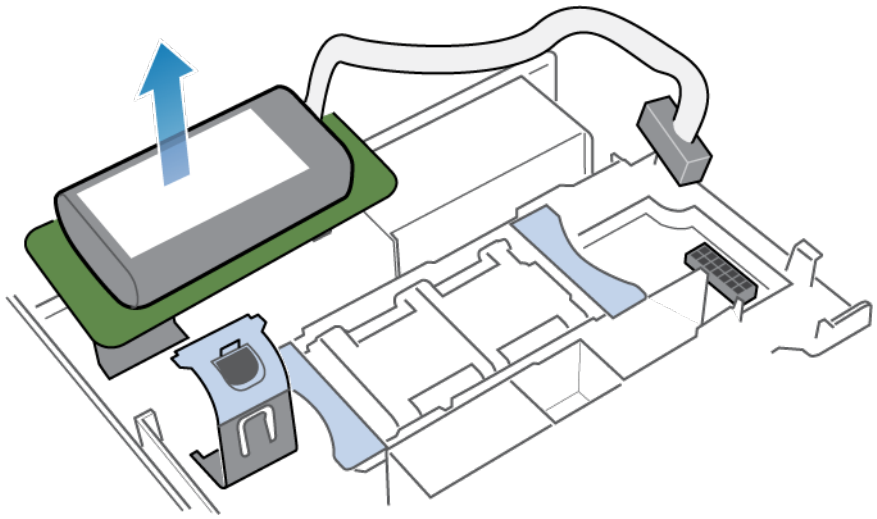


Figure 238. Removing the internal battery backup module from the motherboard

Install the internal battery backup module

Steps

1. Remove the gray padding from the internal battery backup module slot.
2. Place the internal battery backup module into position on the motherboard.

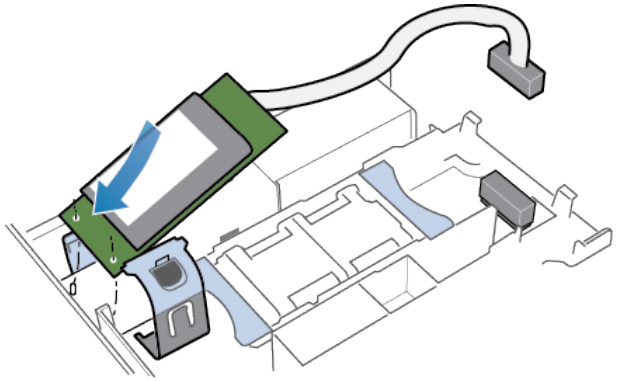


Figure 239. Positioning the internal battery backup module

3. Close the clip around the center of the internal battery backup module until it clicks into place.
4. Replace the gray padding around the top of the internal battery backup module.
5. Connect the internal battery backup module cable to the motherboard.

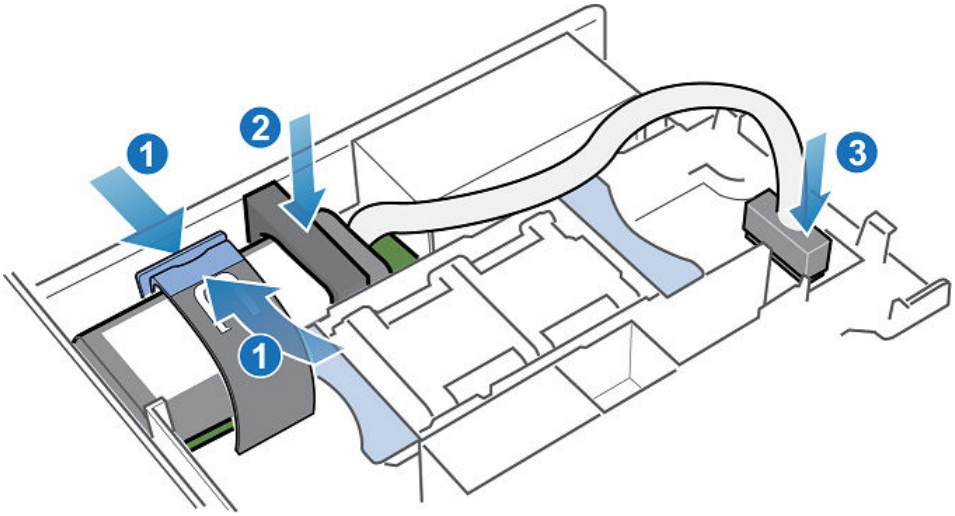


Figure 240. Connecting the internal battery backup module cable to the motherboard

6. Verify that internal battery backup module cable is properly routed through the cable retainer clips.

Install the top cover on the node

Steps

1. Position the top cover over the node and align it with the slots on the sides at the rear of the node.

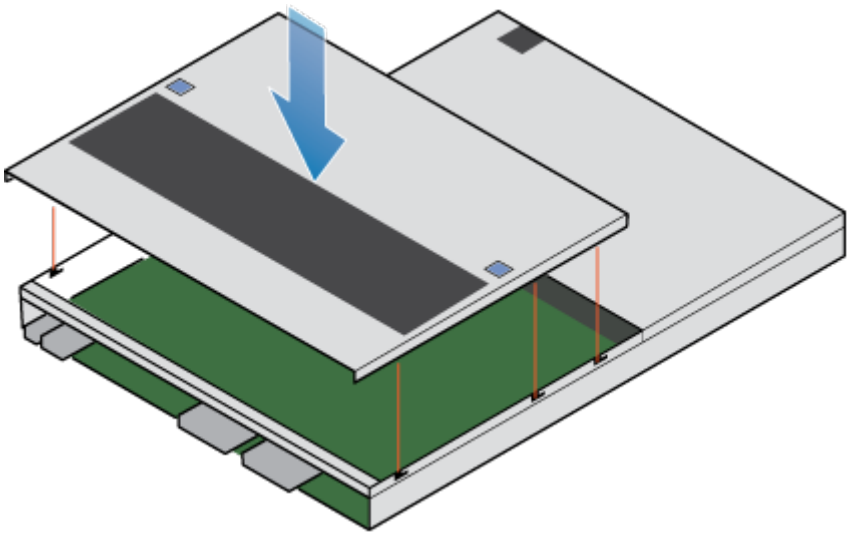


Figure 241. Aligning the top cover

2. Pull the top cover forward to secure it in place.

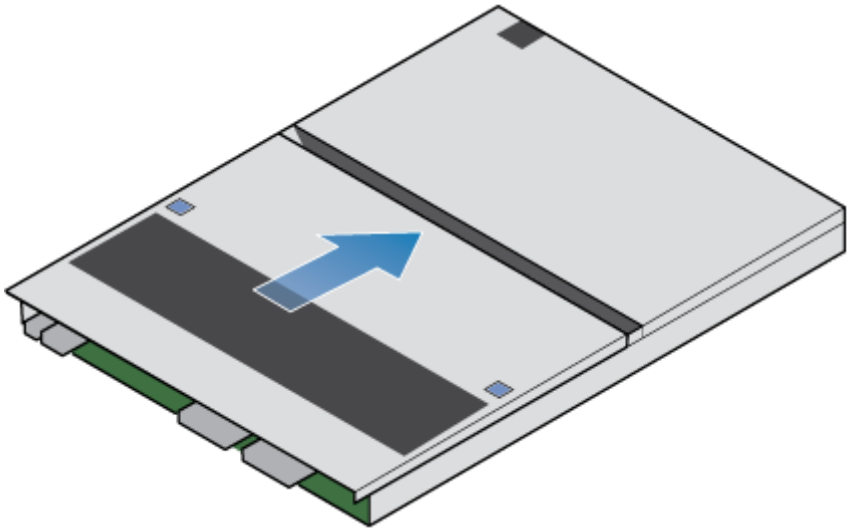


Figure 242. Securing the top cover

Install the node

Steps

1. Align the node with the opening on the chassis.
2. Slide the node into the chassis until it stops, about halfway in.

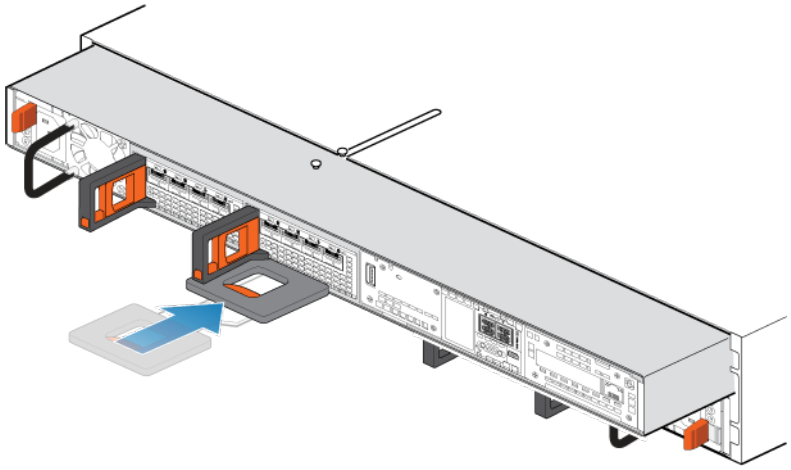


Figure 243. Sliding the node halfway into the chassis

3. Pull the black release tab out completely, and slide the rest of the node back into the chassis.
   The black release tab slides back into the system as it is inserted.

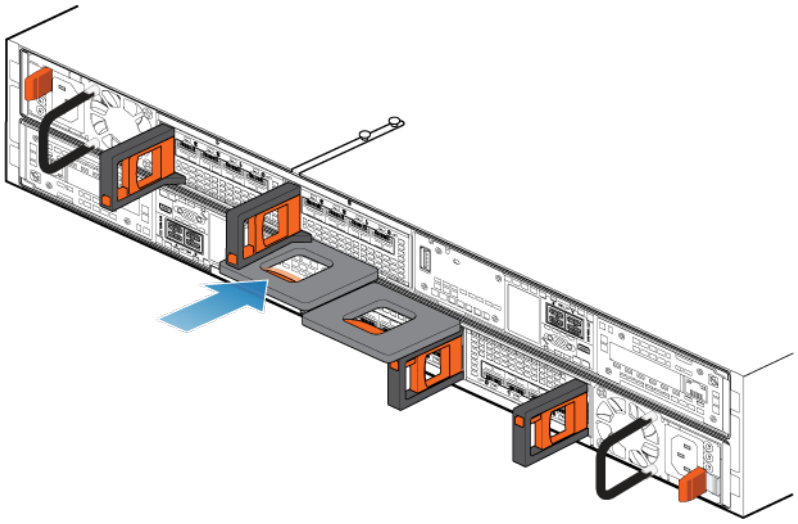


Figure 244. Installing the node

4. Pull the orange release trigger and push in gently to reengage the locking mechanism.
   If the black release tab comes out when pulled, the locking mechanism is not engaged.

   CAUTION: Verify that all the components are fully seated and correctly locked in place.

5. Reconnect the back-end cables and the cables to the I/O modules and network ports.
6. Push the node ID plug onto the node handle.
7. Plug in the power cable immediately after installing the node.

   CAUTION: Failure to plug in the power cable could prevent required firmware upgrades from completing.

Wait for node A to pass health checks

About this task

When node A goes online, the system performs firmware upgrades, runs a series of health checks, and confirms that the installed hardware is correct. This process may take up to one hour.

Steps

1. In PowerStore Manager, wait until the system completes the health checks and displays the following alert on the alert banner:

```
Follow the instructions in the Power control procedures appendix of the PowerStore
Installation and Service Guide to power off Node B...
```

2. If the health checks fail, the system displays the following message:

```
Appliance is not ready to upgrade the second node. The system is verifying the health
of the appliance to determine when it is safe to continue the upgrade.
```

3. Resolve any issues that the health checks identify before moving onto node B.
4. If the process has not completed after one hour, run the following command to check the status of the job:
   `svc_health_check run -p After_First_Node_Dip_Online -ep health_check_type=0 -v`
5. If you are unable to resolve any of the issues, contact your service provider.

Power off node B

Power off node B as described in Powering off procedures for PowerStore node.

Remove source node B

Take the following actions to remove node B from the chassis. Node B is the top node.

Prerequisites

If the cables are not already labeled, label them clearly for reconnecting later.

About this task

CAUTION: Do not remove a node while the "Unsafe to remove" LED is lit. If the LED is lit, the peer node has been powered off or is offline, and this node should not be removed.

CAUTION: Because nodes include cooling fans, they should be removed for as short a time as possible.

Steps

1. Ensure that the wire bail is properly secured to the power supply cable of the other node to prevent accidental loss of power and cache.
2. Rotate the power cable retention bail to the right. Disconnect the power cable from the power supply.
3. Disconnect the cables from the back of the I/O modules and network ports on the node.

   NOTE: Do not remove any cables from the other node.

4. Remove the node ID plug from the node handle.
5. Pull the orange release trigger while gently pushing in on the node.

   The hook disengages from the locking mechanism, and the release tab slides out.

   NOTE: The node comes completely out of the chassis. Be prepared to support the node to avoid dropping it.

   NOTE: The release trigger and handle for node B is on the upper left.

   CAUTION: Removing the incorrect node leads to loss of system power and lost cached data.

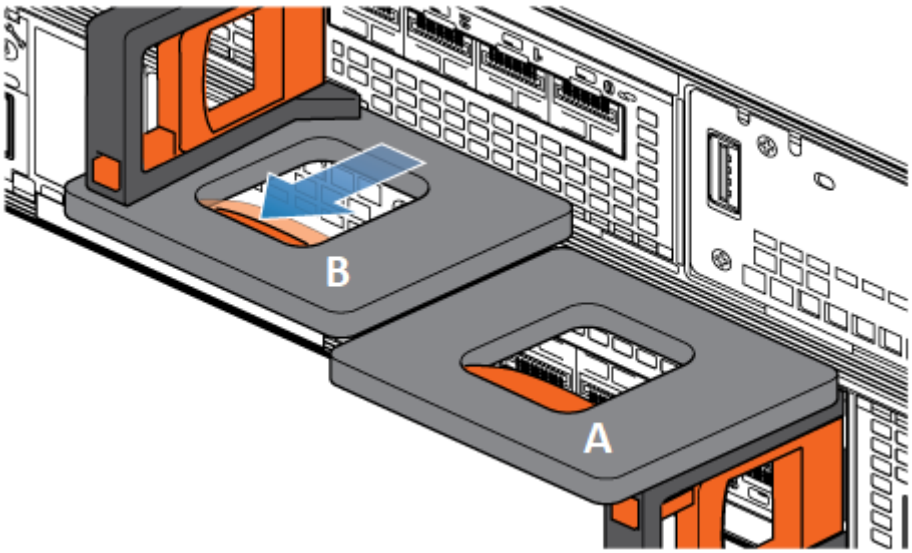


Figure 245. Disengaging the locking mechanism for node B

6. Use the release handle to pull the node outward enough to grasp the sides with both hands. Then, with both hands supporting the node, pull the node fully out of the enclosure.

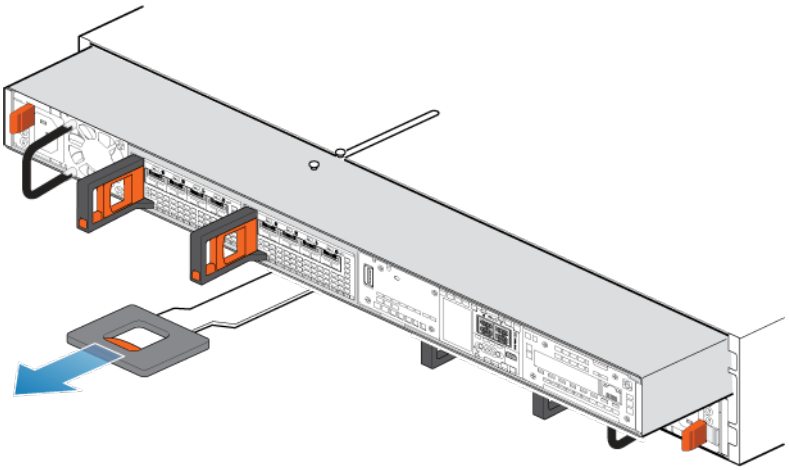


Figure 246. Removing the node

7. Place the node on a clean, flat, static-free work surface with the top cover facing up.

Move components from the source node to the target node

Move the following components from the source node to the target node:

- Power supply
- I/O modules
- Embedded module
- M.2 boot module adaptor
- Internal battery backup module

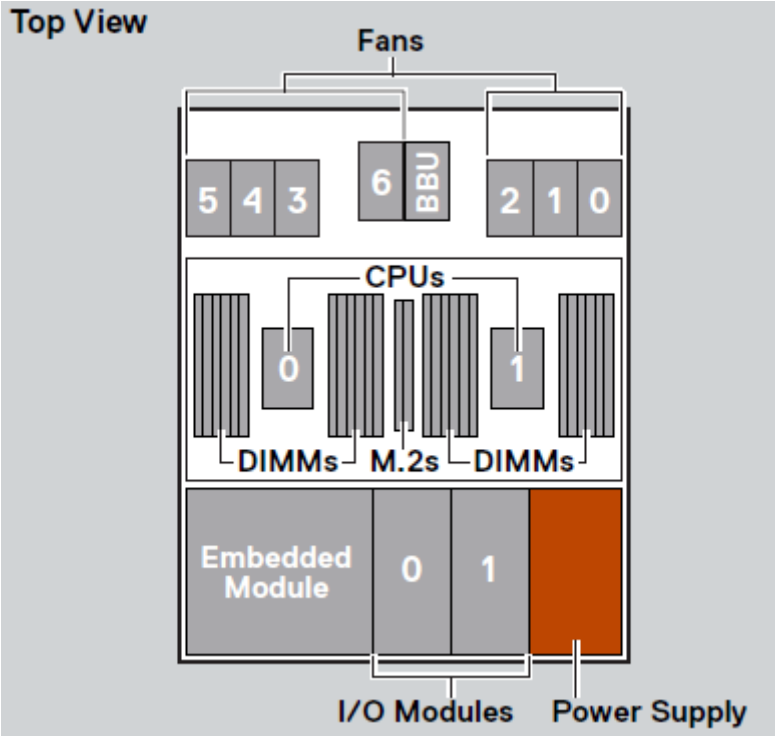


Figure 247. Top view of the node

NOTE: It is not necessary to move the CPUs, DIMMs, or fans. The target node comes with those components already installed.

Move the power supply

Take the following actions to move the power supply from the source node to the target node.

Remove a power supply

Steps

Push and hold the orange release tab and grasp the power supply by its handle. Remove the power supply by pulling it from the node.

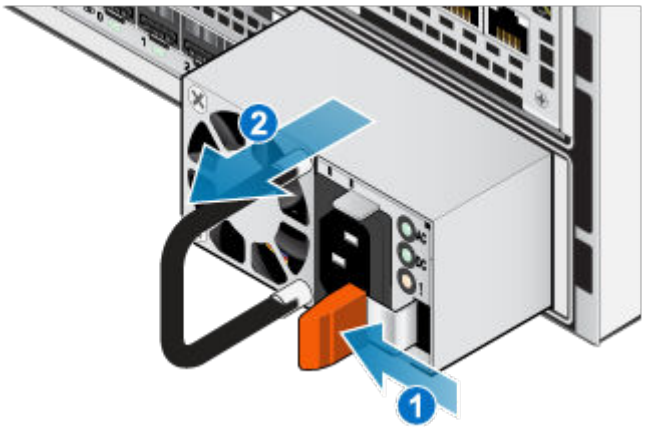


Figure 248. Removing a power supply

Install a power supply

Steps

1. Align the power supply with the slot in the node.
2. Push the power supply into the node until it clicks into place.

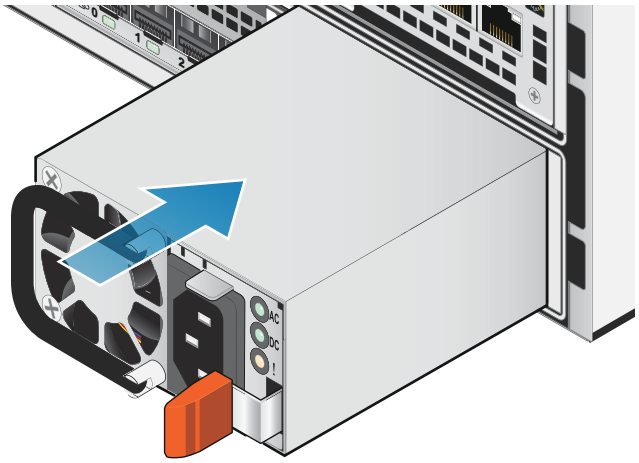


Figure 249. Installing a power supply

Move the I/O modules

Take the following actions to move the I/O modules from the source node to the target node.

Remove an I/O module

About this task

NOTE: Move the I/O modules from the source to the target one at a time. The I/O modules must be moved into the corresponding slots on the target node.

NOTE: The figures below show the I/O module in the top node installed in the rack. The top node is upside down in the rack, so the alignment of the I/O module is reversed when the node is on a work surface.

Steps

1. Pull the trigger mechanism on the I/O module handle to release it.

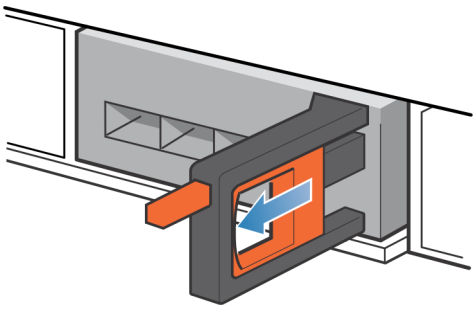


Figure 250. Releasing the I/O module

2. Gently pull the I/O module from the slot.

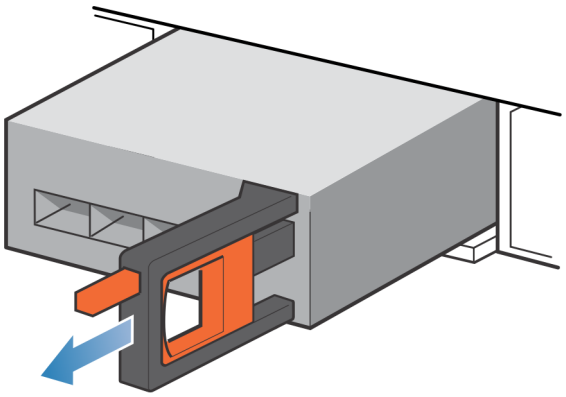


Figure 251. Removing the I/O module

Install an I/O module

About this task

NOTE: Move the I/O modules from the source to the target one at a time. The I/O modules must be moved into the corresponding slots on the target node.

NOTE: The figures below show the I/O module in the top node installed in the rack. The top node is upside down in the rack, so the alignment of the I/O module is reversed when the node is on a work surface.

Steps

1. Align the module with the empty slot and carefully push the module into the slot.

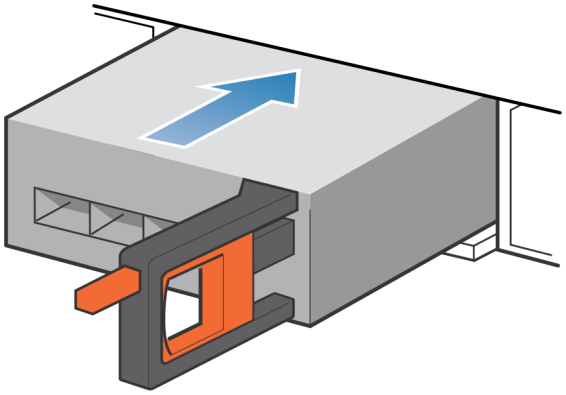


Figure 252. Installing an I/O module

2. When the I/O module appears seated, push and release the small button on the handle.
   - If the button remains in, the module is fully seated.
   - If the button springs back, gently push the module further into the chassis, then push it again.
   - If the button still does not rest flush with its handle, remove the module and repeat steps 1 and 2.

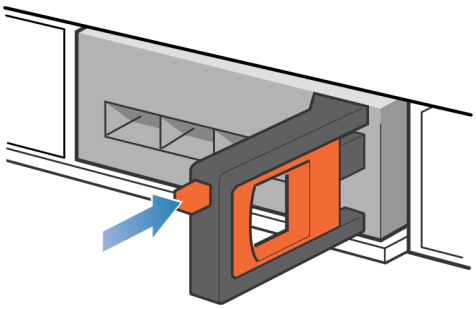


Figure 253. Locking in the I/O module

Move the embedded module

Take the following actions to move the embedded module from the source node to the target node.

Remove the embedded module

About this task

NOTE: The figures below show the embedded module in the top node installed in the rack. The top node is upside down in the rack, so the alignment of the embedded module is reversed when the node is on a work surface.

Steps

1. Push the orange tab on the embedded module to release the lever.

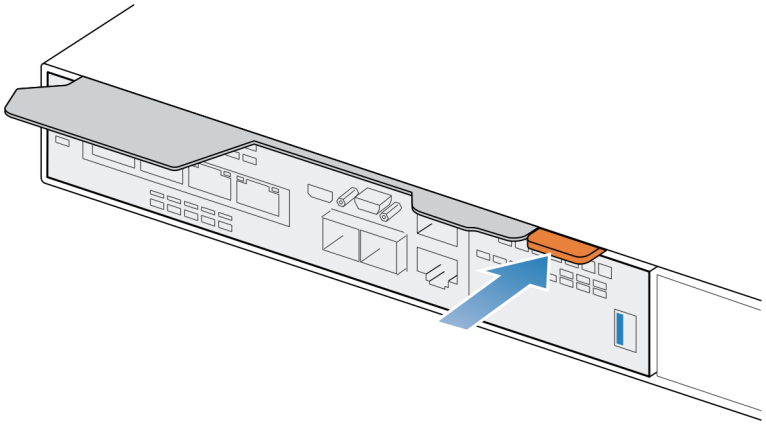


Figure 254. Releasing the lever on the embedded module

2. Pull the release lever away from the system. The embedded module releases from the system as you pull the lever.

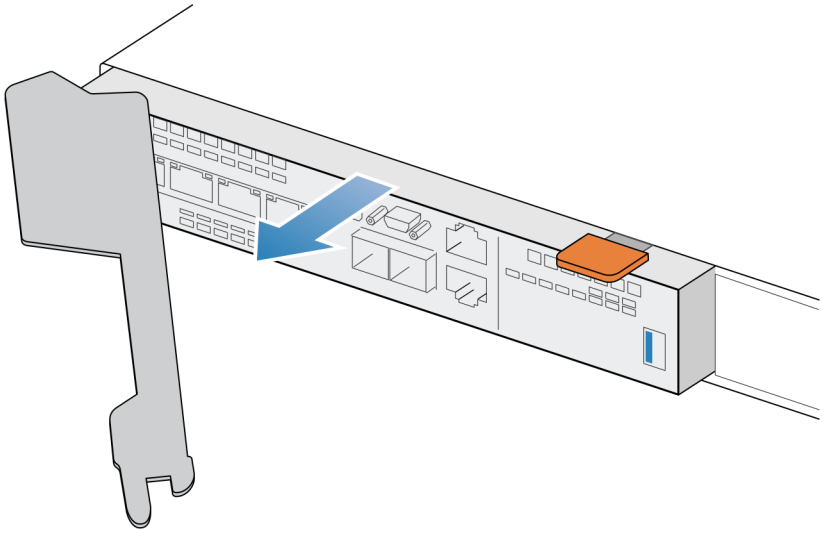


Figure 255. Removing the embedded module from the system

3. Remove the embedded module from the slot.

Install the embedded module

About this task

NOTE: The figures below show the embedded module in the top node installed in the rack. The top node is upside down in the rack, so the alignment of the embedded module is reversed when the node is on a work surface.

Steps

1. Align the embedded module with the empty slot and carefully push it into the slot.

   As the embedded module is installed, the release lever rotates inward.

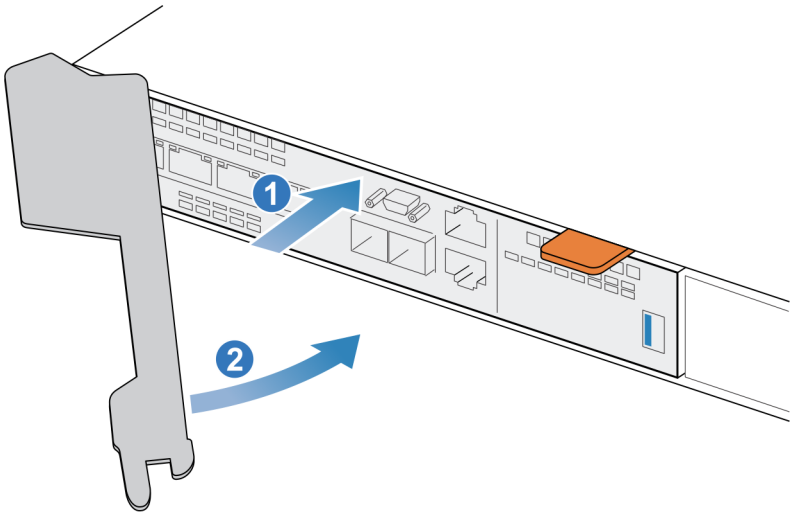


Figure 256. Installing the embedded module

2. When the embedded module is fully seated, push the release lever back into the system until the orange tab locks the lever in place.

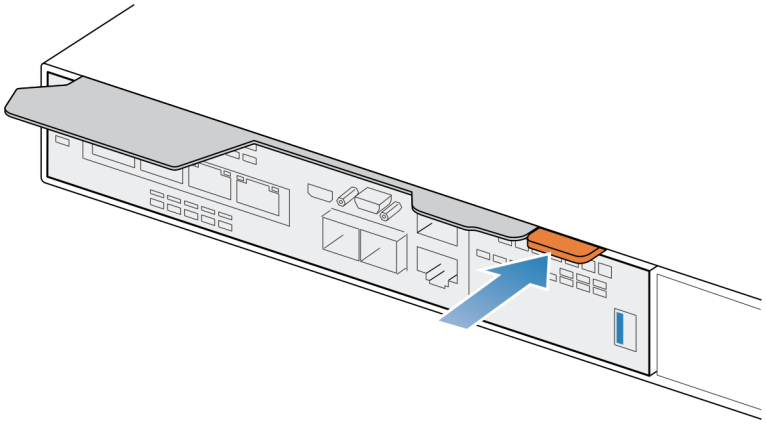


Figure 257. Locking the release lever

Remove the top cover from the node

Steps

1. While pushing down the two blue release buttons, slide the top cover towards the rear of the system, until it stops.

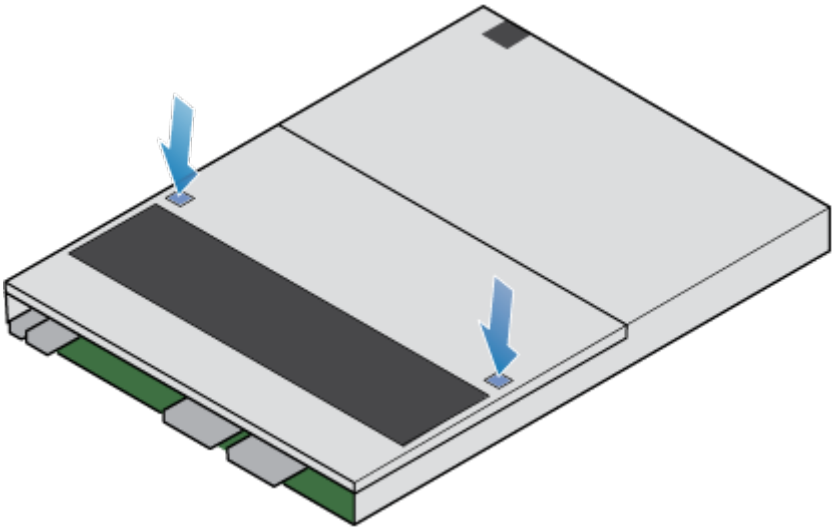


Figure 258. Releasing the top cover

2. Lift the top cover upward, and remove it from the node.

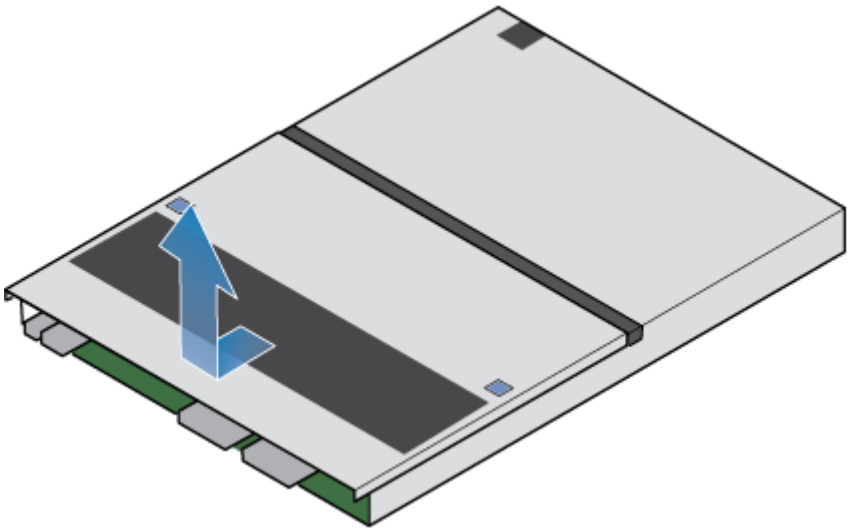


Figure 259. Removing the top cover

Move the M.2 boot module adaptor

Take the following actions to move the M.2 boot module adaptor from the source node to the target node.

Remove the M.2 boot module adaptor from the target node

Steps

1. Locate the M.2 boot module adaptor in the node.
   You can identify the M.2 boot module adaptor by the blue retaining tabs.
2. Press the blue retaining tabs downward to free the M.2 boot module adaptor from its slot.
3. Touching only the outside edges of the M.2 boot module adaptor, remove the M.2 boot module adaptor.

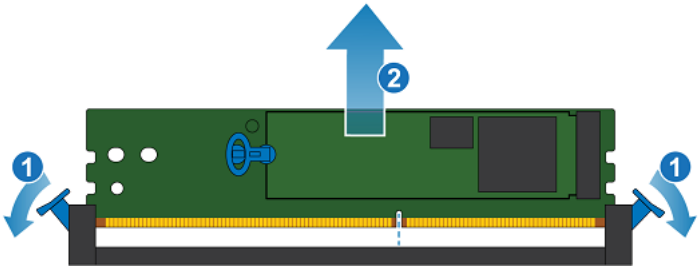


Figure 260. Removing the M.2 boot module adaptor

NOTE: The figure above shows an M.2 boot module adaptor with M.2 drives installed. The M.2 boot module adaptor on the target node does not include M.2 drives.

Remove the M.2 boot module adaptor from the source node

Steps

1. Locate the M.2 boot module adaptor in the node.
   You can identify the M.2 boot module adaptor by the blue retaining tabs.
2. Press the blue retaining tabs downward to free the M.2 boot module adaptor from its slot.

3. Touching only the outside edges of the M.2 boot module adaptor, remove the M.2 boot module adaptor.

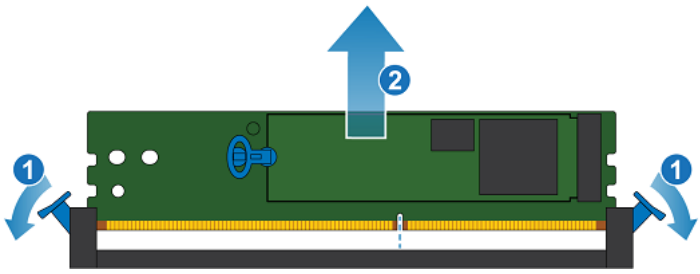


Figure 261. Removing the M.2 boot module adaptor

Install the M.2 boot module adaptor

Steps

1. Touching only the outside edges of the M.2 boot module adaptor, align the M.2 boot module adaptor with the connector.
2. Firmly push the M.2 boot module adaptor straight down into the connector.
   When the M.2 boot module adaptor is fully seated, you will hear a snap, and feel the connector latches click into place.

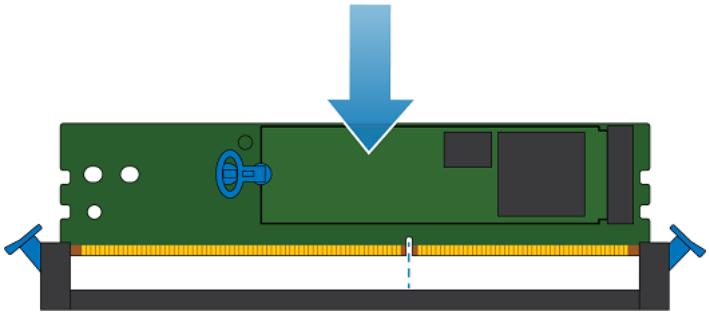


Figure 262. Installing the M.2 boot module adaptor

Move the internal battery backup module

Take the following actions to move the internal battery backup module from the source node to the target node.

Remove the internal battery backup module

Steps

1. Lift the gray padding away from the internal battery backup module.
2. Remove the clip around the internal battery backup module by pulling the tab on the left side.
3. Disconnect the internal battery backup module cable from the motherboard.

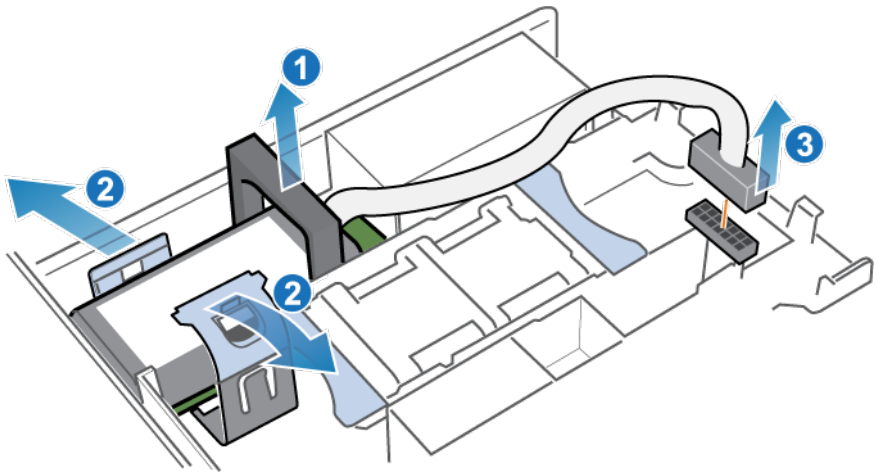


Figure 263. Releasing the internal battery backup module

4. Lift the internal battery backup module away from the motherboard.

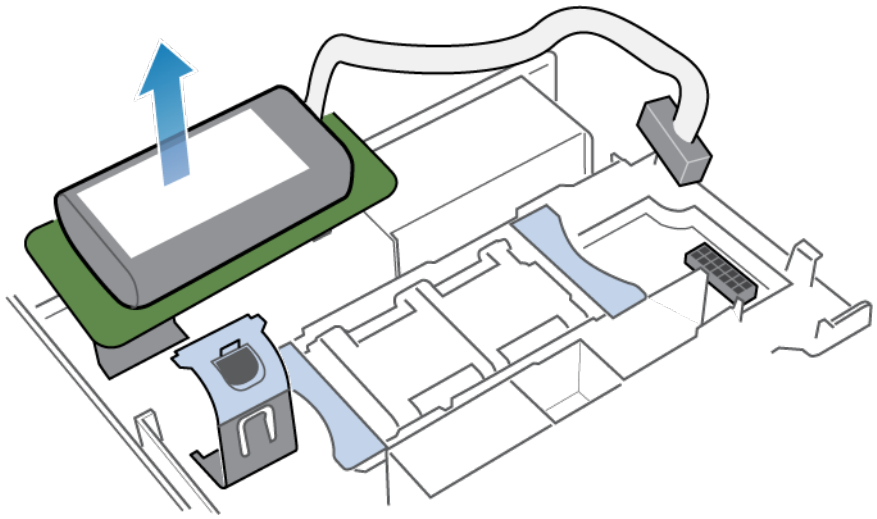


Figure 264. Removing the internal battery backup module from the motherboard

Install the internal battery backup module

Steps

1. Remove the gray padding from the internal battery backup module slot.
2. Place the internal battery backup module into position on the motherboard.

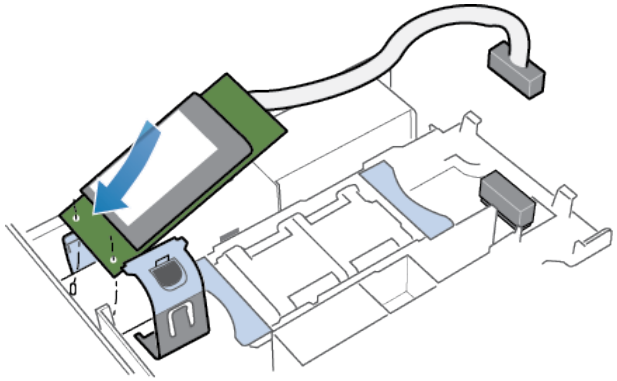


Figure 265. Positioning the internal battery backup module

3. Close the clip around the center of the internal battery backup module until it clicks into place.
4. Replace the gray padding around the top of the internal battery backup module.
5. Connect the internal battery backup module cable to the motherboard.

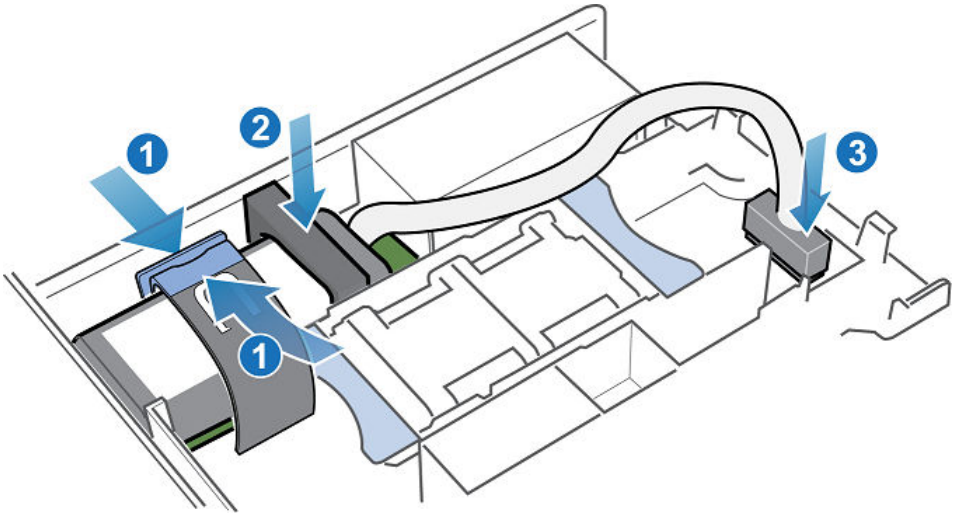


Figure 266. Connecting the internal battery backup module cable to the motherboard

6. Verify that internal battery backup module cable is properly routed through the cable retainer clips.

Install the top cover on the node

Steps

1. Position the top cover over the node and align it with the slots on the sides at the rear of the node.

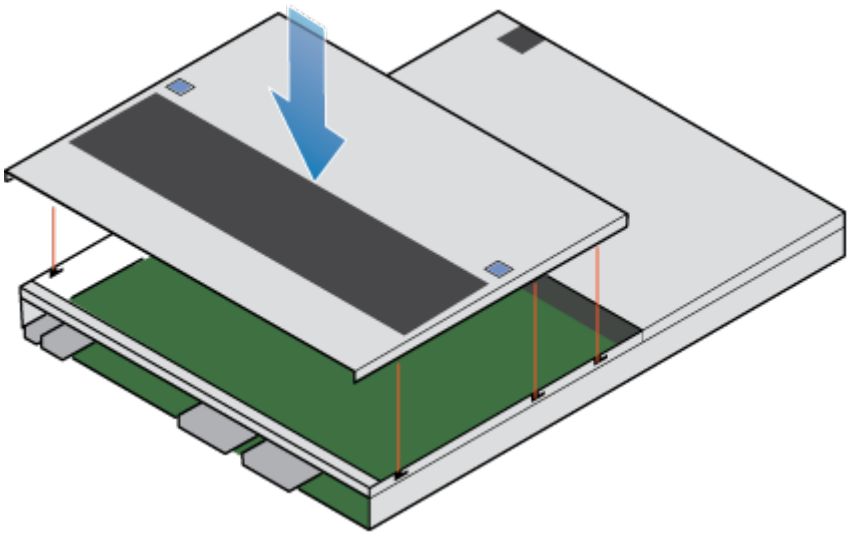


Figure 267. Aligning the top cover

2. Pull the top cover forward to secure it in place.

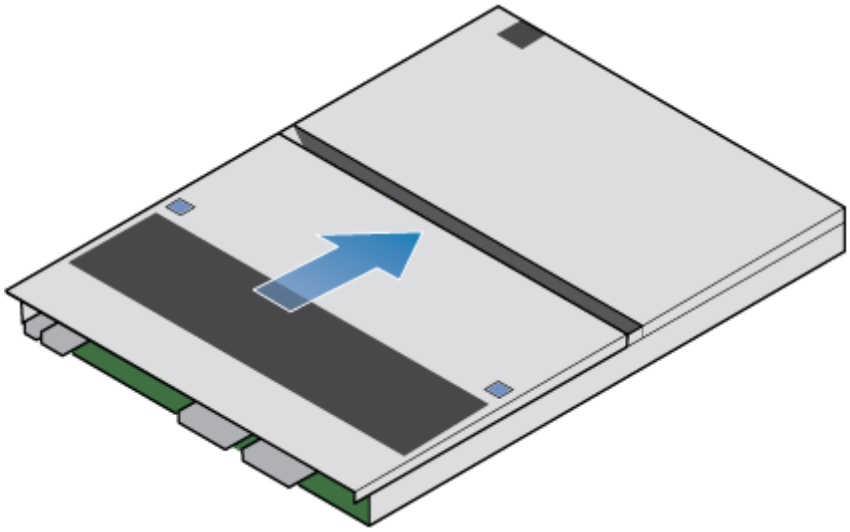


Figure 268. Securing the top cover

3. Flip the node so that the top cover is on the bottom.

Install the node

Steps

1. Align the node with the opening on the chassis.
2. Slide the node into the chassis until it stops, about halfway in.

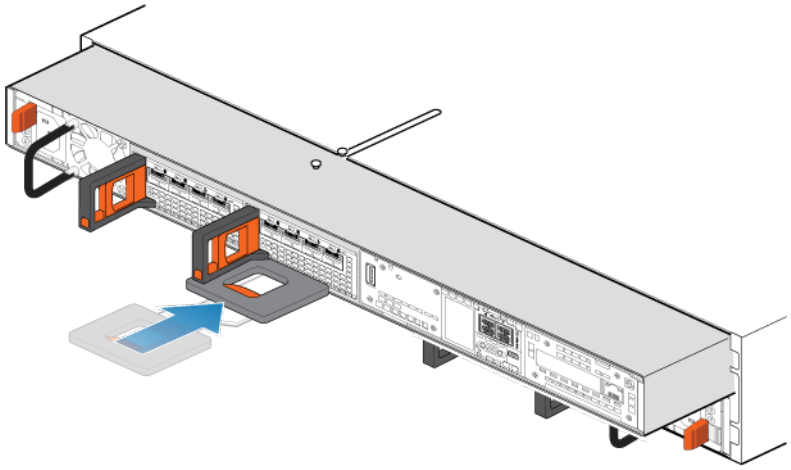


Figure 269. Sliding the node halfway into the chassis

3. Pull the black release tab out completely, and slide the rest of the node back into the chassis.
   The black release tab slides back into the system as it is inserted.

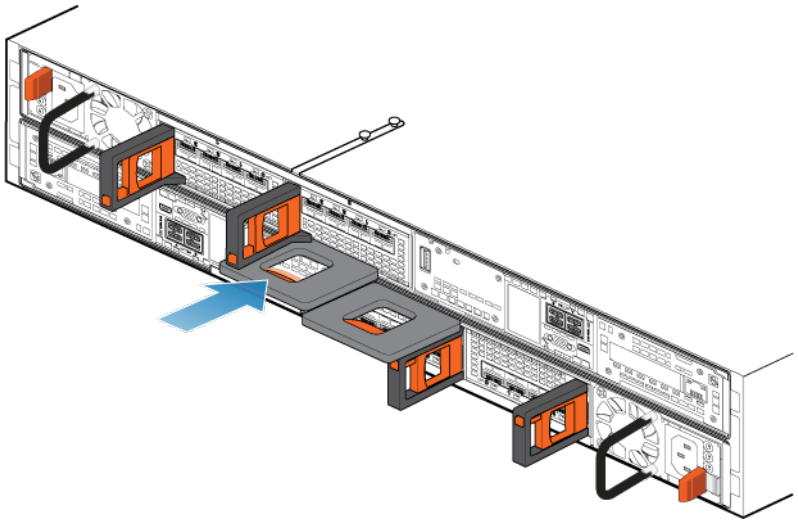


Figure 270. Installing the node

4. Pull the orange release trigger and push in gently to reengage the locking mechanism.
   If the black release tab comes out when pulled, the locking mechanism is not engaged.

   CAUTION: Verify that all the components are fully seated and correctly locked in place.

5. Reconnect the back-end cables and the cables to the I/O modules and network ports.
6. Push the node ID plug onto the node handle.
7. Plug in the power cable immediately after installing the node.

   CAUTION: Failure to plug in the power cable could prevent required firmware upgrades from completing.

Wait for node B to pass health checks

About this task

When node B goes online, the system performs firmware upgrades, runs a series of health checks, and confirms that the installed hardware is correct.

Steps

1. In PowerStore Manager, wait until the system completes the health checks and displays an alert on the alert banner. This process may take up to one hour.
2. After completing the health checks, PowerStore Manager briefly loses connection to the system while it updates the model information. When this process is completed, the system displays the following message:
   `The connection to the PowerStore has been restored.`
3. When the upgrade is complete, the Hardware Upgrade Command job shows as complete in the Job Details, and the system displays the following informational alert:

   ```
   Hardware upgrade appliance status. (complete)
   Hardware upgrade on the appliance has completed
   ```

   PowerStore Manager now displays the upgraded model number for this appliance on the **Hardware** tab.

Replace the black pull tag

Steps

1. Remove the black pull tag from the base enclosure. The black pull tag is on the right side of the front of the base enclosure between drives 16 and 17.

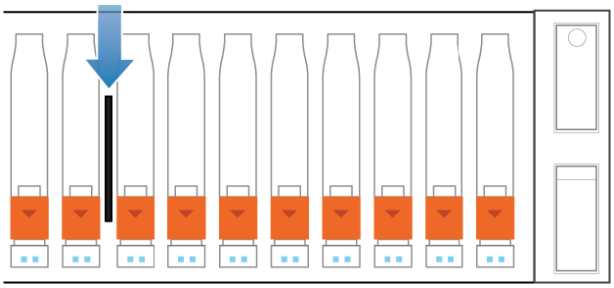


Figure 271. Black pull tag location

CAUTION: Do not remove drives while the system is running.

NOTE: Two rear tabs on the tag secure it in the base enclosure. If you find it difficult to remove the tag, you may need to remove drives and pinch the rear of the tag together to remove it. If you cannot remove the tag without removing drives, you must wait for a scheduled downtime before removing the drives and the tag.

2. Insert the new black pull tag into the base enclosure.

NOTE: The new tag does not include the Dell Service Tag (DST) number. You can find the DST number on the blue pull tag that is located between the drives in slots 7 and 8.

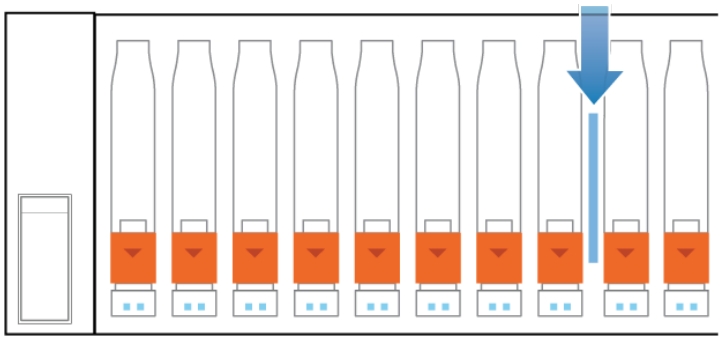


Figure 272. Blue pull tag location

Update Global Asset Management records

After completing the upgrade, contact your service provider to update the Global Asset Management records with details about your upgraded system. Updating the records ensures that you continue to receive the correct support for your system.

NOTE: Dell Service Providers, see KB 000218134: Update PowerStore Global Asset Management (GAM) records to note the new array type after data in place conversion. This KB provides details on how to update GAM with the new array information.

A

Safety precautions for handling replaceable units

Review these safety considerations before replacing any parts to avoid damage to your system.

Topics:

Handling replaceable units

This section describes the precautions that you must take and the general procedures that you must follow when removing, installing, and storing any replaceable unit.

Avoid electrostatic discharge (ESD) damage

When replacing or installing hardware units, you can inadvertently damage the sensitive electronic circuits in the equipment by simply touching them.

Electrostatic charge that has accumulated on your body discharges through the circuits. If the air in the work area is very dry, run a humidifier in the work area to help decrease the risk of ESD damage.

Follow these procedures to prevent equipment damage:

- Provide enough room to work on the equipment.
- Clear the work site of any unnecessary materials or materials that naturally build up electrostatic charge, such as foam packaging, foam cups, cellophane wrappers, and similar items.
- Do not remove replacement or upgrade units from their antistatic packaging until you are ready to install them.
- Before you begin service, gather the ESD kit and all other materials you need.
- Once servicing begins, avoid moving away from the work site; otherwise, you may build up an electrostatic charge.
- Use ESD anti-static gloves or an ESD wristband (with strap). If using an ESD wristband with a strap:
  - Attach the clip of the ESD wristband to the ESD bracket or bare metal on a cabinet or rack or enclosure.
  - Wrap the ESD wristband around your wrist with the metal button against your skin.
  - If a tester is available, test the wristband.
- If an emergency arises and the ESD kit is not available, follow the procedures in Emergency Procedures (without an ESD kit).

Emergency procedures (without an electrostatic discharge kit)

In an emergency when an electrostatic discharge (ESD) kit is not available, use the following precautions to reduce the possibility of an electrostatic discharge. Ensure that your body and the subassembly are at the same electrostatic potential.

NOTE: These precautions are not a substitute for the use of an ESD kit. Follow them only in an emergency.

- Before touching any unit, touch a bare (unpainted) metal surface of the cabinet, rack, or enclosure.
- Before removing any unit from its anti-static bag, place one hand firmly on a bare metal surface of the cabinet, rack or enclosure, and simultaneously, pick up the unit while it is still sealed in the anti-static bag. Simultaneously, do not move around the room or touch other furnishings, personnel, or surfaces until you have installed the unit.
- When you remove a unit from the anti-static bag, avoid touching any electronic components and circuits on it.
- If you must move around the room or touch other surfaces before installing a unit, first place the unit back in the anti-static bag. When you are ready again to install the unit, repeat these procedures.

Hardware acclimation times

Units must acclimate to the operating environment before applying power. This requires the unpackaged system or component to reside in the operating environment for up to 16 hours in order to thermally stabilize and prevent condensation.

Table 15. Hardware acclimation times

Transit/storage environment		Operating environment temperature	Acclimation time
Temperature	Humidity	-	
Nominal 68-72°F (20-22°C)	Nominal 40-55% RH	Nominal 68-72°F (20-22°C) 40-55% RH	0-1 hour
Cold <68°F (20°C)	Dry <30% RH	<86°F (30°C)	4 hours
Cold <68°F (20°C)	Damp ≥30% RH	<86°F (30°C)	4 hours
Hot >72°F (22°C)	Dry <30% RH	<86°F (30°C)	4 hours
Hot >72°F (22°C)	Humid 30-45% RH	<86°F (30°C)	4 hours
	Humid 45-60% RH	<86°F (30°C)	8 hours
	Humid ≥60% RH	<86°F (30°C)	16 hours
Unknown		<86°F (30°C)	16 hours

- If there are signs of condensation after the recommended acclimation time has passed, allow an additional 8 hours to stabilize.
- Systems and components must not experience changes in temperature and humidity that are likely to cause condensation to form on or in that system or component. Do not exceed the shipping and storage temperature gradient of 45°F/hr (25°C/hr).

Remove, install, or store replaceable units

Use the following precautions when removing, handling, or storing replaceable units:

WARNING: Some replaceable units have most of their weight in the rear of the component. Ensure that the backend of the replaceable unit is supported while installing or removing it. Dropping a replaceable unit could result in personal injury or damage to the equipment.

WARNING: A sudden jar drop, or even a moderate vibration can permanently damage some sensitive replaceable units.

NOTE: For a module that must be installed into a slot in an enclosure, examine the rear connectors on the module for any damage before attempting its installation.

- Do not remove a faulted replaceable unit until you have the replacement available.
- When handling replaceable units, avoid electrostatic discharge (ESD) by wearing ESD anti-static gloves or an ESD wristband with a strap.
- Avoid touching any exposed electronic components and circuits on the replaceable unit.
- Never use excessive force to remove or install a replaceable unit. Take time to read the instructions carefully.
- Store a replaceable unit in the anti-static bag and the specially designed shipping container in which you received it. Use the anti-static bag and special shipping container when you need to return the replaceable unit.

- Replaceable units must acclimate to the operating environment before applying power. This requires the unpackaged component to reside in the operating environment for up to 16 hours in order to thermally stabilize and prevent condensation. Ensure that the replaceable unit has thermally stabilized to the operating environment.
- Front bezels should always be attached to ensure EMI compliance. Ensure that you reattach the bezel after replacing a component.
- Each I/O module or drive slot should contain a component or filler panel to ensure proper air flow throughout the system.

Unpack a part

Use these best practices to unpack a part.

Steps

1. Wear ESD gloves or attach an ESD wristband to your wrist and the enclosure in which you are installing the part.
2. Unpack the part and place it on a static-free surface.
3. If the part is a replacement for a faulted part, save the packing material to return the faulted part.

B

Power control procedures

Learn how to power down and power up the system.

Topics:

Power control procedure considerations

Note the following before you get started:

- Powering off a node, appliance, or cluster can take several minutes to complete.
- In a true emergency power off situation, turn the cabinet power switches to the off position to immediately remove power from the all cabinet components.
- Working with hardware may cause electrostatic discharge that could damage your hardware. Before working with any hardware, take precautions around handling replaceable units. See Safety precautions for handling replaceable units.
- If you are relocating or replacing hardware, to help identify associated enclosures when you are ready to cable and power on:
  - Ensure that you make a note of the cabling between enclosures and the appliances. If you used cable labels at the time of initial installation, reconnecting the cables is easier.
  - Ensure that you also record the Dell Service Tag of each enclosure in your cluster.
- Nodes in the appliance power on into the same mode they were in before the appliance was powered off. If a node powers on in service mode:
  1. Log in to the appliance from an SSH client.
  2. Run the `svc_rescue_state clear` command to clear the boot mode.
  3. Run the `svc_node reboot` command to reboot the node. Once rebooted, the node returns to normal mode.

  For more information about the service scripts, see the *PowerStore Service Scripts Guide*.
- If both nodes in an appliance reboot in service mode, always return Node A to normal mode first to avoid management software conflicts. After Node A is operating normally, you can return Node B to normal mode.
- Before powering down an appliance with metro volumes, ensure that the role of the metro volumes on the appliance are all set to nonpreferred. For information about setting metro volume roles, see the *Protecting Your Data* guide.

Power control procedures preview

CAUTION: Do not power off by pulling cables from the back of the appliance to initiate a shutdown sequence. Use PowerStore Manager or a service script to perform all graceful shutdown operations.

The following table provides a preview of the steps that are required to power off, power on, or reboot the relevant component in your cluster:

Table 16. Power control procedures preview

Component	Action	Procedure
Node	Power off	Use PowerStore Manager or run a service script.

Table 16. Power control procedures preview (continued)

Component	Action	Procedure
	Power on	• If the node was removed from the chassis, reseat the node into the chassis, and reconnect its power cable. • If the node was not removed from the chassis, run a service script.
	Reboot	Use PowerStore Manager or run a service script.
Appliance	Power off	Use PowerStore Manager or run a service script.
	Power on	If the nodes or expansion enclosures were removed from the chassis, reseat the expansion enclosures and nodes. Reconnect power cables in the right order.
Cluster	Power off	Use PowerStore Manager or run a service script.
	Power on	If the nodes or expansion enclosures were removed from the chassis, reseat the expansion enclosures and nodes. Reconnect power cables in the right order.

Powering off procedures for PowerStore node

This section includes the following procedures:

- Power off a node using PowerStore Manager
- Power off a node using a service script

Power off a node using PowerStore Manager

Prerequisites

Obtain the following information:

- Management IP address of the cluster to log in to PowerStore Manager.
- PowerStore Manager user account credentials with administrator privileges and knowledge of the service account credentials.

NOTE: Do not power off or reboot a node if the peer node is not operating normally. If the peer node is experiencing any major issues, associated alerts and events appear in PowerStore Manager.

Also, to avoid service interruptions, ensure that there are sufficient and healthy paths from all connected hosts to the peer node.

About this task

NOTE: If you are unable to access PowerStore Manager, see Power off a node using a service script.

NOTE: TLC flash drives retain data for up to 90 days while powered off. Data corruption may occur if the drives are powered off for more than 90 days or if they are stored in temperatures above 40° C (104° F).

NOTE: QLC flash drives retain data for up to 30 days while powered off. Data corruption may occur if the drives are powered off for more than 30 days or if they are stored in temperatures above 40° C (104° F).

Steps

1. Under **Hardware**, select the appliance that includes the node you want to power off.
2. On the **Appliance Details** page, select the **Components** card.
3. On the **Components** card, under **Internal View**, select the node that you want to power off.
4. Under **More Actions**, select **Power Down**.
5. On the confirmation prompt, enter the service password, and then click **Power Down**.

Next steps

To verify that the node has powered off, check the status of the LEDs in the rear of the chassis. Other than the LEDs for the power supply unit, management port, and service port, all LEDs on the node must be OFF. The Unsafe to Remove LED on the active or peer node is ON.

Power off a node using a service script

Prerequisites

Obtain the following information:

- Management IP address of the appliance that contains the node. In PowerStore Manager, go to **Settings** > **Networking** > **Network IPs** > **Management**. Review the **Management IPs** table to identify the management IP address associated with the appliance.
- Service account credentials

NOTE: Do not power off or reboot a node, if the peer node is not operating normally. If the peer node is experiencing any major issues, associated alerts and events appear in PowerStore Manager.

Also, to avoid service interruptions, ensure that there are sufficient and healthy paths from all connected hosts to the peer node.

About this task

NOTE: TLC flash drives retain data for up to 90 days while powered off. Data corruption may occur if the drives are powered off for more than 90 days or if they are stored in temperatures above 40° C (104° F).

NOTE: QLC flash drives retain data for up to 30 days while powered off. Data corruption may occur if the drives are powered off for more than 30 days or if they are stored in temperatures above 40° C (104° F).

Steps

1. Launch an SSH client, and connect to the appliance using the management IP address.

   NOTE: External SSH management access must be enabled on the appliance.

2. Enter the username and password that is associated with the service account, and log in.

   The login prompt indicates the node that you are logged into. For example, the letter `"A"` in the prompt `[SVC:user@DST5467-A~]$` indicates that you are logged into node A.

3. Based on the node you are logged into, run one of the following commands:
   - `svc_node shutdown local` to power off the node you are logged into.
   - `svc_node shutdown peer` to power off the peer node.

Next steps

To verify that the node has powered off, check the status of the LEDs in the rear of chassis. Other than the LEDs for the power supply unit, management port, and service port, all LEDs on the node must be OFF. The Unsafe to Remove LED on the active or peer node is ON.

Powering on procedures for PowerStore node

This section includes the following procedures:

- Power on a node using a service script
- Power on a node by reseating the node

Power on a node using a service script

Prerequisites

Obtain the following information:

- Management IP address of the appliance that contains the node. In PowerStore Manager, go to **Settings** > **Networking** > **Network IPs** > **Management**. Review the **Management IPs** table to identify the management IP address associated with the appliance.
- Service account credentials

About this task

Use the following procedure to power on a node in scenarios such as:

- You are remote and cannot reseat the node.
- The node was not removed from the chassis.
- The embedded module, I/O module, or 4-port card were replaced.

Steps

1. Launch an SSH client, and connect to the appliance using the management IP address. Since only the peer node is powered on, you are connected directly to the peer node of the appliance.
2. Enter the username and password that is associated with the service account, and log in.
3. Run the following command:

   ```
   svc_node power_on
   ```

4. Wait for the node to power on.

   NOTE: It may take several minutes for the node to power on.

Power on a node by reseating the node

About this task

Use the following procedure to power on a node after it was removed from the chassis:

Steps

1. Reseat the node into the chassis.

   The node powers on automatically.
2. Reconnect the power cable.
3. Wait for the node to complete powering on.

Rebooting procedures for a PowerStore node

This section includes the following procedures:

- Reboot a node using PowerStore Manager
- Reboot a node using a service script

Reboot a node using PowerStore Manager

Prerequisites

Obtain the following information:

- Management IP address of the cluster to log in to PowerStore Manager.
- PowerStore Manager user account with administrator privileges.

NOTE: Do not power off or reboot a node if the peer node is not operating normally. If the peer node is experiencing any major issues, associated alerts and events appear in PowerStore Manager.

To avoid service interruptions, ensure that there are sufficient and healthy paths from all connected hosts to the peer node.

About this task

Use the following procedure to reboot a node using PowerStore Manager:

Steps

1. Under **Hardware**, select the appliance that includes the node you want to reboot.
2. On the **Appliance Details** page, select the **Components** card.
3. On the **Components** card, under **Rear View**, expand **Base Enclosure**, and then select the node that you want to reboot.
4. Under **More Actions**, select **Reboot**.
5. On the confirmation prompt, select **Confirm you want to reboot the node**, and then click **Reboot**.

Reboot a node using a service script

Prerequisites

Obtain the following information:

- Management IP address of the appliance that contains the node. In PowerStore Manager, go to **Settings** > **Networking** > **Network IPs** > **Management**. Review the **Management IPs** table to identify the management IP address associated with the appliance.
- Service account credentials

NOTE: Do not power off or reboot a node, if the peer node is not operating normally. If the peer node is experiencing any major issues, associated alerts and events appear in PowerStore Manager.

Also, to avoid service interruptions, ensure that there are sufficient and healthy paths from all connected hosts to the peer node.

About this task

Use the following procedure to reboot a node using a service script:

Steps

1. Launch an SSH client, and connect to the appliance using the management IP address.
2. Enter the username and password for the service account to log in.

   The login prompt indicates the node that you are logged into. For example, the letter `"A"` in the prompt `[SVC:user@FNM12345678910-A~]$` indicates that you are logged into node A.
3. Based on the node you are logged into, run one of the following commands:
   - `svc_node reboot local` to reboot the node you are logged into.
   - `svc_node reboot peer` to reboot the peer node.

   For more information, see the *PowerStore Service Scripts Guide*.

Power off an appliance

Prerequisites

- Do not power off the appliance if you are replacing a hardware component. Identify the node that includes the faulted hardware component, and power off only that node. For more information, see Power off a node using PowerStore Manager.
- Powering off an appliance results in the mapped hosts losing access to the data on the appliance. Before you begin, ensure that you temporarily disconnect host access from all storage resources.
- Obtain the following information:

- Management IP address of the appliance. In PowerStore Manager, go to **Settings** > **Networking** > **Network IPs** > **Management**. Review the **Management IPs** table to identify the management IP address associated with the appliance.
- Service account credentials
- Service tags of the appliance
- If applicable, service tags of the associated expansion enclosures

About this task

Use the following procedure to power off a single appliance. To power off all of the appliances in a cluster, see Power off a cluster using PowerStore Manager.

NOTE: TLC flash drives retain data for up to 90 days while powered off. Data corruption may occur if the drives are powered off for more than 90 days or if they are stored in temperatures above 40° C (104° F).

NOTE: QLC flash drives retain data for up to 30 days while powered off. Data corruption may occur if the drives are powered off for more than 30 days or if they are stored in temperatures above 40° C (104° F).

Steps

1. Log in to PowerStore Manager.
2. Determine the primary appliance by going to **Settings** > **Cluster** > **Properties**.
3. If the appliance you are shutting down is the primary appliance:
   a. Launch an SSH client, and connect to the appliance using the management IP address.
   b. Enter the username and password that is associated with the service account, and log in.
   c. Run the following command to determine which nodes are eligible to become the new primary node:

      ```
      svc_cluster_management GetClusterStatus
      ```

   d. Run the following command to specify which appliance you want to become the new primary appliance:

      ```
      svc_cluster_management MovePrimaryAppliance -n <ID number of new primary node>
      ```

4. In PowerStore Manager, under **Hardware**, select the appliance that you want to power off.
5. Under **More Actions**, select **Power Down**.
   The **Validation** window opens.
6. Review any errors, warnings, and recommendations. Once the appliance passes all of the validation checks, click **Next**.
   The **Active Objects** window opens.
7. Review the list of objects on the appliance that had I/O activity during the last five minutes.
8. Click **Next**.
   The **Confirm** window opens.
9. Enter the service password, and click **Power Down**.
10. Check the status of the LEDs in the rear of chassis to verify that the appliance has powered off. Other than the LEDs for the power supply unit, management port, and service port, all other LEDs on the appliance must be OFF.
11. Wait five minutes, and then disconnect the power cables from the base enclosure.
12. Disconnect the power cables from any associated expansion enclosures.

Power on an appliance

About this task

Use the following procedure to power on an appliance:

Steps

1. If nodes were removed, reseat the nodes into the base enclosure chassis.
2. If applicable, ensure that expansion enclosures are also reseated into the cabinet.
3. If applicable, reconnect the power cables to each associated expansion enclosure in an ascending order, such as the following:
   - Expansion enclosure 0

- Expansion enclosure 1
- Expansion enclosure 2

The power status LEDs on each expansion enclosure turn on when the power cable is connected.

4. Reconnect the power cables to node A first, and then node B.
   The Node Power LEDs on both nodes turn on when the power cable is connected.

Power off a cluster using PowerStore Manager

Prerequisites

- Powering off a cluster results in the mapped hosts losing access to the data on the cluster. Before you begin, ensure that you temporarily disconnect host access from all storage resources.
- Check if any VMs are using the storage from the cluster. It is recommended to power off the VMs before powering off the cluster.
- When the cluster is powered off, you have no access to the UI, API, or CLI interfaces. Print the power on instructions to ensure that you have the information you require to power on the cluster in a specific order. You can also find these instructions on dell.com/powerstoredocs.
- Obtain the following information:
  - Management IP address of the cluster
  - Service account credentials
  - Site ID
  - Service tags of the appliances
  - If applicable, service tags of the associated expansion enclosures

About this task

NOTE: TLC flash drives retain data for up to 90 days while powered off. Data corruption may occur if the drives are powered off for more than 90 days or if they are stored in temperatures above 40° C (104° F).

NOTE: QLC flash drives retain data for up to 30 days while powered off. Data corruption may occur if the drives are powered off for more than 30 days or if they are stored in temperatures above 40° C (104° F).

Steps

1. In PowerStore Manager, select the **Settings** icon, and then select **Power Down** in the **Cluster** section.
2. Click **Power Down Cluster**.
   The **Validation** window opens.
3. Click **Perform validation**.
4. Review any errors, warnings, and recommendations. If the cluster passes all the validation checks, click **Next**. If there are remaining errors that can safely be ignored, select **Ignore errors and proceed, regardless of possible data loss**, and then click **Next**.
   The **Active Objects** window opens.
5. Review the list of objects on the appliance that had I/O activity during the last five minutes.
6. Click **Next**.
   The **Confirm** window opens.
7. Enter the service password, and click **Power Down**.
8. Check the status of the process by looking at the Node Power LEDs. The power off process is complete when the Node Power LEDs for all nodes in the cluster are off.
9. After confirming that the cluster has shut down, disconnect the power cables from both nodes in one of the base enclosures in the cluster, if required. Wait a few seconds and confirm that all remaining LEDs have turned off.
10. Disconnect the power cables from each of the associated expansion enclosures to power them down, if required.
11. If your cluster has more than one appliance, repeat the previous two steps to disconnect power from the remaining appliances in the cluster.

Power on a cluster

About this task

Use the following procedure to power on a cluster:

Steps

1. If nodes were removed, reseat the nodes into the relevant base enclosure chassis.
2. If applicable, for each appliance in the cluster, ensure that expansion enclosures are also reseated into the cabinet.
3. If applicable, for each appliance in the cluster, reconnect the power cables to each expansion enclosure in the following order:
   - Expansion enclosure 0
   - Expansion enclosure 1
   - Expansion enclosure 2

   The power status LEDs on each expansion enclosure turns on when the power cable is connected.
4. For each appliance, reconnect the power cables to node A first, and then node B.

   The Node Power LED on each node turns on when the power cable is connected.

C

Transferring the internal battery backup module

Learn how to transfer the internal battery backup module from a faulted node to a replacement node.

NOTE: Review the information in Safety precautions for handling replaceable units before handling replaceable parts.

Topics:

- Remove the internal battery backup module
- Install the internal battery backup module

Remove the internal battery backup module

Steps

1. Lift the gray padding away from the internal battery backup module.
2. Remove the clip around the internal battery backup module by pulling the tab on the left side.
3. Disconnect the internal battery backup module cable from the motherboard.

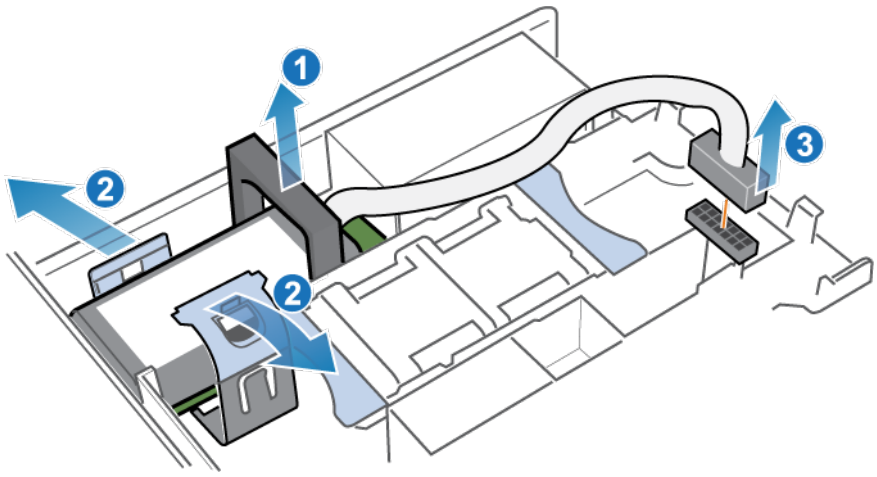


Figure 273. Releasing the internal battery backup module

4. Lift the internal battery backup module away from the motherboard.

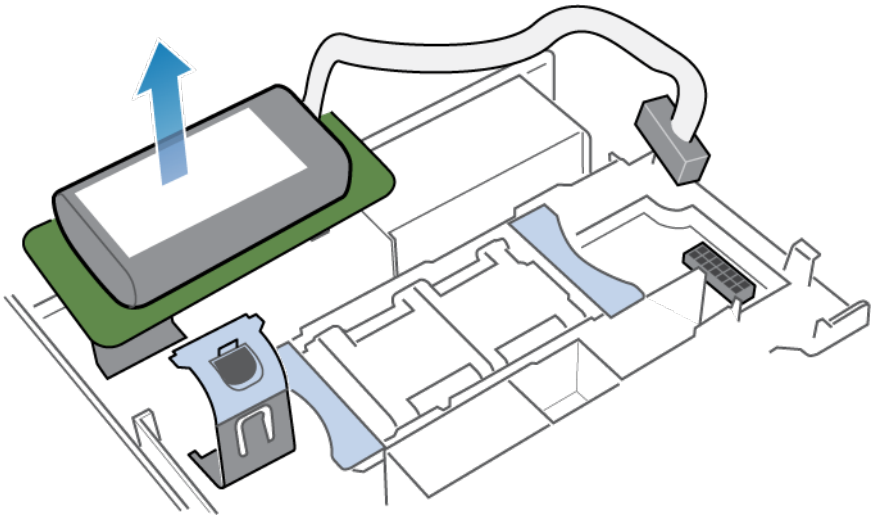


Figure 274. Removing the internal battery backup module from the motherboard

Install the internal battery backup module

Install the internal battery backup module into the replacement node.

Steps

1. Place the internal battery backup module into position on the motherboard.

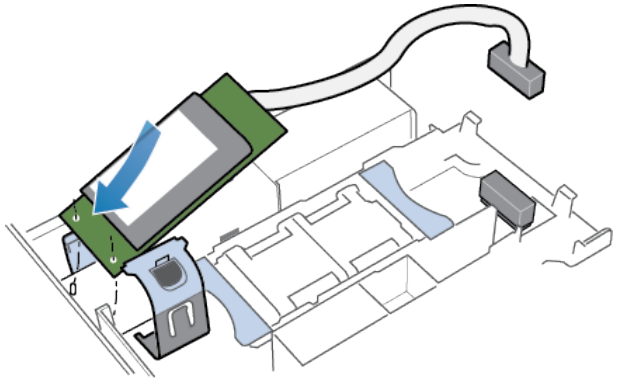


Figure 275. Placing the internal battery backup module into position

2. Close the clip around the center of the internal battery backup module until it clicks into place.
3. Replace the gray padding around the top of the internal battery backup module.
4. Connect the internal battery backup module cable to the motherboard.

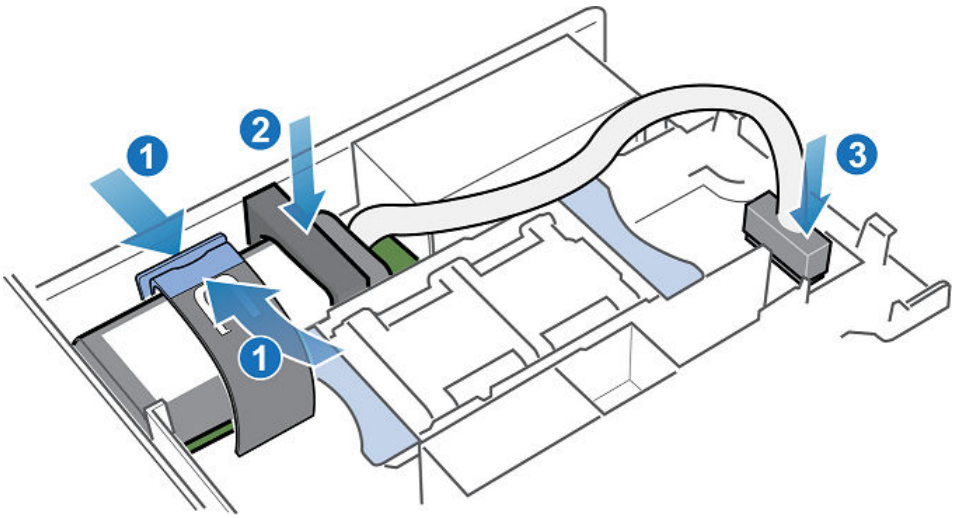


Figure 276. Connecting the internal battery backup module cable to the motherboard

5. Verify that internal battery backup module cable is properly routed through the cable retainer clips.

D

Data collection

Learn how to collect support materials to help troubleshoot the appliances in your system.

Topics:

Support materials collection

You can collect support materials to help troubleshoot the appliances in your system.

Depending on the option you choose, support materials can include system logs, configuration details, and other diagnostic information. Use this information to analyze performance issues, or send it to your service provider so they can diagnose and help you resolve the issues. This process does not collect user data.

You can collect support materials for one or more appliances. When you start a collection, data is always collected at the appliance level. For example, if you request a collection for a volume, the system collects support materials for the appliance that contains the volume. If you request a collection for multiple volumes, the system collects support materials for all appliances that contain the volumes.

You can set a timeframe for collecting support materials. Setting a timeframe can result in smaller and more relevant data collection which is easier to analyze . You can either set a predefined timeframe or set a custom timeframe that suits your needs.

You can also include additional information in the support materials collection from **Advanced collection options**. Collecting additional information can take longer than the default support materials collection, and the size of the resulting data collection is larger. Select this option if your service provider requests it. By default the support materials collection uses the *essentials* profile. Use the `svc_dc` service script to collect support materials for other profiles. See the PowerStore Service Scripts Guide for more information about the `svc_dc` service script and the available profiles.

NOTE: The system can run only one collection job at a time.

You can perform the following actions on a collection of support materials:

- View information about existing collections.
- Upload a collection to support, if remote support through Secure Remote Services is enabled.
- Download a collection to a local client.
- Delete a collection.

NOTE: Some of these operations might not be available if the cluster is operating in a degraded state.

Collect support materials

Steps

1. Select the **Settings** icon, and then select **Gather Support Materials** in the **Support** section.
2. Click **Gather Support Materials**.
3. Type a description of the collection in the **Description** field.
4. Select the timeframe for the data collection.

   You can select one of the available options from the **Collection Timeframe** drop-down menu, or select **Custom** and set a timeframe.

   NOTE: If you select **Custom** as the timeframe for the data collection, the estimated finish time for the data collection is displayed in the **Collection Timeframe Finish** column of the **Support Materials Library** table.

5. Select the type of support data to collect from the **Object type** drop-down menu.
6. In the **Objects to collect data for:** area, select the check boxes of the appliances from which to collect support data.
7. To send the data collection to support when the job completes, select the **Send materials to Support when finished** check box.

   NOTE: This option is available only when Support Connectivity is enabled on the system. You can also send the data collection to support from the **Gather Support Materials** page after the job is completed.

8. Click **Start**.
   The data collection is initiated, and the new job appears in the **Support Materials Library** table. You can click the job entry to view its details and progress.

Results

When the job is completed, the job information is updated in the **Support Materials Library** table.

Next steps

After the job is finished, you can download the data collection, send the data collection to support, or delete the data collection.

E

Maintenance windows

Learn how to enable and disable maintenance windows. During a maintenance window, actions such as unplugging cables and swapping out components will not erroneously alert Customer Support of an outage.

Topics:

Enable a maintenance window

Enable a maintenance window before performing procedures that might erroneously notify Customer Support of problems with the system.

Steps

1. Select the **Settings** icon, and then select **Maintenance Window** in the **Support** section.
2. Select the appliance for which you want to enable a maintenance window and click **Enable/Modify**.
3. In the Maintenance Window Duration field, type the number of days and hours for the maintenance window duration.

   NOTE: Specify a time period that is longer than the time it takes to complete the procedure.

4. Click **Apply**.

Results

- The system displays a "Maintenance window was successfully enabled" message that is highlighted in green.
- The Status column shows "Enabled."
- The End Time (Cluster Time) column shows the date and time when the system will re-enable support notifications for the appliance.
- Under **Settings** > **Support**, the system shows "Enabled" next to **Maintenance Window**.

Disable a maintenance window

Disable a maintenance window after completing a procedure that might have erroneously notified Customer Support of problems with the system.

Steps

1. Select the **Settings** icon, and then select **Maintenance Window** in the **Support** section.
2. Select the appliance for which you want to disable the maintenance window and click **Disable**.
3. Click **Apply**.

Results

- The system displays a "Maintenance window was disabled successfully" message that is highlighted in green.
- The Status column shows "Disabled."
- Under **Settings** > **Support**, the system no longer shows "Enabled" next to **Maintenance Window**.

F

Add appliances to the cluster

Learn how to add appliances to the cluster.

Topics:

Add appliances to the cluster

Prerequisites

- You can only have up to four appliances in a cluster.
- Ensure that the cluster is functional and in a healthy state. If any other appliance in the cluster is not operational, you may not be able to add an appliance.
- Ensure that the appliances you are adding are in an unconfigured, original factory setting state.
- Obtain the Service Tag of the appliances that you want to add.
- Ensure that you have a sufficient number of unused IP addresses for each appliance. For each appliance you want to add, have at least four IP addresses for the management network and three IP addresses for the storage network. Work with your network administrator to provision and obtain more IP addresses, if necessary. To review, or add more IP addresses, select the **Settings** icon, and then select **Network IPs** in the **Networking** section.

NOTE: The cluster and appliance you are adding must be running the same PowerStoreOS version before the appliance can be added to the cluster. Clusters on PowerStoreOS 3.0.x and later automatically detect if there is a mismatch between operating system versions and provide the option to synchronize during the **Add Appliance** wizard.

For clusters on PowerStoreOS 2.x and earlier where the appliance is running a later version of the PowerStoreOS than the cluster, upgrade the cluster before adding the new appliance.

For clusters on 2.x and earlier where the cluster is running a later version of the PowerStoreOS than the appliance, the appliance should be installed in the same rack and use the same switches as the existing cluster, and configured into its own separate cluster. Then, upgrade the operating system of the separate cluster. See KB article 000133192 (PowerStore Manager prevents "Add an appliance to an existing cluster") for more information.

About this task

To add appliances to the cluster:

Steps

1. Under **Hardware**, click **Add** in the **Appliances** tab.
2. Follow the prompts in the **Add Appliance** wizard to select and add the appliances to your cluster.

   NOTE: When this process is running, do not run commands, such as adding external hosts or changing CHAP configurations, which can change the state of the cluster.

   NOTE: Any operations started while the Add Appliance process is running will not run until the Add Appliance operation is complete.

3. If the PowerStoreOS version of the cluster does not match the PowerStoreOS of the appliance being added, you will be prompted to synchronize software versions before adding the appliance. Click **Synchronize** to initiate the version synchronization.
   When the synchronization is complete, you will be returned to the **Add Appliance** wizard. Proceed with the rest of the steps of the wizard.
4. If necessary, upload and install any thin packages that were not installed on the new appliance. See KB article 000226460 (Previously installed thin packages missing following Add Appliance) for more information.

G

Remove appliances from the cluster

Learn how to remove appliances from the cluster.

Topics:

Remove an appliance from a cluster

Prerequisites

- Identify the Service Tag of the appliance that you want to remove. For details, see the Hardware Information Guide for PowerStore 1000, 1200, 3000, 3200, 5000, 5200, 7000, 9000, and 9200 or Hardware Information Guide for PowerStore 500T Model .
- If the appliance that you want to remove is not functional, contact your service provider for assistance with removing the appliance.
- Ensure the appliance that you want to remove is not running NAS services.
- Ensure that the appliance is not the only appliance in the cluster.
- Stop and remove all running or scheduled import, migration, or replication jobs on the appliance to remove, and remove all remote systems that are associated with the appliance.
- Before starting the appliance removal process, migrate storage objects from the appliance that you want to remove to another appliance in the cluster. To migrate storage objects, see Migrate storage objects from an appliance.

About this task

A factory reset is performed on an appliance when it is removed from a cluster.

NOTE: When the appliance removal process is running, do not run commands that can change the state of the cluster, such as adding external hosts or changing CHAP configurations.

Steps

1. If the appliance you want to remove is the primary appliance in the cluster, run the following command to move the primary appliance to another appliance:

   ```
   svc_cluster_management MovePrimaryAppliance -n <ID number of new primary node>
   ```

2. Disable support notifications on the PowerStore cluster as described in Enable a maintenance window.
3. Under **Hardware**, select **Appliances**, and find the appliance with the Service Tag identified in Prerequisites.
4. Run the `svc_appliance_provisioning` script to disable resource balancing and prevent objects from being automatically created or placed on the appliance that you want to remove.
   a. Open an SSH client, and connect to the management IP address of the appliance to remove.

      NOTE: External SSH management access must be enabled on the appliance.

   b. Type the username and password of the service account to log in to the appliance.
   c. Run the following command to display the names of the appliances in the cluster:

      ```
      svc_appliance_provisioning list
      ```

   d. Run the following command, where *appliance_name* is the name of the appliance that you want to remove:

      ```
      svc_appliance_provisioning disable appliance_name
      ```

e. Run the following command to ensure that the provision status of the appliance is disabled:

```
svc_appliance_provisioning list
```

5. Ensure that Node A is the primary node on the appliance to be removed using PowerStore Manager.

   The factory reset of the appliance cannot occur unless Node A is the primary node of the appliance .

   a. Under **Hardware**, select **Appliances**, and select the appliance that you want to remove.
   b. Select the **Components** card, select the **Rear View** tab.
   c. Ensure that Node A is the primary node on the appliance.

      If the Node B is the primary node of the appliance, select Node B in the **Rear View** tab, and select **More Actions** > **Reboot** to reboot Node B and make Node A the primary node.

6. If there still are storage objects on the appliance to be removed, use PowerStore Manager to migrate the storage objects to another appliance in the cluster or remove the storage objects from the appliance.
7. Remove the appliance from the cluster in PowerStore Manager.

   NOTE: The system resets the appliance to original factory settings and powers it off during the removal process.

   a. Under **Hardware**, select **Appliances**.
   b. Select the check box of the appliance to remove.
   c. Click **Remove**.

      The **Removing the Appliance** dialog box is displayed.
   d. Click **Remove**.

   The appliance is removed from the cluster and reset to its factory default settings. The appliance can be rediscovered and deployed to a new or existing cluster after it is reset to factory default settings.

   NOTE: The factory reset of the appliance can take up to 1.5 hours to complete.

Migrate storage objects from an appliance

Use appliance storage object migration to move storage resources to another appliance or multiple appliances in the cluster. This feature is applicable if you want to evacuate space from an appliance, power off an appliance, or remove an appliance from a cluster.

About this task

Volumes, volume groups, and vVols are eligible for migration. When you migrate a storage object, all associated snapshots and thin clones are also migrated.

The following storage objects are not eligible for migration:

Table 17. Storage objects ineligible for migration

Ineligible object	How to make the object eligible
File objects	File objects cannot be migrated.
Volumes or volume groups in an active import session	Wait for the import session to end.
Volumes, volume groups, or vVols in an active internal migration	If the system is migrating objects from the appliance, wait for the migration to end. If the system is migrating objects to the appliance, consider canceling the migration.
Offline volumes	The volume is offline due to metadata inconsistencies. Contact your service provider to bring it online.
vVols with bound snapshots	Interrupt the VMware operation that created the bound snapshot or wait for the process to complete.
vVol bound fast clones	Power off the linked clones of the VM that the vVol belongs to.

You cannot migrate storage objects from an appliance that is out of space and has entered read-only mode. If an appliance is out of space, you must add more storage capacity or delete storage objects until the appliance has at least 16 GB of free space.

To migrate storage objects to another appliance in the cluster:

Steps

1. Under **Hardware**, select the appliance from which you want to migrate storage objects.
2. Under **More Actions**, select **Migrate**.
3. Follow the prompts in the **Migration** wizard to migrate storage objects to another appliance.

   NOTE: The maximum number of storage objects that you can select for a single migration action is 4000.

Results

The LUN ID of a volume changes automatically when a volume is migrated from one PowerStore appliance to another appliance in the same cluster.

Follow these guidelines when migrating a boot volume:

- Power off the connected host before migrating the boot volume. Then, change the LUN ID for the boot volume after the migration is performed and power on the host.
- The recommend Host LUN ID for a boot LUN is 0.
- After migrating a boot from SAN volume, the LUN ID can be changed back to 0.

NOTE: For instructions on changing the LUN, see the PowerStore Host Configuration Guide.

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Reinitialize the system

Learn how to reset the entire system to the original, default factory settings.

Topics:

Reinitialize the system

Reinitializing the system resets the entire system to the original, default factory settings. You can reinitialize the system using service scripts. To use service scripts to reinitialize the system, see the *PowerStore Series Service Scripts Guide*.

CAUTION: Reinitializing the system will result in data loss.

NOTE: Do not disconnect, remove, replace, or swap system parts before or during system reinitializing. Any such changes will cause the reinitialization to fail.