Dell EMC PowerProtect DD9400

Version 7.0

Field Replacement Unit and Customer Replacement Unit Guide

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DELL EMC

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CHAPTER 1

FRU and Upgrade Overview

The tool, safety, and connection information in this chapter applies to all component replacement procedures for the PowerProtect system. Verify that the required tools are available, review the safety information, and connect to the system before proceeding.

This chapter contains the following information:

Tools and supplies needed

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

You will need:

- Antistatic wrist strap and conductive foam pad
- Screwdrivers:
  - Phillips #1
  - Phillips #2 with a 4- to 6-inch blade and a magnetic tip
  - Phillips #2 with a 12 in. or longer blade and magnetic tip
  - Flat head with a 3/16 in. blade
  - Flat head with a 1/4 in. blade
  - Torx T8
  - Torx T10
  - Torx T30 with adjustable torque setting
  - Torque
- Flashlight (free-standing for single-person installations)
- Roll of 5/8 inch Velcro cable tie material (3M Scotchmate SJ-3401 or similar)
- Null modem cable with DB-9 female connector to connect a service laptop to the PowerProtect system.
- Power adapter or a power cord for your laptop power adapter so that you can power your laptop from a rack PDU

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

- Torque screwdriver
- Pliers
  - Needle nose
  - Regular
  - Locking
- 10 mm socket or wrench
- Diagonal wire cutters (for cutting tie wraps)
- exFAT formatted 4 GB or greater USB flash memory drive
- Tie wraps (4 in. and 8 in.)
- Labels
- Pen or marker
- Masking tape

Safety overview

CAUTION

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

Review this list of important safety recommendations.

- All plug-in modules and blank plates are part of the fire enclosure and must be removed only when a replacement can be added immediately. The system must not be run without all parts in place.
- A DD9400 system must be operated only from a power supply input voltage range of 100–240 VAC and 50–60 Hz.
- The system is intended to operate with all installed power supplies working as intended.
- Provide a suitable power source with electrical overload protection.
- A safe electrical earth connection must be provided to each power cord. Check the grounding of the power sources before applying power.
- The plug on each power supply cord is used as the main device to disconnect power from the system. Ensure that the socket outlets are located near the equipment and are easily accessible.
- Permanently unplug the unit if you think it is damaged in any way and before moving the system. To completely remove system power, you must disconnect all power supplies.
- The power connections must always be disconnected prior to removal or replacement of a power supply module from any of the components in the system.
- A faulty power supply module should be replaced within 24 hours.
- Do not lift system components by yourself. A DD9400 system weighs up to 63.05 lbs (28.6 kg).

  CAUTION PowerProtect systems are heavy. Use at least two people or a mechanical lift to move any system.
- To comply with applicable safety, emission, and thermal requirements, covers must not be removed and all bays must be fitted with plug-in modules.
- For ESD protection, Dell EMC recommends that you wear a suitable antistatic wrist or ankle strap. Observe all conventional ESD precautions when handling plug-in modules and components.

Safety instructions

WARNING Whenever you need to lift the system, get others to assist you. To avoid injury, do not attempt to lift the system by yourself.

WARNING Opening or removing the system cover while the system is powered on may expose you to a risk of electric shock.

CAUTION Do not operate the system without the cover for a duration exceeding five minutes. Operating the system without the system cover can result in component damage.

CAUTION Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.Always use a static mat and anti-static wristband while working on components inside the system.

Note: It is recommended that you always use an anti-static mat and an anti-static wristband while working on components inside the system.

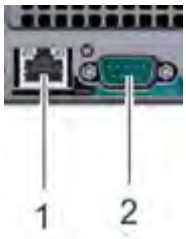
CAUTION To ensure proper operation and cooling, all bays in the system and system fans must be always populated with a component or a blank.

Establish a connection to the PowerProtect system

About this task

The PowerProtect system supports a direct serial connection, or serial over LAN (SOL). Both methods cannot be enabled at the same time. The serial port and Ethernet ports are located on the back of the system, below the three PCI risers. The serial port is located on the back of the system.

Figure 1 Maintenance connections



1. Ethernet port
2. Serial port (COM 1)

Procedure

1. Verify with the customer whether the system uses a serial connection or SOL, and follow one of the procedures below as required.

Establish a serial connection

Procedure

1. Connect an administrative console to the serial port.
2. Launch a terminal emulation program from your computer and configure the following communication settings:

   Note: 115200 baud rate is required for the system to work correctly; 9600 baud rate does not work.

Table 1 Communications settings

Setting	Value
Baud rate	115200
Data bits	8
Stop bits	1
Parity	None
Flow control	None

Table 1 Communications settings (continued)

Setting	Value
Emulation	VT-100

3. Log in as sysadmin.

Establish an SOL connection

Before you begin

The system must be configured to accept SOL connections. The Hardware Overview and Installation Guide for this system provides instructions to configure the system for SOL.

Procedure

1. Open an SSH shell.
2. Run the following command to connect to iDRAC.

   `ssh <iDRAC-IP-address> -l <iDRAC-username>`.

3. Log in with the credentials for the iDRAC username.
4. Run one of the following commands to initiate the SOL session.
   - `console com2`
   - `connect`

FRU power status

The following table lists the replaceable components, whether the component is hot-swappable, and whether the procedure can be completed by a customer (CRU) or a Dell EMC or partner technician (FRU):

Component	Hot-swappable	CRU/FRU
Bezel	Y	CRU
Front disk (OS and cache)	Y	CRU
Power supply	Y	CRU
Cable management accessory	Y	CRU
Fan	N	CRU
DIMM	N	CRU
Network daughter card	N	CRU
PCIe HBA/PCIe HBA mini-card	N	CRU
HBA330	N	CRU
TPM	N	FRU
System board	N	FRU

Component	Hot-swappable	CRU/FRU
CPU/heatsink	N	FRU
Rail kit	N	CRU

CHAPTER 2

Replace an Operating System Disk

Complete the following procedure to replace a disk mounted in the front of the chassis.

This CRU can be completed with the system powered on.

After replacing the disk, it takes approximately 2 hours to complete the rebuild operation on the new disk.

Note: This is a baseline value, and may take significantly longer depending on the amount of activity on the system.

Identify a failed OS disk

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to identify the failed drive.

Procedure

1. Verify the drive fault LED on the left control panel at the front of the system is illuminated solid amber.

   Figure 2 Drive fault LED

2. Run the `alerts show current` command to identify the location of the failed disk. Record the slot number of the failed disk.

   CAUTION The physical labeling of the disks on the system chassis, and the disk numbering in DD OS do not match. The physical labeling starts with Disk 0, and DD OS starts with Disk 1.

   Note: The sample output below only includes the alert object and alert message. It does not include the columns for the alert ID, post time, severity, and alert class which are part of the actual output.

```
# alerts show current
sysadmin@localhost# alerts show current
Object                        Message
---------------------------
------------------------------------------------------------------------
Enclosure=1:Disk=4:Cause=NA   EVT-STORAGE-00031: Disk has a hardware fault and may need to
be replaced.
---------------------------
```

```
--------------------------------------------------------------------------------
There are 1 active alerts.
```

3. Match the slot number of the failed disk from the `alerts show current` output to the physical location of the disk.

   Although the physical slots are numbered starting from 0, the software identifies the slots starting at 1.

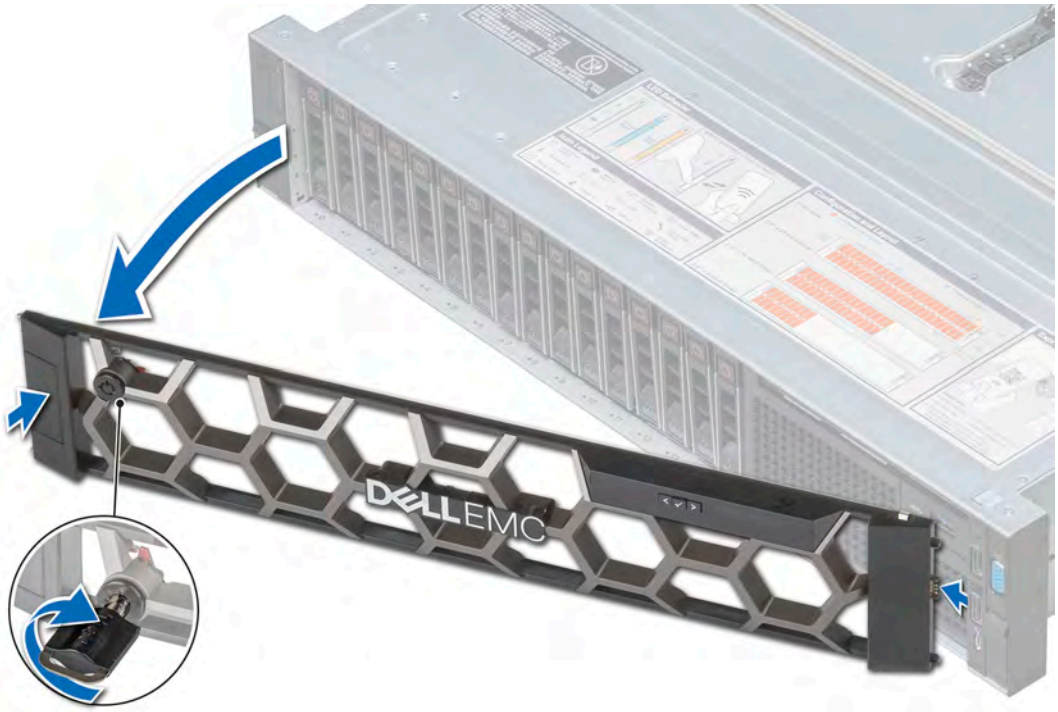
4. Run the `disk beacon` command on the failed disk to illuminate the LED.

Remove the front bezel to access front panel hard drives

Procedure

1. Unlock the bezel by using the bezel key.
2. Press the release button, and pull the left end of the bezel.
3. Unhook the right end, and remove the bezel.

Figure 3 Removing the front bezel



Remove a hard drive

Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. Press the release button to open the hard drive release handle.
2. Holding the handle, slide the hard drive out of the hard drive slot.

Figure 4 Removing a hard drive

3. If you are not replacing the hard drive immediately, insert a hard drive blank in the empty hard drive slot to maintain proper system cooling.

Install the hard drive

Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. Press the release button on the front of the hard drive to open the release handle.
2. Insert the hard drive into the hard drive slot and slide until the hard drive connects with the backplane.
3. Close the hard drive release handle to lock the hard drive in place.

Figure 5 Installing a hard drive

Install the front bezel

Procedure

1. Align and insert the right end of the bezel onto the system.
2. Press the release button and fit the left end of the bezel onto the system.
3. Lock the bezel by using the key.

Figure 6 Installing the front bezel

Verify the replacement drive

About this task

Complete the following tasks to verify the replacement disk.

Procedure

1. Verify the drive fault LED on the left control panel at the front of the system is off.

   Figure 7 Drive fault LED

2. In the DD OS CLI, press `Ctrl + c` to turn off the disk beacon.
3. Run the `disk show hardware` command to verify all the disks appear correctly.
4. Use the `alerts show current` (or `alerts show current-detailed`) command.

```
# alerts show current
No active alerts
```

5. Run the `disk show state` command to verify the disk rebuild status.

CHAPTER 3

Replace a Cache Tier Disk

Complete the following procedure to replace a Cache Tier disk mounted in the front of the chassis.

This CRU can be completed with the system powered on.

Cache Tier disks are not RAID protected, so no disk rebuild is required.

CAUTION This procedure applies to single node systems only. For HA pairs, the Cache Tier disks are located in an FS25 SSD shelf.

Identify a failed Cache Tier disk

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to identify the failed drive.

Procedure

1. Verify the drive fault LED on the left control panel at the front of the system is illuminated solid amber.

   Figure 8 Drive fault LED

2. Run the `alerts show current` command to identify the location of the failed disk. Record the slot number of the failed disk.

   CAUTION The physical labeling of the disks on the system chassis, and the disk numbering in DD OS do not match. The physical labeling starts with Disk 0, and DD OS starts with Disk 1.

   Note: The sample output below only includes the alert object and alert message. It does not include the columns for the alert ID, post time, severity, and alert class which are part of the actual output.

```
# alerts show current
sysadmin@localhost# alerts show current
Object                        Message
---------------------------
------------------------------------------------------------------------
Enclosure=1:Disk=11:Cause=NA   EVT-STORAGE-00031: Disk has a hardware fault and may need
to be replaced.
---------------------------
```

```
--------------------------------------------------------------------------------
There are 1 active alerts.
```

3. Match the slot number of the failed disk from the `alerts show current` output to the physical location of the disk.

   Although the physical slots are numbered starting from 0, the software identifies the slots starting at 1.

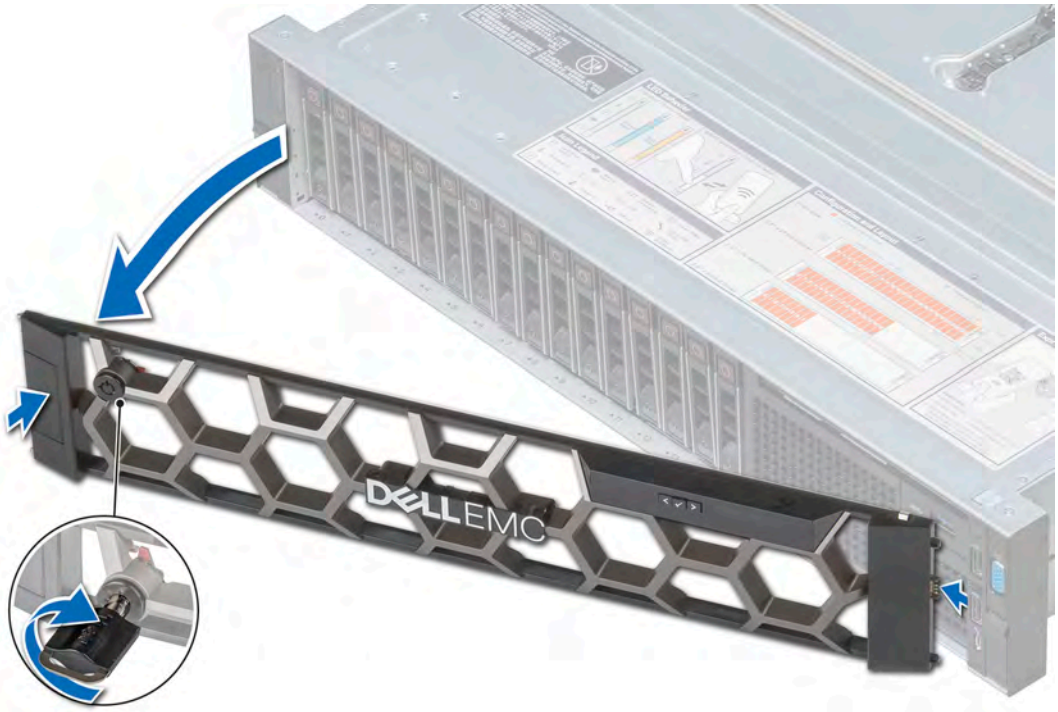
4. Run the `disk beacon` command on the failed disk to illuminate the LED.

Remove the front bezel to access front panel hard drives

Procedure

1. Unlock the bezel by using the bezel key.
2. Press the release button, and pull the left end of the bezel.
3. Unhook the right end, and remove the bezel.

Figure 9 Removing the front bezel



Remove a hard drive

Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. Press the release button to open the hard drive release handle.
2. Holding the handle, slide the hard drive out of the hard drive slot.

Figure 10 Removing a hard drive

3. If you are not replacing the hard drive immediately, insert a hard drive blank in the empty hard drive slot to maintain proper system cooling.

Install the hard drive

Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. Press the release button on the front of the hard drive to open the release handle.
2. Insert the hard drive into the hard drive slot and slide until the hard drive connects with the backplane.
3. Close the hard drive release handle to lock the hard drive in place.

Figure 11 Installing a hard drive

Install the front bezel

Procedure

1. Align and insert the right end of the bezel onto the system.
2. Press the release button and fit the left end of the bezel onto the system.
3. Lock the bezel by using the key.

Figure 12 Installing the front bezel

Verify the replacement drive

About this task

Complete the following tasks to verify the replacement disk.

Procedure

1. Verify the drive fault LED on the left control panel at the front of the system is off.

   Figure 13 Drive fault LED

2. In the DD OS CLI, press `Ctrl + C` to turn off the disk beacon.
3. Run the `disk show hardware` command to verify all the disks appear correctly.
4. Use the `alerts show current` (or `alerts show current-detailed`) command.

   ```
   # alerts show current
   No active alerts
   ```

5. Run the **`storage add tier cache disk 1.<n>`** command to add the disk back to the Cache Tier, where *<n>* is the number of the disk from the hardware failure alert message.

CHAPTER 4

Replace a Fan

The system contains fans in the front of the chassis.

Complete the following procedure to replace a failed fan.

This CRU is not hot-swappable, and requires a system shutdown to replace.

Identify a failed fan

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to identify the failed fan.

Procedure

1. Use the `alerts show current` (or `alerts show current-detailed`) command that will include messages indicating fan loss or fan failure.

   Note: The sample output below only includes the alert object and alert message. It does not include the columns for the alert ID, post time, severity, and alert class which are part of the actual output.

```
# alerts show current
Object               Message
---------            -----------------
Enclosure=1:Fan=3    Fan fault is detected
---------            -----------------
```

2. Use the `enclosure show fans` command to check the status of each fan. Record the failed fan.

```
# enclosure show fans 1
Enclosure   Description   Level    Status
---------   -----------   ------   ------
1           FAN 0         medium   OK
            FAN 1         medium   OK
            FAN 2         medium   OK
            FAN 3         medium   Unavailable
            FAN 4         medium   OK
            FAN 5         medium   OK
---------   -----------   ------   ------
```

3. Map the number of the failed fan to the physical location of that fan.

   The following table shows the physical layout of the fans as seen from the front of the system.

Left fan assembly			Right fan assembly		
Fan 0	Fan 1	Fan 2	Fan 3	Fan 4	Fan5

Shut down and disconnect the system

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to shut down and disconnect the system.

Procedure

1. Stop the system using the `system poweroff` command to allow the proper shut down of the file system and other system components. The power down process takes approximately five minutes to complete. The `system poweroff` command immediately turns the front panel blue LED to amber, and is complete when the front panel LED turns off.

   Note: The system fans still run, and NIC port LEDs still flash after running the `system poweroff` command.

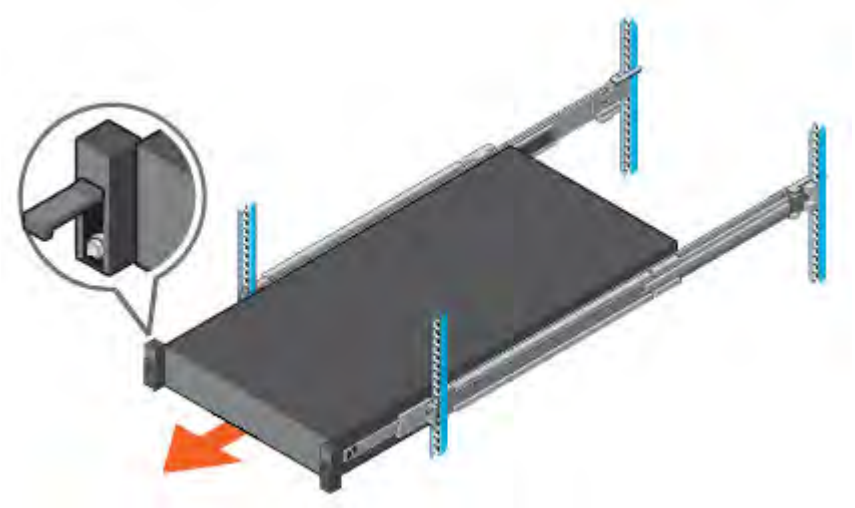
2. Open the cable management arms.
3. Label each of the cables as to their connection location. Taking a photograph for reference is also helpful for re-connecting the cables.
4. Disconnect the AC power cords from the rear of the system.
5. Disconnect all network cables from the rear of the system.
6. Disconnect all SAS cables from the rear of the system.
7. Disconnect the serial console cable.

Extend the system from the cabinet

This procedure is used to extend the system from the cabinet so that the system cover can be removed to access the internal FRU components, or used in removing the system from the cabinet.

Procedure

1. At the front of the cabinet, locate the two slam latches on the left and right sides of the system. Pull the slam latches up to release the system from the cabinet. If the slam latches do not disengage, loosen the screw under each latch.
2. Using the slam latches, pull the system from the cabinet until the rails lock in the extended position.



Remove the system cover

Procedure

1. Using a flat or a Phillips head screwdriver, rotate the latch release lock counter clockwise to the unlocked position.
2. Lift the latch till the system cover slides back and the tabs on the system cover disengage from the guide slots on the system.
3. Hold the cover on both sides, and lift the cover away from the system.

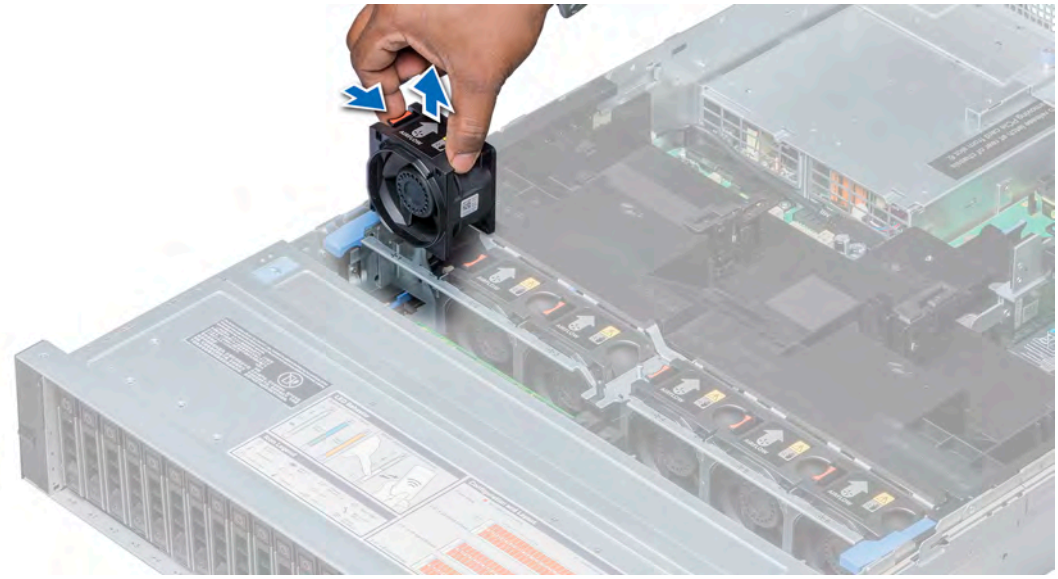
Figure 14 Remove System cover

Remove the cooling fan

Procedure

1. Press the release tab and lift the cooling fan out of the cooling fan assembly.

Figure 15 Removing cooling fan

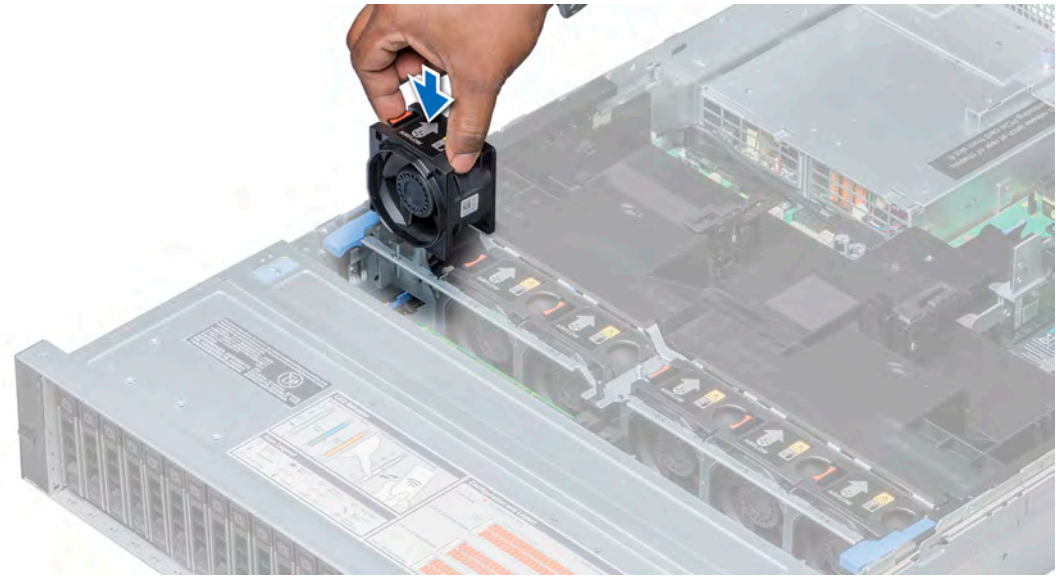


Install the cooling fan

Procedure

1. Holding the release tab, align the connector at the base of the cooling fan with the connector on the system board.

Figure 16 Installing cooling fan



Install the system cover

Procedure

1. Align the tabs on the system cover with the guide slots on the system.
2. Push the system cover latch down.

The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the system cover latch locks into place.

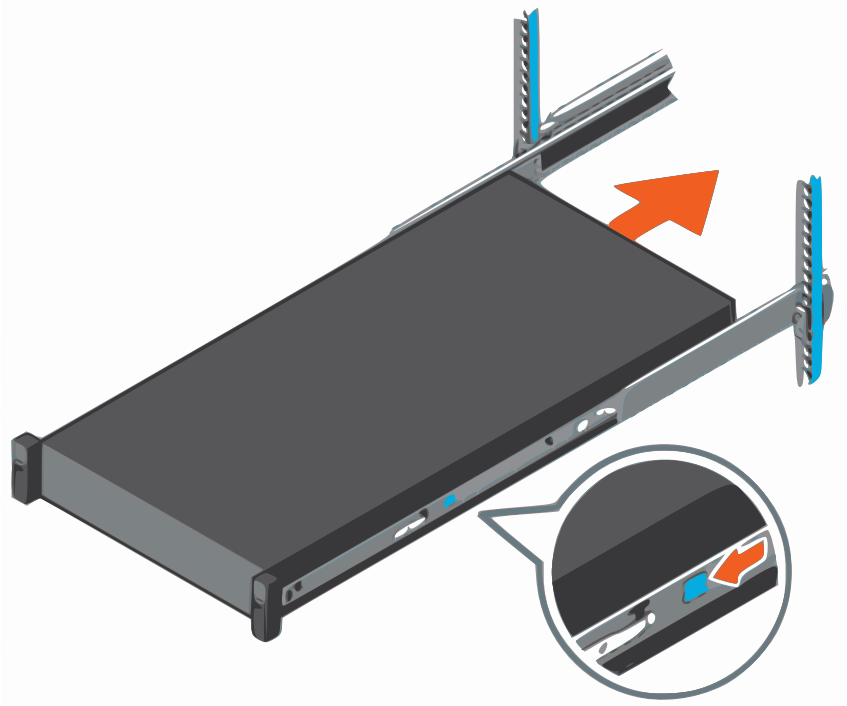
3. Using a flat or Phillips head screwdriver, rotate the latch release lock clockwise to the locked position.

Slide the system into the cabinet

Procedure

1. At the front of the cabinet, push the system inward until the lock levers click into place.
2. Push the blue slide release lock tabs forward on both rails and slide the system into the cabinet. The slam latches will engage to secure the system in the cabinet.

Figure 17 Slide the system into the cabinet



Reconnect and power on the system

About this task

Complete the following steps to reconnect cables, power on the system, and reconnect a terminal session.

Procedure

1. Use the cable labels to reconnect the cables in the same configuration as they were before starting the replacement procedure.
2. Close the cable management arms.
3. Reconnect the serial console cable to the system serial port, and prepare the terminal session.
4. Reconnect the AC power cords to the power supplies.

   Note: The system may not power on automatically after plugging in the AC power cords.

5. If the system does not power on when the AC power cords were reconnected, press the power button on the right control panel at the front of the system.

6. When the system boots, log in as sysadmin.

Verify the replacement fan

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to verify the replacement fan.

Procedure

1. Use the `enclosure show fans` command to check the status of each fan. Record the failed fan.

```
# enclosure show fans 1
Enclosure   Description   Level    Status
---------   -----------   ------   ------
1           FAN 0         medium   OK
            FAN 1         medium   OK
            FAN 2         medium   OK
            FAN 3         medium   OK
            FAN 4         medium   OK
            FAN 5         medium   OK
---------   -----------   ------   ------
```

2. Use the `alerts show current` (or `alerts show current-detailed`) command.

```
# alerts show current
No active alerts
```

CHAPTER 5

Replace a Power Supply

The system contains two power supplies in the rear of the chassis.

Complete the following procedure to replace a failed power supply.

This CRU can be performed with the system powered on.

Identify a failed power supply

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

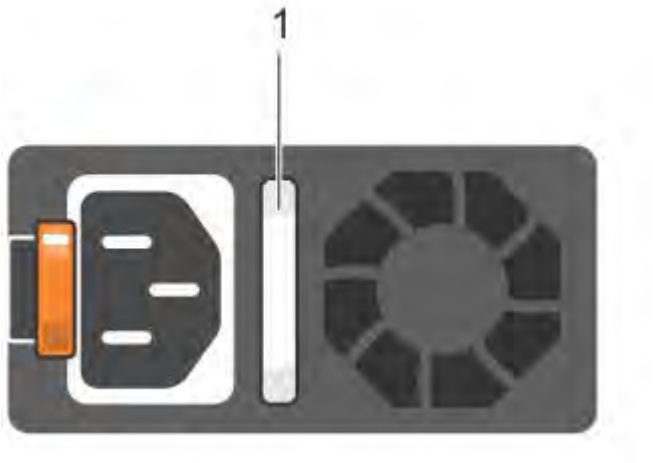
About this task

Complete the following steps to identify the failed power supply.

Procedure

1. Check the LED on the affected power supply unit. The power supply handle functions as the LED.

   Note: If a power supply unit is found to be faulted, the LED blinks amber.



2. Enter the `alerts show current` command (or `alerts show current-detailed`) to display messages indicating power supply failure. A sample output is shown.

   Note: The sample output below only includes the alert object and alert message. It does not include the columns for the alert ID, post time, severity, and alert class which are part of the actual output.

```
# alerts show current
Object               Message
---------            -----------------
Encl=1:PowerSupply=2 EVT-ENVIRONMENT-00026: Power supply has failed
---------            -----------------
```

3. Enter the `enclosure show powersupply` command to check the status of each power supply.

```
# enclosure show powersupply
This command may take up to a minute to complete. Please wait...
---------   -----------   -------   ------
Enclosure   Description      Status
---------   --------------   -------
1           Power module 1   OK
1           Power module 2   FAILED
---------   --------------   -------
```

4. Map the number of the failed PSU to the physical location of that power supply.

   As seen from the back of the system, both power supplies are on the right--hand side of the system. Power supply 1 is the left-hand PSU, and power supply 2 is the right-hand PSU.

Remove a power supply

Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. Disconnect the power cable from the power source and from the PSU you intend to remove, and then remove the cable from the strap on the PSU handle.
2. Press the release latch and slide the PSU out of the system by using the PSU handle.

Install the power supply unit

Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. Verify that nothing has dropped into the empty PSU slot before installing the replacement PSU.
2. Slide the PSU into the system until the PSU is fully seated and the release latch snaps into place.
3. Connect the power cable to the PSU, and plug the cable into a power outlet.

   CAUTION When connecting the power cable to the PSU, secure the cable to the PSU with the strap.

   Note: When installing, hot swapping, or hot adding a new PSU, wait for 15 seconds for the system to recognize the PSU and determine its status. The PSU redundancy may not occur until discovery is complete. Wait until the new PSU is discovered and enabled

before you remove the other PSU. The PSU status indicator turns green to signify that the PSU is functioning properly.

Verify the replacement power supply

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to verify the replacement power supply.

Procedure

1. Enter the `enclosure show powersupply` command to check the status of each power supply.

```
# enclosure show powersupply
This command may take up to a minute to complete. Please wait...
---------   -----------   -------   ------
Enclosure   Description      Status
---------   --------------   -------
1           Power module 1   OK
1           Power module 2   OK
---------   --------------   -------
```

2. Use the `alerts show current` (or `alerts show current-detailed`) command.

```
# alerts show current
No active alerts
```

CHAPTER 6

Replace the Network Daughter Card

The system uses a network daughter card that contains 4 x 10 GbE ports. If a port fails, the whole card requires replacement.

Complete the following procedure to replace the network daughter card.

This CRU is not hot-swappable, and requires a system shutdown to replace.

Verify the status of the network daughter card

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to verify the network daughter card requires replacement.

Procedure

1. Use the `enclosure show io-cards` command to check the status of the network daughter card. If the card has failed, it will not appear in the command output.
2. If the network daughter card is visible in the output of the `enclosure show io-cards` command, use the `alerts show current` command to look for alerts relating to one or more network interfaces that indicate a failure of the network daughter card.
3. Verify the link and activity LEDs on the impacted port are off.

   The network daughter card is located at the rear of the chassis, at the bottom.

   The ports are labeled ethMa, ethMb, ethMc, and ethMd from left to right.

Shut down and disconnect the system

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to shut down and disconnect the system.

Procedure

1. Stop the system using the `system poweroff` command to allow the proper shut down of the file system and other system components. The power down process takes approximately five minutes to complete. The `system poweroff` command immediately turns the front panel blue LED to amber, and is complete when the front panel LED turns off.

   Note: The system fans still run, and NIC port LEDs still flash after running the `system poweroff` command.

2. Open the cable management arms.
3. Label each of the cables as to their connection location. Taking a photograph for reference is also helpful for re-connecting the cables.

4. Disconnect the AC power cords from the rear of the system.
5. Disconnect all network cables from the rear of the system.
6. Disconnect all SAS cables from the rear of the system.
7. Disconnect the serial console cable.

Extend the system from the cabinet

This procedure is used to extend the system from the cabinet so that the system cover can be removed to access the internal FRU components, or used in removing the system from the cabinet.

Procedure

1. At the front of the cabinet, locate the two slam latches on the left and right sides of the system. Pull the slam latches up to release the system from the cabinet. If the slam latches do not disengage, loosen the screw under each latch.
2. Using the slam latches, pull the system from the cabinet until the rails lock in the extended position.

Remove the system cover

Procedure

1. Using a flat or a Phillips head screwdriver, rotate the latch release lock counter clockwise to the unlocked position.
2. Lift the latch till the system cover slides back and the tabs on the system cover disengage from the guide slots on the system.
3. Hold the cover on both sides, and lift the cover away from the system.

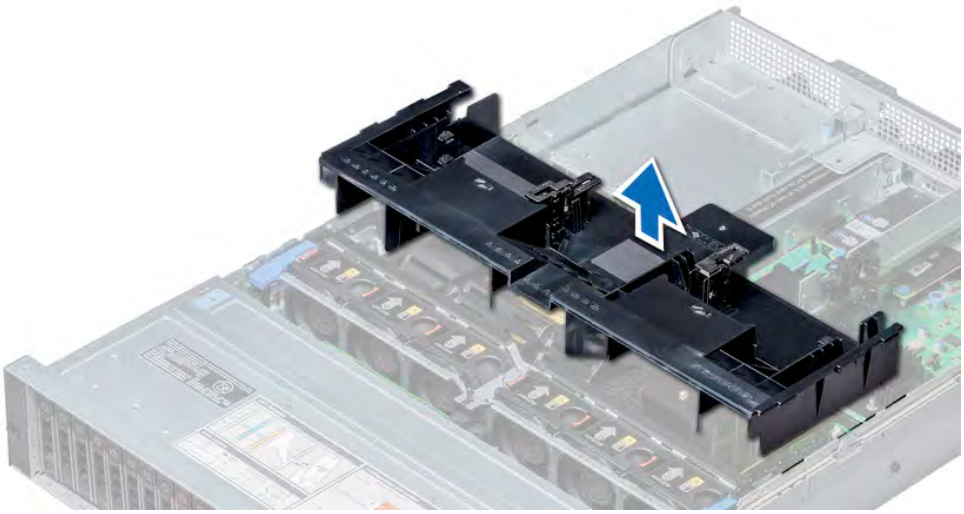
Figure 18 Remove System cover

Removing the air shroud

Procedure

1. Hold the air shroud at both ends and lift it away from the system.

Figure 19 Removing the air shroud



Remove expansion card riser 2

Before you begin

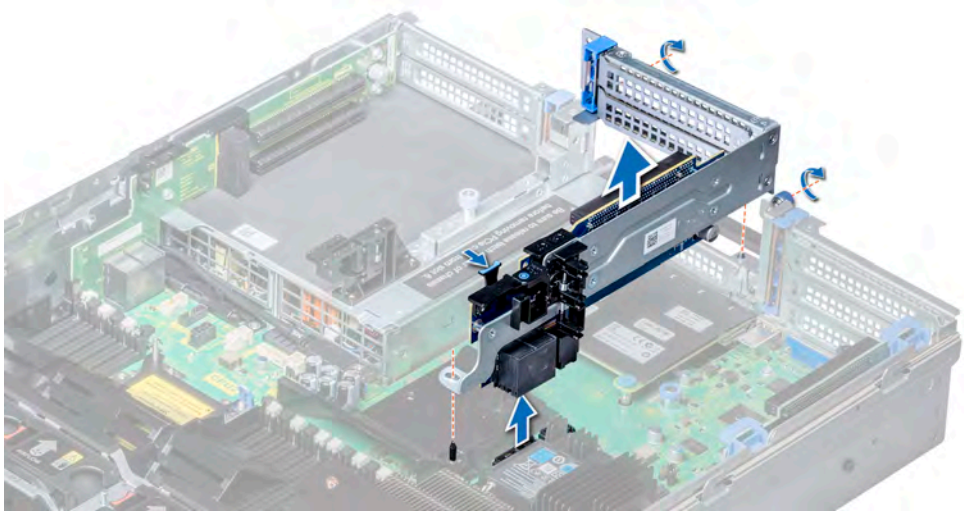
Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. If installed, remove expansion cards installed on the riser.
2. Disconnect any cables connected to the riser.

3. To remove expansion card riser 2:
   a. Using Phillips #2 screwdriver, loosen the screws that secure the riser to the system.
   b. Press the release tab, and holding the riser by its edges, lift the riser from the riser connector on the system board.

Figure 20 Removing expansion card riser 2

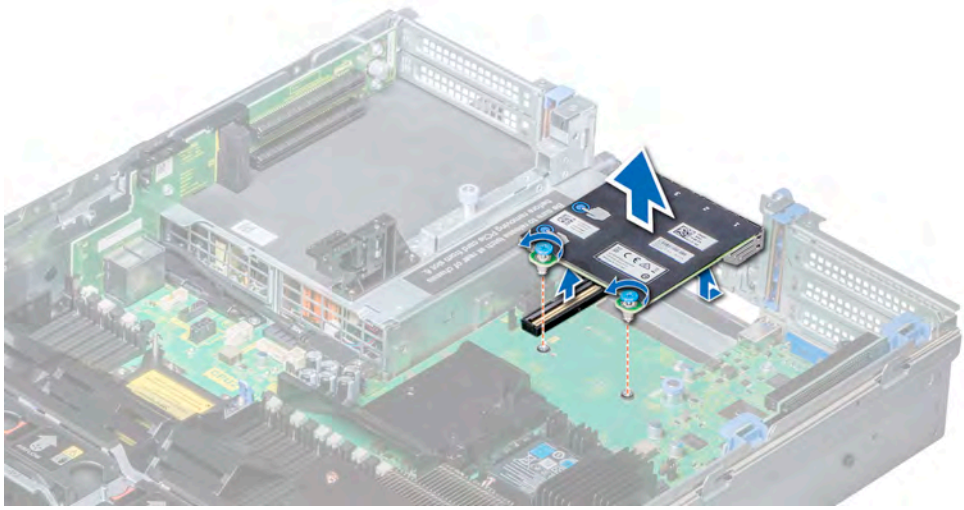


Remove the network daughter card

Procedure

1. Using a Phillips #2 screwdriver, loosen the captive screws that secure the network daughter card (NDC) to the system board.
2. Hold the NDC by the edges on either side of the touch points, and lift to remove it from the connector on the system board.
3. Slide the NDC towards the front of the system until the Ethernet connectors are clear of the slot in the back panel.

Figure 21 Removing the network daughter card

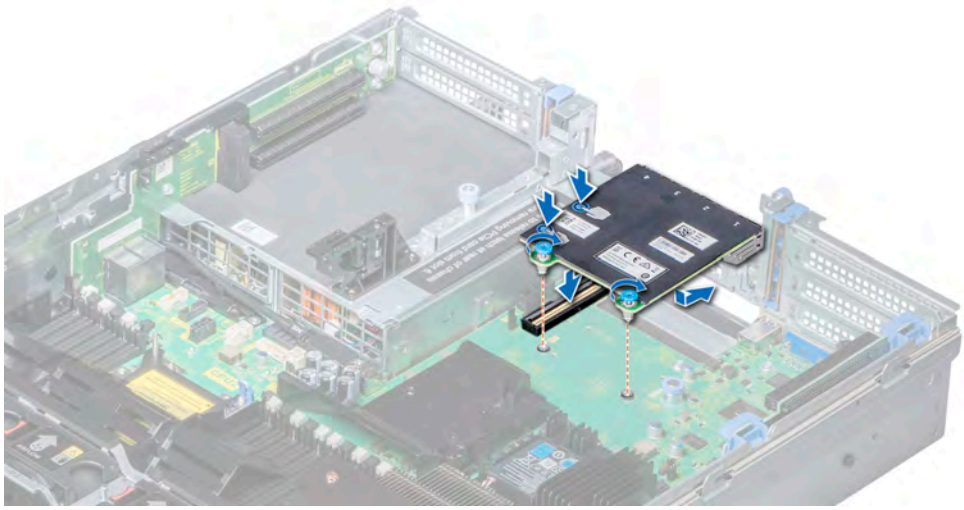


Install the network daughter card

Procedure

1. Orient the NDC so that the Ethernet connectors fit through the slot in the chassis.
2. Align the captive screws at the back-end of the card with the screw holes on the system board.
3. Press the touch points on the card until the card connector is firmly seated on the system board connector.
4. Using a Phillips #2 screwdriver, tighten the captive screws to secure the NDC to the system board.

Figure 22 Installing the network daughter card



Install expansion card riser 2

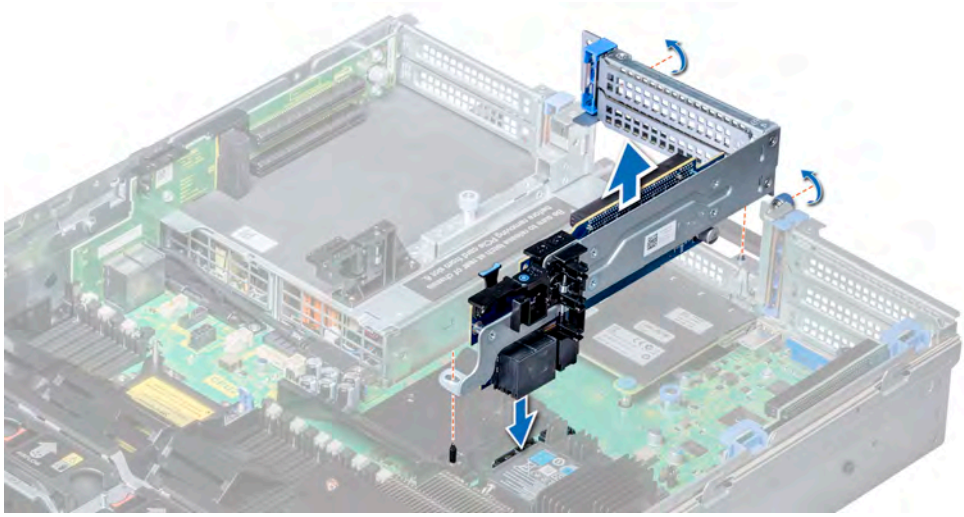
Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. To install expansion card riser 2:
   a. Align the screw and tab on the riser with the screw hole and slot on the system.
   b. Lower the riser into the system until the riser connector engages with the connector on the system board.
   c. Using Phillips #2 screwdriver, tighten the screws to secure the riser to the system.

Figure 23 Installing expansion card riser 2



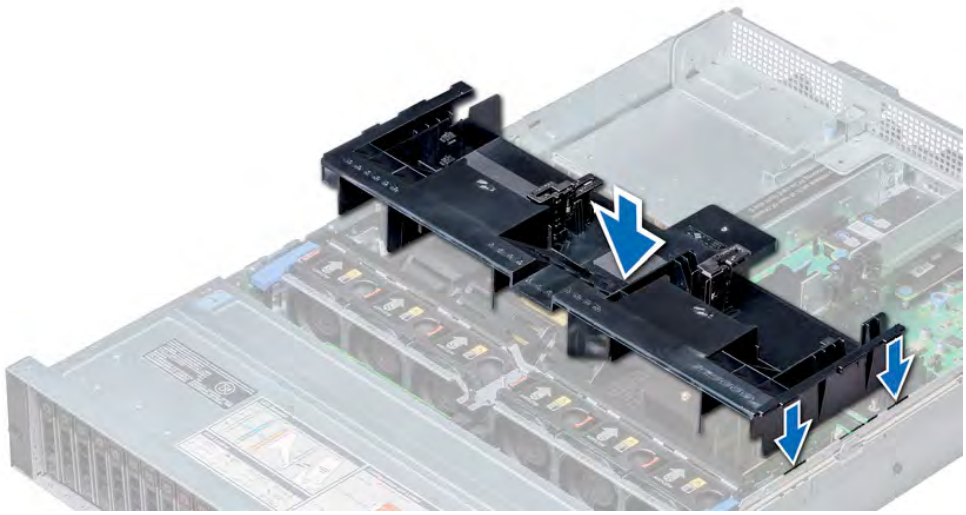
Installing the air shroud

Procedure

1. Align the tabs on the air shroud with the slots on the system.
2. Lower the air shroud into the system until it is firmly seated.

   When firmly seated, the memory socket numbers marked on the air shroud align with the respective memory sockets.

Figure 24 Installing the air shroud



Install the system cover

Procedure

1. Align the tabs on the system cover with the guide slots on the system.
2. Push the system cover latch down.

The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the system cover latch locks into place.

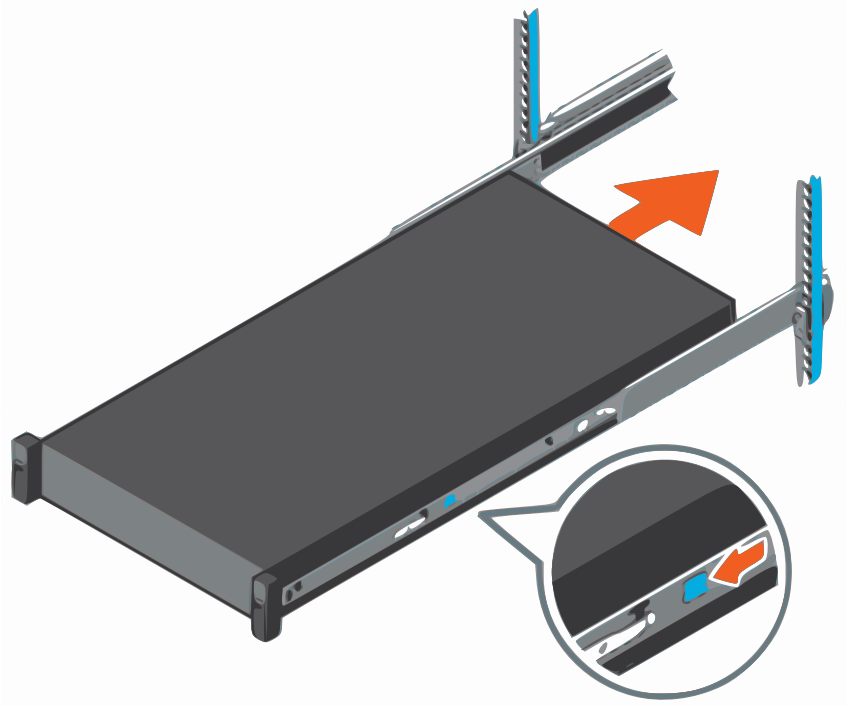
3. Using a flat or Phillips head screwdriver, rotate the latch release lock clockwise to the locked position.

Slide the system into the cabinet

Procedure

1. At the front of the cabinet, push the system inward until the lock levers click into place.
2. Push the blue slide release lock tabs forward on both rails and slide the system into the cabinet. The slam latches will engage to secure the system in the cabinet.

Figure 25 Slide the system into the cabinet



Reconnect and power on the system

About this task

Complete the following steps to reconnect cables, power on the system, and reconnect a terminal session.

Procedure

1. Use the cable labels to reconnect the cables in the same configuration as they were before starting the replacement procedure.
2. Close the cable management arms.
3. Reconnect the serial console cable to the system serial port, and prepare the terminal session.
4. Reconnect the AC power cords to the power supplies.

   Note: The system may not power on automatically after plugging in the AC power cords.

5. If the system does not power on when the AC power cords were reconnected, press the power button on the right control panel at the front of the system.

6. When the system boots, log in as sysadmin.

Verify the replacement network daughter card

About this task

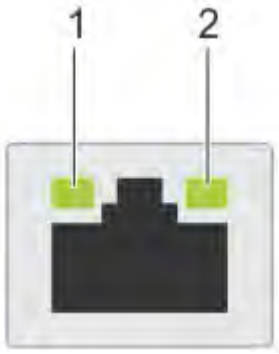
Complete the following steps to verify the operation of the replacement network daughter card.

Procedure

1. Verify the link and activity LEDs on all ports are lit on the active ports.

   The network daughter card is located at the rear of the chassis, at the bottom.

Figure 26 NIC LEDs



1. Link LED indicator
2. Activity LED indicator

The NIC LEDs have the following states:

Table 2 NIC LED states

Link indicator state	Activity indicator state	Meaning
Green	Blinking green	The NIC is connected to a valid network at its maximum port speed and data is being sent or received.
Amber	Blinking green	The NIC is connected to a valid network at less than its maximum port speed and data is being sent or received.
Green	Off	The NIC is connected to a valid network at its maximum port speed and data is not being sent or received.

Table 2 NIC LED states (continued)

Link indicator state	Activity indicator state	Meaning
Amber	Off	The NIC is connected to a valid network at less than its maximum port speed and data is not being sent or received.
Blinking green	Off	NIC identify is enabled through the NIC configuration utility.

2. Use the `enclosure show io-cards` command to check the status of the network daughter card. Verify the network daughter card appears in the list
3. Use the `alerts show current` (or `alerts show current-detailed`) command.

```
# alerts show current
No active alerts
```

CHAPTER 7

Replace a DIMM

The following table lists the memory capacity and the number of DIMMs installed in the system.

Table 3 Memory mapping

Memory capacity	Number of DIMMs
576 GB	12 x 32 GB + 12 x 16 GB

This CRU is not hot-swappable, and requires a system shutdown to replace.

CAUTION If any components are not fully seated, the system may not boot upon completion of the procedure. When installing a component into the system, verify it is fully seated before proceeding to the next step.

Identify a failed DIMM

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to identify a failed DIMM.

Procedure

1. Enter the `alert show current` command to display message indicating a DIMM failure. A sample output is shown.

```
# alert show current
Id  Post Time                Severity  Class       Object  Message
--  ----------------------   --------  --------    ------- ------------------
14  Wed May 3 01:01:18 2017  ALERT   HardwareFailure     EVT-MEM-00002: Memory
                                                         size(512747300KB)
                                                         goes below the configured
                                                         size(529306480KB).
                                                         DDFS will not be started.

# alert show history
```

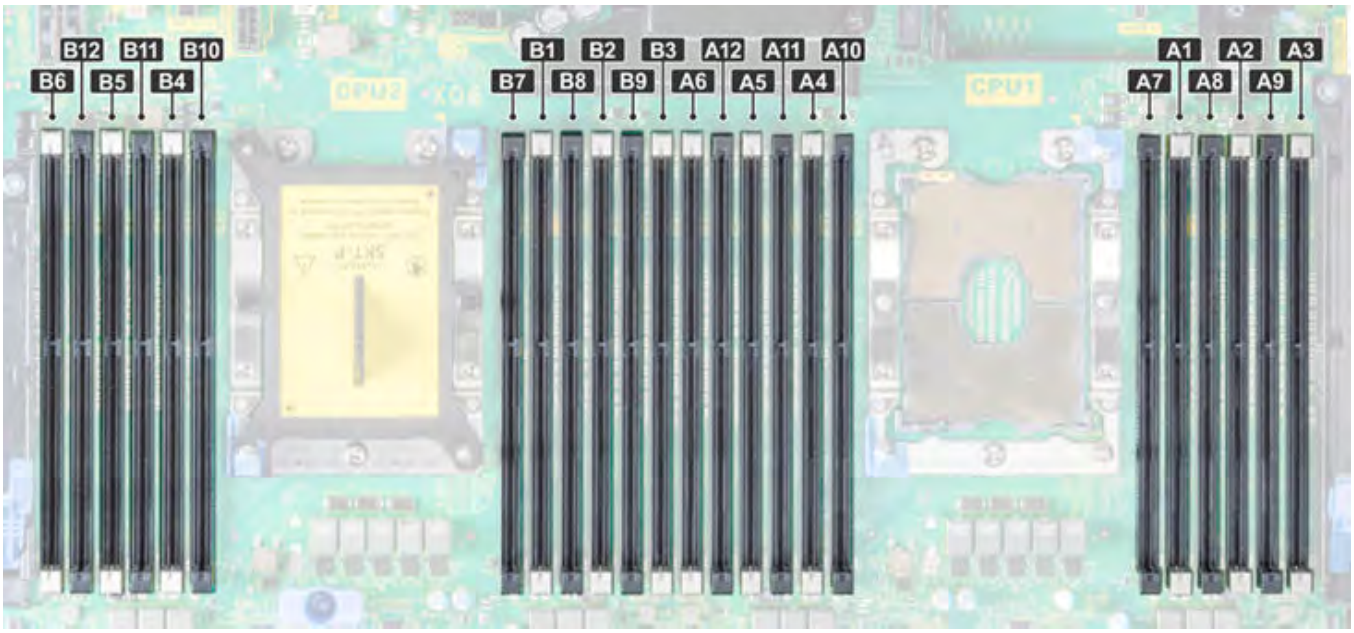
2. Enter the `enclosure show memory` command.

```
# enclosure show memory
Enclosure 1
        Number of DIMMS : 24
        Memory Size: 589824 MiB

        Locator   Speed(MHz)   Size(MiB)   Part No.           Serial No.
        -------   ----------   ---------   ----------------   ----------
        A1        2666         32768       HMA84GR7CJR4N-VK   1202EB82
        A2        2666         32768       HMA84GR7CJR4N-VK   1202ECEB
        A3        2666         32768       HMA84GR7CJR4N-VK   1202ED83
        A4        2666         32768       HMA84GR7CJR4N-VK   1202ED9B
        A5        2666         32768       HMA84GR7CJR4N-VK   1202EBC5
        A6        2666         32768       HMA84GR7CJR4N-VK   1202EC8B
        A7        2666         16384       HMA82GR7AFR8N-VK   42A33A88
        A8        2666         16384       HMA82GR7AFR8N-VK   42A33A4A
        A9        2666         16384       HMA82GR7AFR8N-VK   42A33A54
        A10       2666         16384       HMA82GR7AFR8N-VK   42A33ABD
        A11       2666         16384       HMA82GR7AFR8N-VK   42A33A8A
        A12       2666         16384       HMA82GR7AFR8N-VK   42A33A89
        B1        2666         32768       HMA84GR7CJR4N-VK   1202EC81
        B2        2666         32768       HMA84GR7CJR4N-VK   1202E9E8
        B3        2666         32768       HMA84GR7CJR4N-VK   1202EB54
        B4        2666         32768       HMA84GR7CJR4N-VK   928523CB
        B5        2666         32768       HMA84GR7CJR4N-VK   1202ED03
        B6        2666         32768       HMA84GR7CJR4N-VK   1202ED6D
        B7        2666         16384       HMA82GR7AFR8N-VK   42A33A56
        B8        2666         16384       HMA82GR7AFR8N-VK   42A33A61
        B9        2666         16384       HMA82GR7AFR8N-VK   42A33A6B
        B10       2666         16384       HMA82GR7AFR8N-VK   42A33A6A
        B11       2666         16384       HMA82GR7AFR8N-VK   42A33A63
        B12       2666         16384       HMA82GR7AFR8N-VK   42A33AA5
        -------   ----------   ---------   ----------------   ----------
```

3. Record the failed DIMM information.
4. Identify the physical location of the failed DIMM.

The system has 24 memory slots distributed across six memory channels. The following figure shows the physical layout of the memory slots. The bottom of the image represents the front of the cabinet.



Shut down and disconnect the system

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to shut down and disconnect the system.

Procedure

1. Stop the system using the `system poweroff` command to allow the proper shut down of the file system and other system components. The power down process takes approximately five minutes to complete. The `system poweroff` command immediately turns the front panel blue LED to amber, and is complete when the front panel LED turns off.

   Note: The system fans still run, and NIC port LEDs still flash after running the `system poweroff` command.

2. Open the cable management arms.
3. Label each of the cables as to their connection location. Taking a photograph for reference is also helpful for re-connecting the cables.
4. Disconnect the AC power cords from the rear of the system.
5. Disconnect all network cables from the rear of the system.
6. Disconnect all SAS cables from the rear of the system.
7. Disconnect the serial console cable.

Extend the system from the cabinet

This procedure is used to extend the system from the cabinet so that the system cover can be removed to access the internal FRU components, or used in removing the system from the cabinet.

Procedure

1. At the front of the cabinet, locate the two slam latches on the left and right sides of the system. Pull the slam latches up to release the system from the cabinet. If the slam latches do not disengage, loosen the screw under each latch.
2. Using the slam latches, pull the system from the cabinet until the rails lock in the extended position.

Remove the system cover

Procedure

1. Using a flat or a Phillips head screwdriver, rotate the latch release lock counter clockwise to the unlocked position.
2. Lift the latch till the system cover slides back and the tabs on the system cover disengage from the guide slots on the system.
3. Hold the cover on both sides, and lift the cover away from the system.

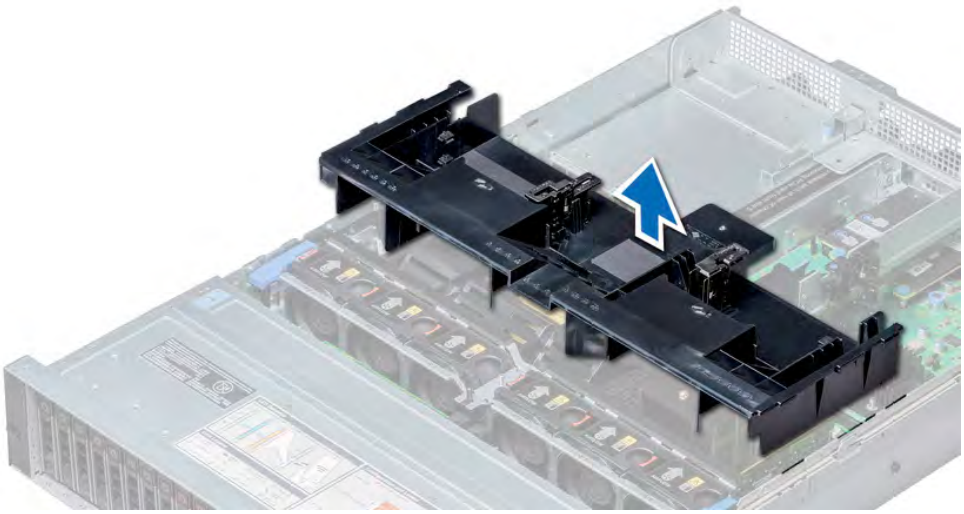
Figure 27 Remove System cover

Removing the air shroud

Procedure

1. Hold the air shroud at both ends and lift it away from the system.

Figure 28 Removing the air shroud



Remove the memory module

Before you begin

WARNING Allow the memory modules to cool after you power off the system. Handle the memory modules by the card edges and avoid touching the components or metallic contacts on the memory module.

CAUTION To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. Remove memory module blanks only if you intend to install memory modules in those sockets.

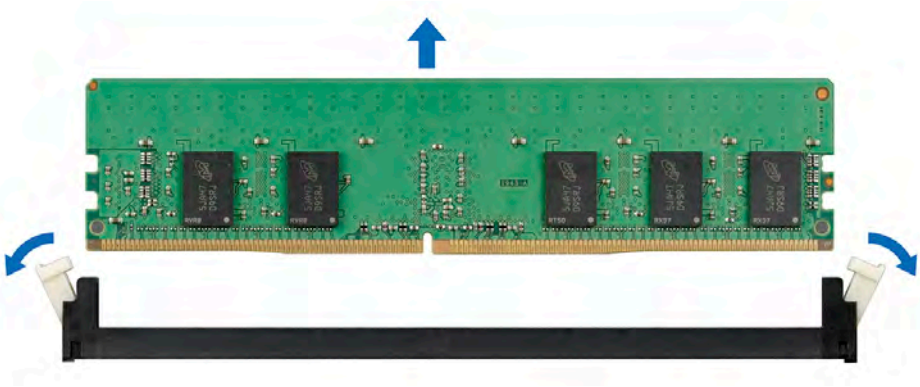
Procedure

1. Locate the appropriate memory module socket.

   CAUTION Handle each memory module only by the card edges, ensuring not to touch the middle of the memory module or metallic contacts.

2. Push the ejectors outward on both ends of the memory module socket to release the memory module from the socket.
3. Lift and remove the memory module from the system.

Figure 29 Removing a memory module



Install the memory module

Before you begin

CAUTION To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. Remove memory module blanks only if you intend to install memory modules in those sockets.

Procedure

1. Locate the appropriate memory module socket.

   CAUTION Handle each memory module only by the card edges, ensuring not to touch the middle of the memory module or metallic contacts.

   CAUTION To prevent damage to the memory module or the memory module socket during installation, do not bend or flex the memory module. You must insert both ends of the memory module simultaneously.

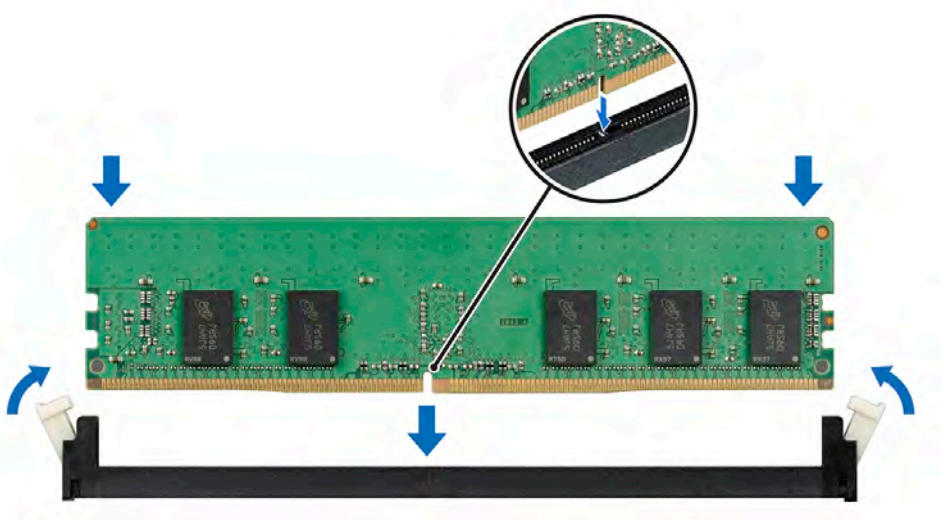
2. Open the ejectors on the memory module socket outward to allow the memory module to be inserted into the socket.
3. Align the edge connector of the memory module with the alignment key of the memory module socket, and insert the memory module in the socket.

   CAUTION Do not apply pressure at the center of the memory module; apply pressure at both ends of the memory module evenly.

Note: The memory module socket has an alignment key that enables you to install the memory module in the socket in only one orientation.

4. Press the memory module with your thumbs until the socket levers firmly click into place.

Figure 30 Installing a memory module



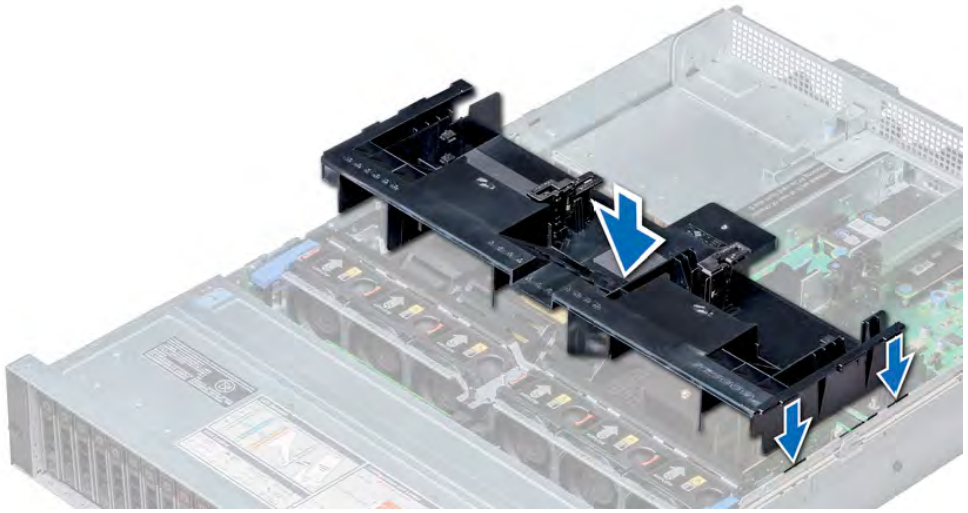
Installing the air shroud

Procedure

1. Align the tabs on the air shroud with the slots on the system.
2. Lower the air shroud into the system until it is firmly seated.

   When firmly seated, the memory socket numbers marked on the air shroud align with the respective memory sockets.

Figure 31 Installing the air shroud



Install the system cover

Procedure

1. Align the tabs on the system cover with the guide slots on the system.
2. Push the system cover latch down.

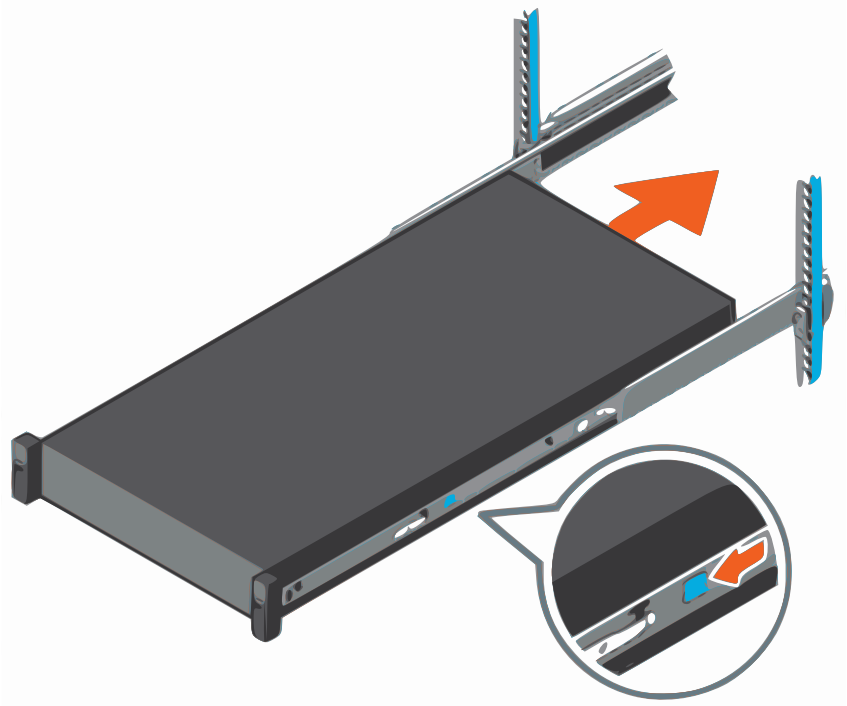
   The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the system cover latch locks into place.
3. Using a flat or Phillips head screwdriver, rotate the latch release lock clockwise to the locked position.

Slide the system into the cabinet

Procedure

1. At the front of the cabinet, push the system inward until the lock levers click into place.
2. Push the blue slide release lock tabs forward on both rails and slide the system into the cabinet. The slam latches will engage to secure the system in the cabinet.

Figure 32 Slide the system into the cabinet



Reconnect and power on the system

About this task

Complete the following steps to reconnect cables, power on the system, and reconnect a terminal session.

Procedure

1. Use the cable labels to reconnect the cables in the same configuration as they were before starting the replacement procedure.
2. Close the cable management arms.
3. Reconnect the serial console cable to the system serial port, and prepare the terminal session.
4. Reconnect the AC power cords to the power supplies.

   Note: The system may not power on automatically after plugging in the AC power cords.

5. If the system does not power on when the AC power cords were reconnected, press the power button on the right control panel at the front of the system.

6. When the system boots, log in as sysadmin.

Verify the replacement DIMM

About this task

Complete the following steps to verify the replacement DIMM.

Procedure

1. Enter the `system show meminfo` command to see the top level summary. Confirm that the system reports the correct amount of memory.
2. Enter the `enclosure show memory` command to verify all DIMMs are discovered.

```
# enclosure show memory
Enclosure 1
        Number of DIMMS : 24
        Memory Size: 549316 MiB

        Locator    Speed(MHz)   Size(MiB)
        -------    ----------   ---------
        DIMM A1    2666 MHz     32768 MB
        DIMM A2    2666 MHz     16384 MB
        DIMM A3    2666 MHz     32768 MB
        DIMM A4    2666 MHz     16384 MB
        DIMM A5    2666 MHz     32768 MB
        DIMM A6    2666 MHz     16384 MB
        DIMM A7    2666 MHz     16384 MB
        DIMM A8    2666 MHz     32768 MB
        DIMM A9    2666 MHz     16384 MB
        DIMM A10   2666 MHz     32768 MB
        DIMM A11   2666 MHz     16384 MB
        DIMM A12   2666 MHz     32768 MB
        DIMM B1    2666 MHz     32768 MB
        DIMM B2    2666 MHz     16384 MB
        DIMM B3    2666 MHz     32768 MB
        DIMM B4    2666 MHz     16384 MB
        DIMM B5    2666 MHz     32768 MB
        DIMM B6    2666 MHz     16384 MB
        DIMM B7    2666 MHz     16384 MB
        DIMM B8    2666 MHz     32768 MB
        DIMM B9    2666 MHz     16384 MB
        DIMM B10   2666 MHz     32768 MB
        DIMM B11   2666 MHz     16384 MB
        DIMM B12   2666 MHz     32768 MB
        -------    ----------   ---------
```

3. Check for any new DIMM alerts.

CHAPTER 8

Replace a PCIe HBA

The system uses a variety of PCIe HBAs to provide network, FC, or storage connectivity. If a port fails, the whole card requires replacement.

Complete the following procedure to replace an HBA.

This CRU is not hot-swappable, and requires a system shutdown to replace.

Identify the failed PCIe HBA

Procedure

1. Enter the `alerts show current` or `alerts show current-detailed` command to display messages indicating I/O failure. A sample output is shown.

```
# alerts show current
Id Post Time                Severity Class     Object     Message
-- ----------------------- -------- --------- -------- ---------------
1  Mon May 6 18:57:00 2019  WARNING HWFailure Enclosure=1:EVT-ENVIRONMENT-00049:
                                                        The system detected an
                                                        invalid hardware
                                                        configuration.
```

2. Enter the `enclosure show io-cards` command to check the status of each I/O. Record the failed I/O. A sample output is shown.

Shut down and disconnect the system

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to shut down and disconnect the system.

Procedure

1. Stop the system using the `system poweroff` command to allow the proper shut down of the file system and other system components. The power down process takes approximately five minutes to complete. The `system poweroff` command immediately turns the front panel blue LED to amber, and is complete when the front panel LED turns off.

   Note: The system fans still run, and NIC port LEDs still flash after running the `system poweroff` command.

2. Open the cable management arms.
3. Label each of the cables as to their connection location. Taking a photograph for reference is also helpful for re-connecting the cables.
4. Disconnect the AC power cords from the rear of the system.
5. Disconnect all network cables from the rear of the system.
6. Disconnect all SAS cables from the rear of the system.
7. Disconnect the serial console cable.

Extend the system from the cabinet

This procedure is used to extend the system from the cabinet so that the system cover can be removed to access the internal FRU components, or used in removing the system from the cabinet.

Procedure

1. At the front of the cabinet, locate the two slam latches on the left and right sides of the system. Pull the slam latches up to release the system from the cabinet. If the slam latches do not disengage, loosen the screw under each latch.
2. Using the slam latches, pull the system from the cabinet until the rails lock in the extended position.

Remove the system cover

Procedure

1. Using a flat or a Phillips head screwdriver, rotate the latch release lock counter clockwise to the unlocked position.
2. Lift the latch till the system cover slides back and the tabs on the system cover disengage from the guide slots on the system.
3. Hold the cover on both sides, and lift the cover away from the system.

Figure 33 Remove System cover

Remove an expansion card from an expansion card riser

Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

About this task

Note: This procedure describes and illustrate expansion card removal from each type of expansion card riser. Refer to the applicable illustration to aid in removal of the expansion card from the expansion card riser.

Note: When removing an expansion card from riser 2 or 3, ensure that the PCIe card holder latch is closed.

Procedure

1. If applicable, disconnect the cables from the expansion card.
2. Hold the expansion card by its edges, and pull the card until the card edge connector disengages from the expansion card connector on the riser.

Figure 34 Removing the expansion card from expansion card riser 1

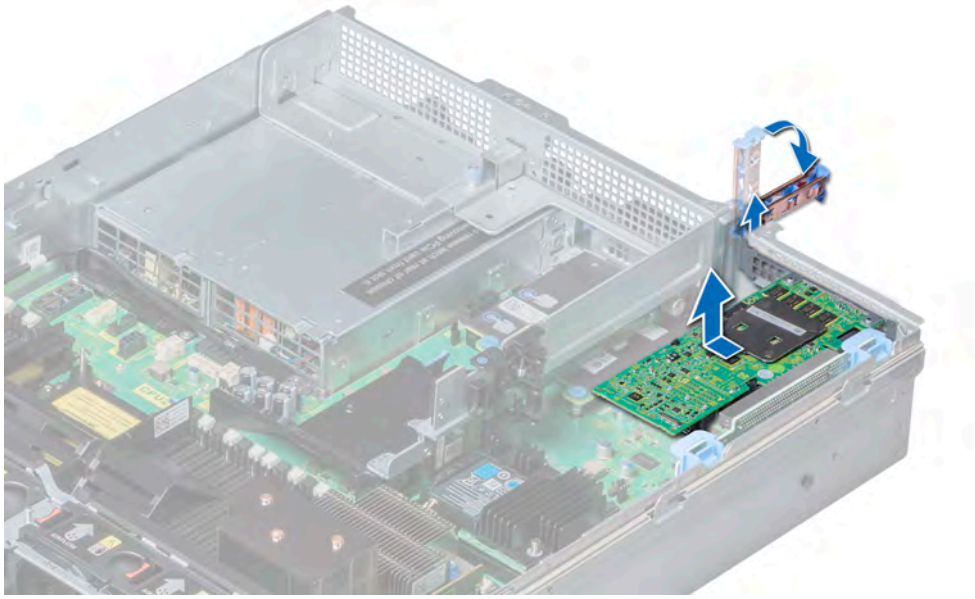


Figure 35 Removing the expansion card from expansion card riser 2

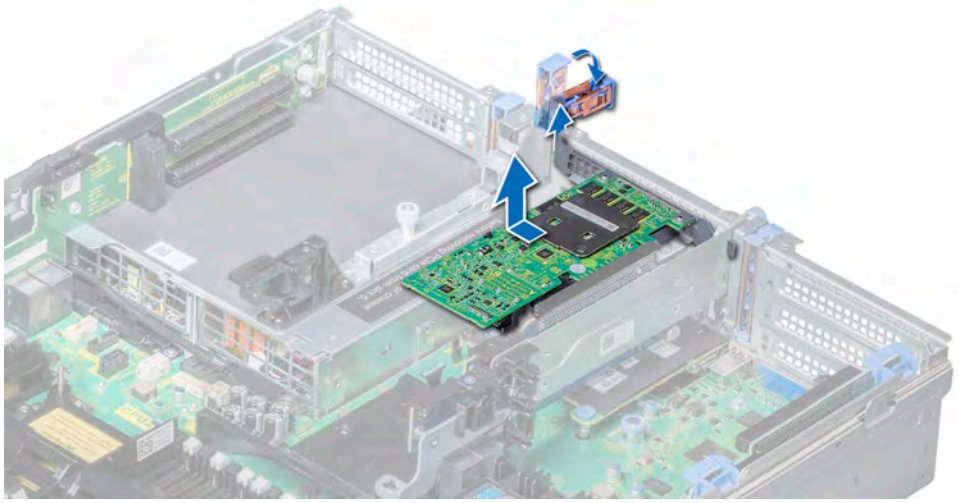
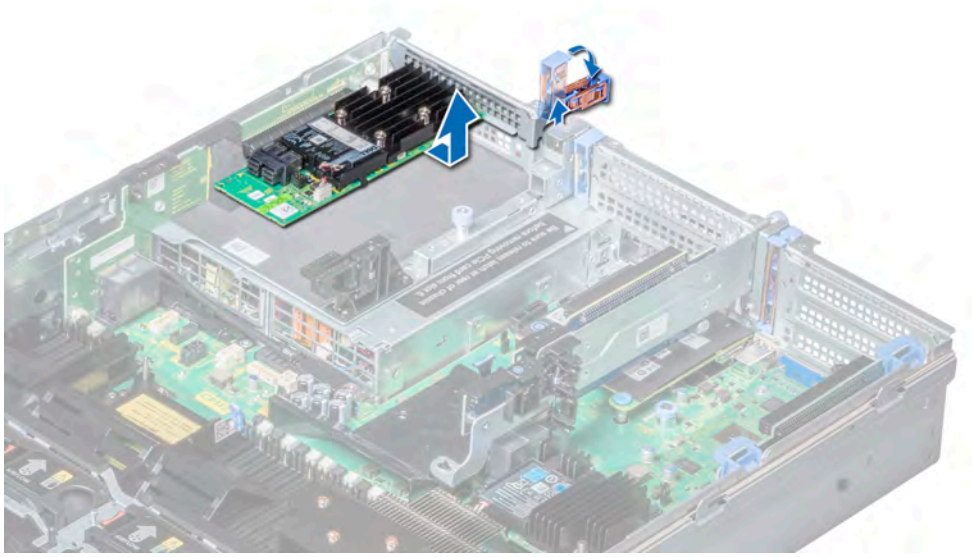


Figure 36 Removing the expansion card from expansion card riser 3



Install expansion card into expansion card riser

Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

About this task

Note: When installing a card into riser 2 or 3, open the PCIe card holder latch.

Procedure

1. Pull the expansion card latch.
2. If installed, remove the filler bracket.

   Note: Store the filler bracket for future use. Filler brackets must be installed in empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

3. Hold the card by its edges, and align the card edge connector with the expansion card connector on the riser.
4. Insert the card edge connector firmly into the expansion card connector until the card is fully seated.
5. Push the expansion card latch.

Figure 37 Installing expansion card into expansion card riser 1

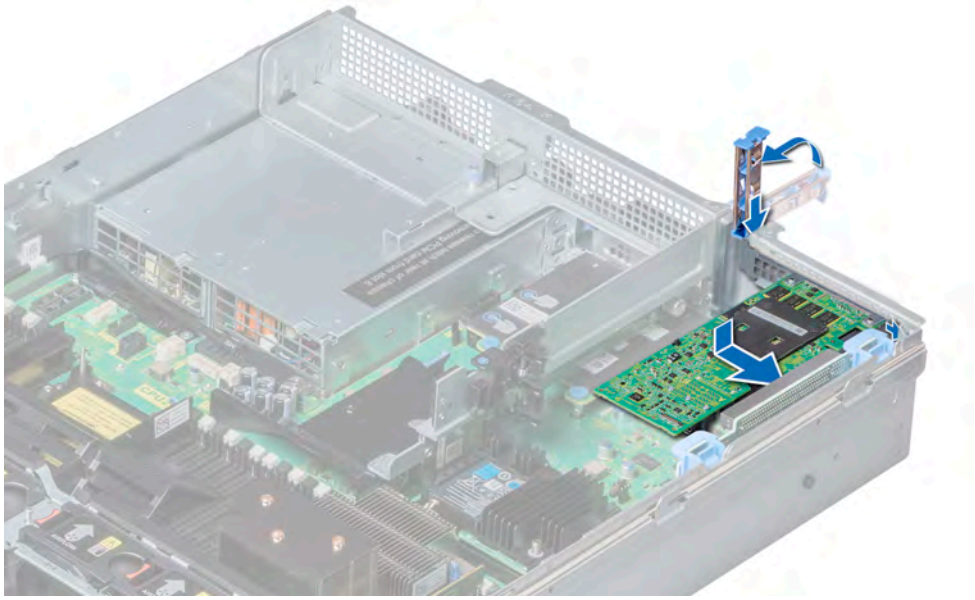


Figure 38 Installing expansion card into expansion card riser 2

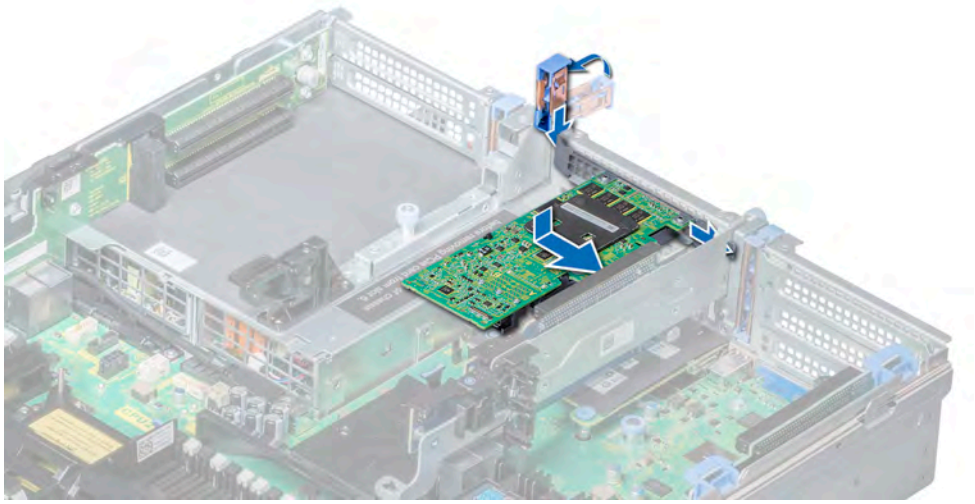
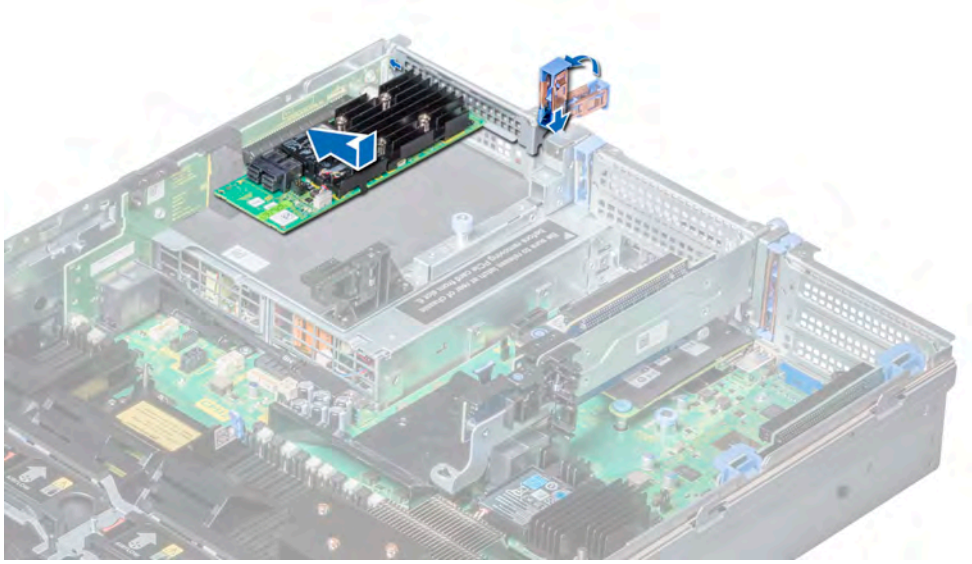


Figure 39 Installing expansion card into expansion card riser 3



Install the system cover

Procedure

1. Align the tabs on the system cover with the guide slots on the system.
2. Push the system cover latch down.

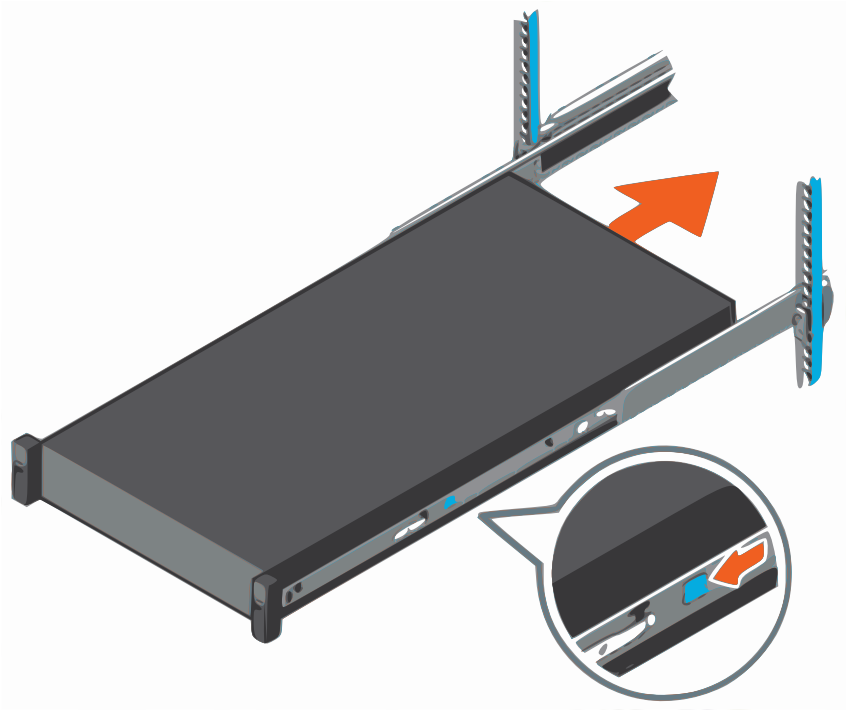
   The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the system cover latch locks into place.
3. Using a flat or Phillips head screwdriver, rotate the latch release lock clockwise to the locked position.

Slide the system into the cabinet

Procedure

1. At the front of the cabinet, push the system inward until the lock levers click into place.
2. Push the blue slide release lock tabs forward on both rails and slide the system into the cabinet. The slam latches will engage to secure the system in the cabinet.

Figure 40 Slide the system into the cabinet



Reconnect and power on the system

About this task

Complete the following steps to reconnect cables, power on the system, and reconnect a terminal session.

Procedure

1. Use the cable labels to reconnect the cables in the same configuration as they were before starting the replacement procedure.
2. Close the cable management arms.
3. Reconnect the serial console cable to the system serial port, and prepare the terminal session.
4. Reconnect the AC power cords to the power supplies.

   Note: The system may not power on automatically after plugging in the AC power cords.

5. If the system does not power on when the AC power cords were reconnected, press the power button on the right control panel at the front of the system.

6. When the system boots, log in as sysadmin.

Verify the PCIe HBA replacement

Procedure

1. Use the `alerts show current` command and confirm that the system has cleared the alert for the failed I/O module. It may take one to two minutes after the I/O module replacement before the system clears the alert.

```
# alerts show current
No active alerts.
```

2. Use the `system show hardware` command and confirm that all PCIe HBAs appear.

```
# system show hardware
```

3. Run activity on the new HBA to verify it functions as expected.

CHAPTER 9

Replace the Trusted Platform Module (TPM)

The PowerProtect system uses a TPM to secure the system.

Complete the following procedure to replace the TPM.

This FRU is not hot-swappable, and requires a system shutdown to replace.

Verify the status of the TPM

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to verify the TPM replacement.

Procedure

1. Run the `system show all` command, and look for the line indicating the TPM. If it is not present, the TPM requires replacement:

   ```
   TPM device: Nuvoton chip for Rest of World
   ```

Shut down and disconnect the system

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to shut down and disconnect the system.

Procedure

1. Stop the system using the `system poweroff` command to allow the proper shut down of the file system and other system components. The power down process takes approximately five minutes to complete. The `system poweroff` command immediately turns the front panel blue LED to amber, and is complete when the front panel LED turns off.

   Note: The system fans still run, and NIC port LEDs still flash after running the `system poweroff` command.

2. Open the cable management arms.
3. Label each of the cables as to their connection location. Taking a photograph for reference is also helpful for re-connecting the cables.
4. Disconnect the AC power cords from the rear of the system.
5. Disconnect all network cables from the rear of the system.
6. Disconnect all SAS cables from the rear of the system.
7. Disconnect the serial console cable.

Extend the system from the cabinet

This procedure is used to extend the system from the cabinet so that the system cover can be removed to access the internal FRU components, or used in removing the system from the cabinet.

Procedure

1. At the front of the cabinet, locate the two slam latches on the left and right sides of the system. Pull the slam latches up to release the system from the cabinet. If the slam latches do not disengage, loosen the screw under each latch.
2. Using the slam latches, pull the system from the cabinet until the rails lock in the extended position.

Remove the system cover

Procedure

1. Using a flat or a Phillips head screwdriver, rotate the latch release lock counter clockwise to the unlocked position.
2. Lift the latch till the system cover slides back and the tabs on the system cover disengage from the guide slots on the system.
3. Hold the cover on both sides, and lift the cover away from the system.

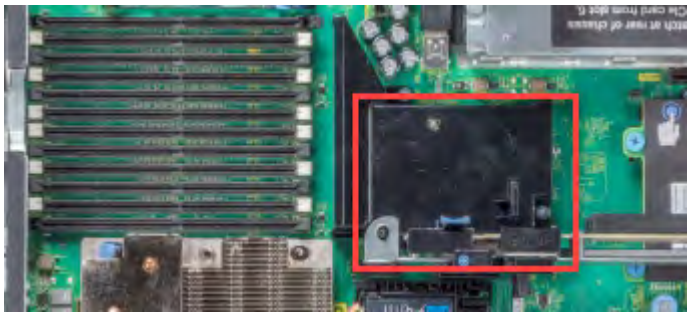
Figure 41 Remove System cover

Locate the TPM

About this task

The TPM is connected to the system board, behind the DIMMs and in front of PCIe riser 2 as shown in the following image:

Figure 42 TPM location



Upgrading the Trusted Platform Module

About this task

CAUTION If you are using the Trusted Platform Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Work with the customer to create and safely store this recovery key. When replacing this system board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your hard drives.

CAUTION Once the TPM plug-in module is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, the removed TPM cannot be reinstalled or installed on another system board.

Removing the TPM

Procedure

1. Locate the TPM connector on the system board.
2. Press to hold the module down and remove the screw using the security Torx 8-bit shipped with the TPM module.
3. Slide the TPM module out from its connector.
4. Push the plastic rivet away from the TPM connector and rotate it 90° counterclockwise to release it from the system board.
5. Pull the plastic rivet out of its slot on the system board.

Installing the TPM

Procedure

1. To install the TPM, align the edge connectors on the TPM with the slot on the TPM connector.
2. Insert the TPM into the TPM connector such that the plastic rivet aligns with the slot on the system board.
3. Press the plastic rivet until the rivet snaps into place.

Figure 43 Installing the TPM

After you finish

1. Install the system board.

Install the system cover

Procedure

1. Align the tabs on the system cover with the guide slots on the system.
2. Push the system cover latch down.

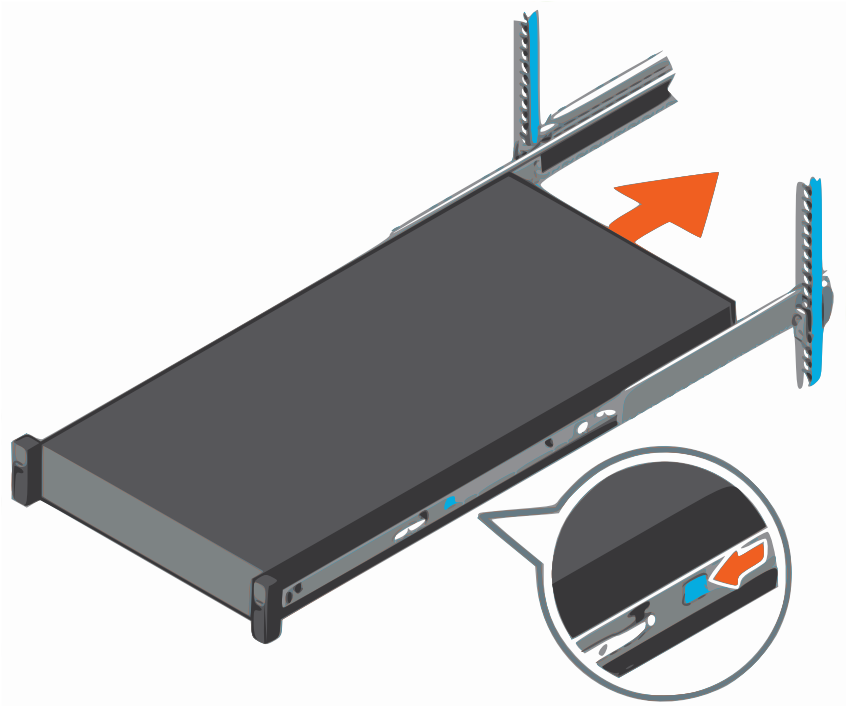
   The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the system cover latch locks into place.
3. Using a flat or Phillips head screwdriver, rotate the latch release lock clockwise to the locked position.

Slide the system into the cabinet

Procedure

1. At the front of the cabinet, push the system inward until the lock levers click into place.
2. Push the blue slide release lock tabs forward on both rails and slide the system into the cabinet. The slam latches will engage to secure the system in the cabinet.

Figure 44 Slide the system into the cabinet



Reconnect and power on the system

About this task

Complete the following steps to reconnect cables, power on the system, and reconnect a terminal session.

Procedure

1. Use the cable labels to reconnect the cables in the same configuration as they were before starting the replacement procedure.
2. Close the cable management arms.
3. Reconnect the serial console cable to the system serial port, and prepare the terminal session.
4. Reconnect the AC power cords to the power supplies.

   Note: The system may not power on automatically after plugging in the AC power cords.

5. If the system does not power on when the AC power cords were reconnected, press the power button on the right control panel at the front of the system.

6. When the system boots, log in as sysadmin.

Initializing TPM for BitLocker users

Procedure

1. Initialize the TPM.

   For more information, see https://technet.microsoft.com/en-us/library/cc753140.aspx.

   The **TPM Status** changes to **Enabled, Activated**.

Initializing the TPM 1.2 for TXT users

Procedure

1. While booting your system, press F2 to enter System Setup.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
3. From the **TPM Security** option, select **On with Pre-boot Measurements**.
4. From the **TPM Command** option, select **Activate**.
5. Save the settings.
6. Restart your system.
7. Enter **System Setup** again.

8. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
9. From the **Intel TXT** option, select **On**.

Initializing the TPM 2.0 for TXT users

Procedure

1. While booting your system, press F2 to enter System Setup.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
3. From the **TPM Security** option, select **On**.
4. Save the settings.
5. Restart your system.
6. Enter **System Setup** again.
7. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
8. Select the **TPM Advanced Settings** option.
9. From the **TPM2 Algorithm Selection** option, select **SHA256**, then go back to **System Security Settings** screen.
10. On the **System Security Settings** screen, from the **Intel TXT** option, select **On**.
11. Save the settings.
12. Restart your system.

CHAPTER 10

Replace the HBA330 SAS Controller

The system uses an HBA330 SAS controller card .

Complete the following procedure to replace the HBA330.

This CRU is not hot-swappable, and requires a system shutdown to replace.

Verify the status of the HBA330

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to verify the HBA330.

Note: The DD OS software lists the HBA330 as `PERC1 Dell Storage Cntlr.12GB-SASHBA`

Procedure

1. Run the `disk show hardware` command, and if any of the following disks are not reported, the HBA 330 requires replacement:

```
# disk show hardware
Disk          Slot   Manufacturer/Model          Firmware   Serial No.       Capacity
Type
(enc/
disk)
-----------   ----   -------------------------   --------   --------------   --------
-------
1.1           0      SAMSUNG MZILT1T9HAJQ0D3     DSF8       S40DNF0K906928   1.7 TiB    SAS-
SSD
1.2           1      SAMSUNG MZILT1T9HAJQ0D3     DSF8       S40DNF0K906926   1.7 TiB    SAS-
SSD
1.3           2      SAMSUNG MZILT1T9HAJQ0D3     DSF8       S40DNF0K906902   1.7 TiB    SAS-
SSD
1.4           3      SAMSUNG MZILT1T9HAJQ0D3     DSF8       S40DNF0K906904   1.7 TiB    SAS-
SSD
```

Shut down and disconnect the system

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to shut down and disconnect the system.

Procedure

1. Stop the system using the `system poweroff` command to allow the proper shut down of the file system and other system components. The power down process takes approximately five minutes to complete. The `system poweroff` command immediately turns the front panel blue LED to amber, and is complete when the front panel LED turns off.

   Note: The system fans still run, and NIC port LEDs still flash after running the `system poweroff` command.

2. Open the cable management arms.
3. Label each of the cables as to their connection location. Taking a photograph for reference is also helpful for re-connecting the cables.

4. Disconnect the AC power cords from the rear of the system.
5. Disconnect all network cables from the rear of the system.
6. Disconnect all SAS cables from the rear of the system.
7. Disconnect the serial console cable.

Extend the system from the cabinet

This procedure is used to extend the system from the cabinet so that the system cover can be removed to access the internal FRU components, or used in removing the system from the cabinet.

Procedure

1. At the front of the cabinet, locate the two slam latches on the left and right sides of the system. Pull the slam latches up to release the system from the cabinet. If the slam latches do not disengage, loosen the screw under each latch.
2. Using the slam latches, pull the system from the cabinet until the rails lock in the extended position.

Remove the system cover

Procedure

1. Using a flat or a Phillips head screwdriver, rotate the latch release lock counter clockwise to the unlocked position.
2. Lift the latch till the system cover slides back and the tabs on the system cover disengage from the guide slots on the system.
3. Hold the cover on both sides, and lift the cover away from the system.

Figure 45 Remove System cover

Remove expansion card riser 1

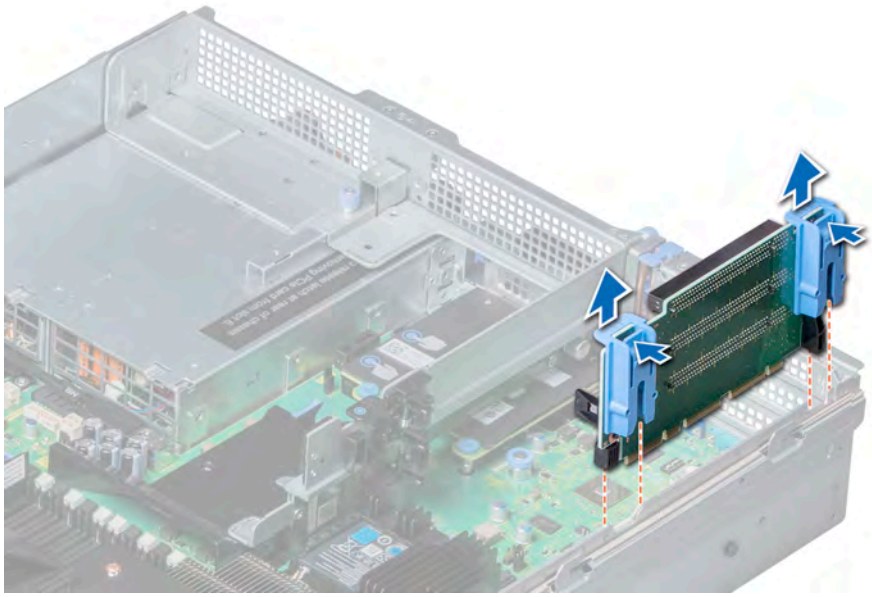
Before you begin

Follow the safety guidelines.

Procedure

1. If installed, remove the expansion cards from the riser.
2. Disconnect any cables connected to the riser.
3. Press the release latches, and lift the riser from the riser connector on the system board.

Figure 46 Removing expansion card riser 1

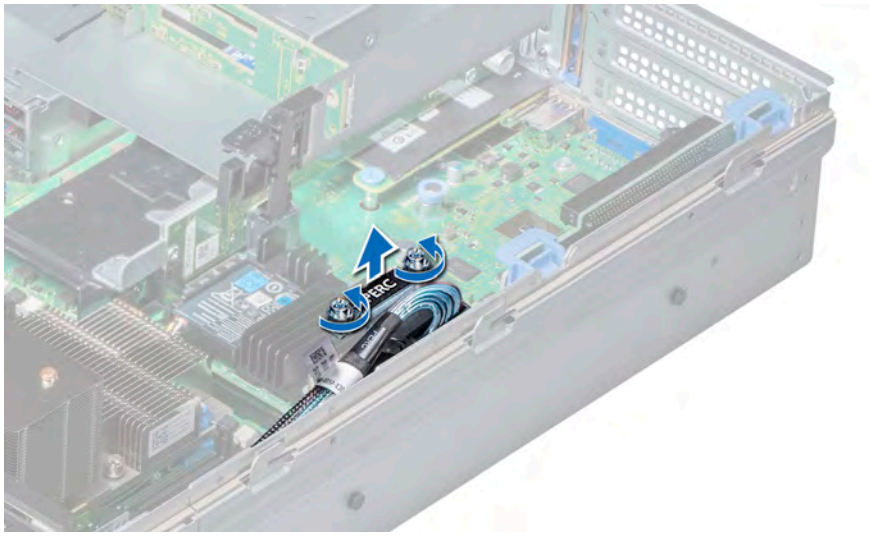


Remove the integrated storage controller card

Procedure

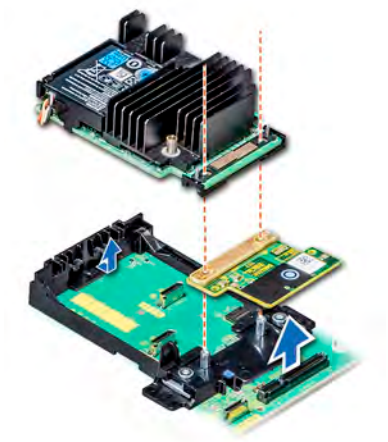
1. Using Phillips #2 screwdriver, loosen the screws that secure the integrated storage controller cable to the connector on the system board.
2. Lift the integrated storage controller cable away from the integrated storage controller.

Figure 47 Removing the integrated storage controller cable



3. Lift one end of the card and angle it to disengage the card from the integrated storage controller card holder on the system board.
4. Lift the card out of the system.
5. Hold the interposer board by its edges, and pull the board until the connector on the board disengages from the connector on the system board.

Figure 48 Removing the integrated storage controller card

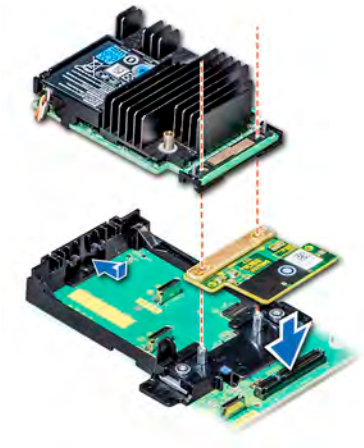


Install the integrated storage controller card

Procedure

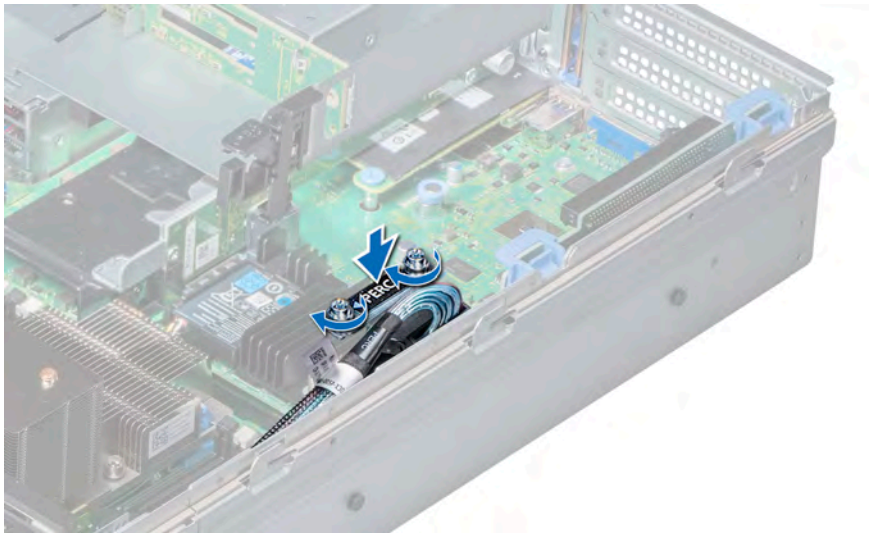
1. Hold the interposer board by its edges, and align the interposer board connector with the connector on the system board.
2. Press the touch point on the interposer board until the interposer board connector is firmly seated on the system board connector.
3. Angle the card to engage the card with the integrated storage controller card holder on the system board.
4. Lower the card into place until the card is fully seated in the integrated storage controller card holder.

Figure 49 Installing the integrated storage controller card



5. Route the integrated storage controller card cable along the wall of the system.
6. Align the screws on the integrated storage controller card cable with the screw holes on the connector.
7. Using Phillips #2 screwdriver, tighten the screws to secure the integrated storage controller card cable to the card connector on the system board.

Figure 50 Installing the integrated storage controller card cable



Install expansion card riser 1

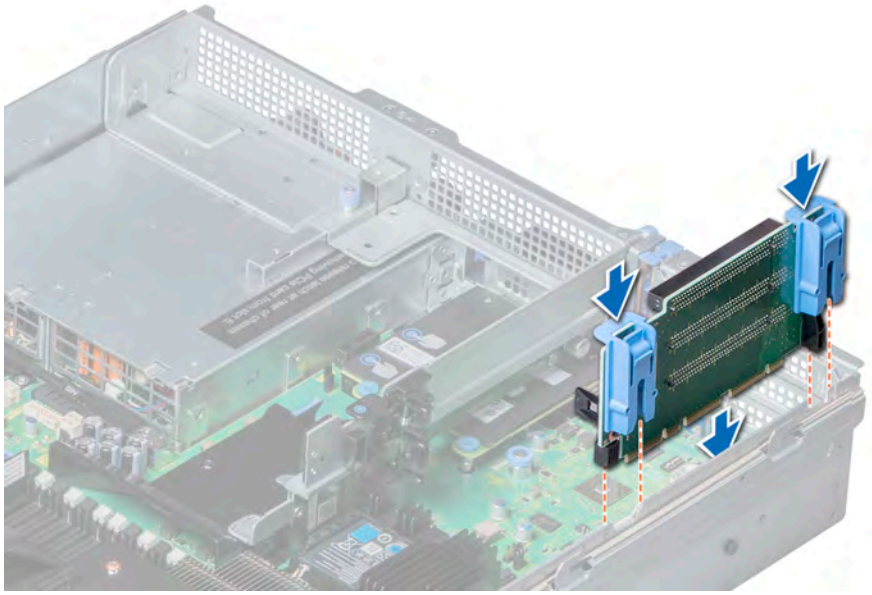
Before you begin

Follow the safety guidelines.

Procedure

1. Align the guide rails on the riser with the standoffs on the side of the system.
2. Lower the riser into the system until the riser connector engages with the connector on the system board.

Figure 51 Installing expansion card riser 1



3. Connect any cables disconnected from the riser.

Install the system cover

Procedure

1. Align the tabs on the system cover with the guide slots on the system.
2. Push the system cover latch down.

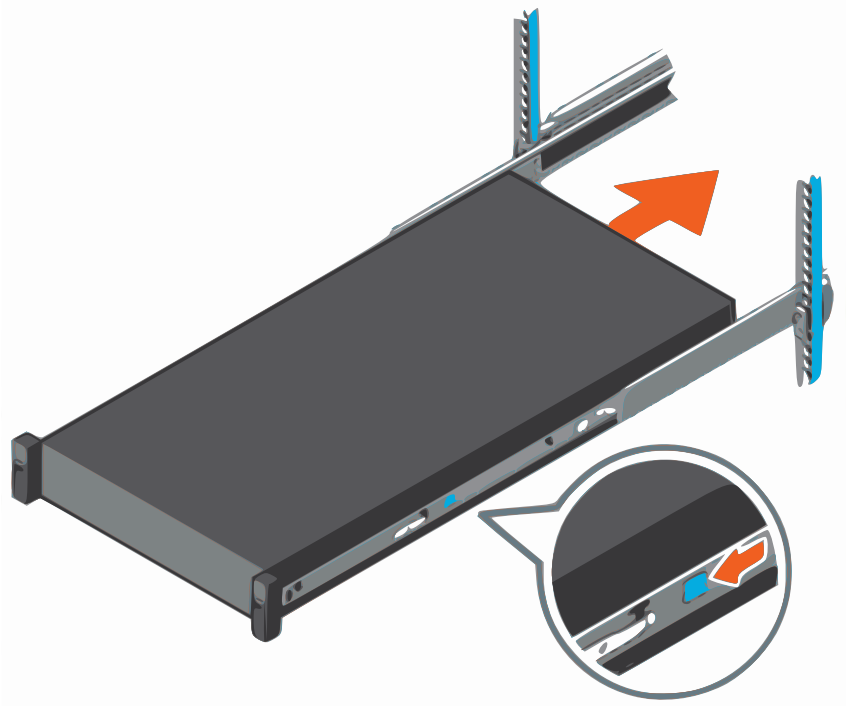
   The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the system cover latch locks into place.
3. Using a flat or Phillips head screwdriver, rotate the latch release lock clockwise to the locked position.

Slide the system into the cabinet

Procedure

1. At the front of the cabinet, push the system inward until the lock levers click into place.
2. Push the blue slide release lock tabs forward on both rails and slide the system into the cabinet. The slam latches will engage to secure the system in the cabinet.

Figure 52 Slide the system into the cabinet



Reconnect and power on the system

About this task

Complete the following steps to reconnect cables, power on the system, and reconnect a terminal session.

Procedure

1. Use the cable labels to reconnect the cables in the same configuration as they were before starting the replacement procedure.
2. Close the cable management arms.
3. Reconnect the serial console cable to the system serial port, and prepare the terminal session.
4. Reconnect the AC power cords to the power supplies.

   Note: The system may not power on automatically after plugging in the AC power cords.

5. If the system does not power on when the AC power cords were reconnected, press the power button on the right control panel at the front of the system.

6. When the system boots, log in as sysadmin.

Verify the replacement HBA330

About this task

Complete the following steps to verify the operation of the replacement HBA330.

Procedure

1. Use the `alerts show current` (or `alerts show current-detailed`) command.

   ```
   # alerts show current
   No active alerts
   ```

2. Use the `disk show hardware` command to verify all the disks appear correctly.
3. Use the `enclsoure show topology` command to verify SAS connectivity.
4. Use the `disk port show summary` command to verify each disk shelf is connected to one SAS port on each HBA.
5. Use the `disk multipath status` command to verify there is an active path and a standby path for each disk.

CHAPTER 11

Replace a CPU

Complete the following procedure to replace a CPU.

This FRU is not hot-swappable, and requires a system shutdown to replace.

Verify the status of the CPU

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to verify the status of the CPU.

Procedure

1. Use the `enclosure show cpu` command to verify a CPU failure.

Shut down and disconnect the system

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to shut down and disconnect the system.

Procedure

1. Stop the system using the `system poweroff` command to allow the proper shut down of the file system and other system components. The power down process takes approximately five minutes to complete. The `system poweroff` command immediately turns the front panel blue LED to amber, and is complete when the front panel LED turns off.

   Note: The system fans still run, and NIC port LEDs still flash after running the `system poweroff` command.

2. Open the cable management arms.
3. Label each of the cables as to their connection location. Taking a photograph for reference is also helpful for re-connecting the cables.
4. Disconnect the AC power cords from the rear of the system.
5. Disconnect all network cables from the rear of the system.
6. Disconnect all SAS cables from the rear of the system.
7. Disconnect the serial console cable.

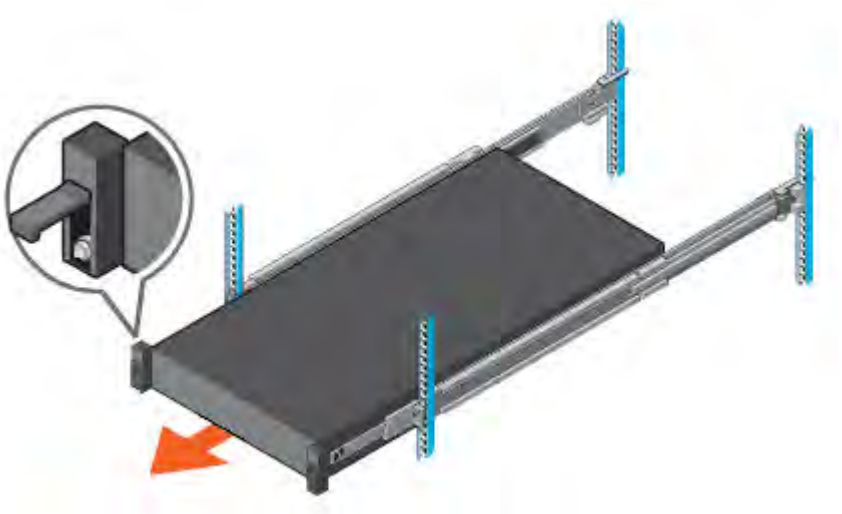
Extend the system from the cabinet

This procedure is used to extend the system from the cabinet so that the system cover can be removed to access the internal FRU components, or used in removing the system from the cabinet.

Procedure

1. At the front of the cabinet, locate the two slam latches on the left and right sides of the system. Pull the slam latches up to release the system from the cabinet. If the slam latches do not disengage, loosen the screw under each latch.

2. Using the slam latches, pull the system from the cabinet until the rails lock in the extended position.



Remove the system cover

Procedure

1. Using a flat or a Phillips head screwdriver, rotate the latch release lock counter clockwise to the unlocked position.
2. Lift the latch till the system cover slides back and the tabs on the system cover disengage from the guide slots on the system.
3. Hold the cover on both sides, and lift the cover away from the system.

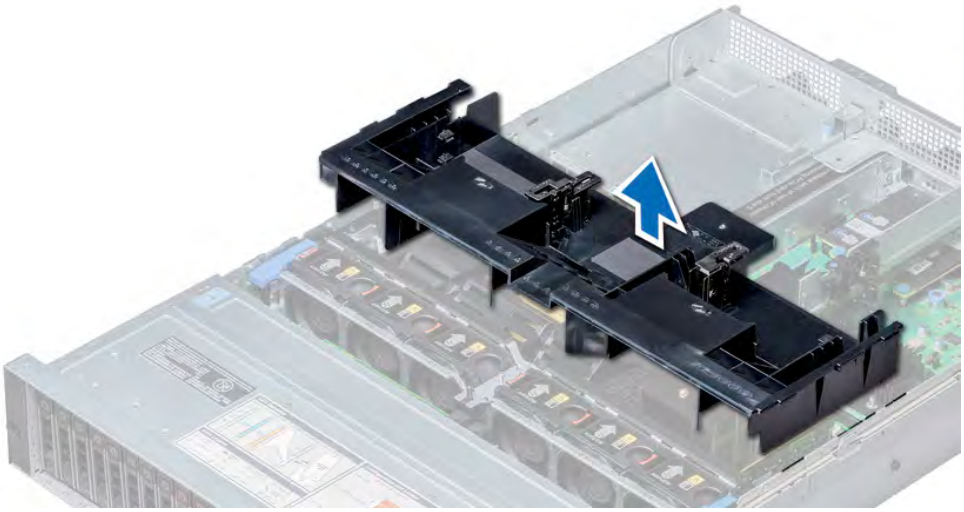
Figure 53 Remove System cover

Removing the air shroud

Procedure

1. Hold the air shroud at both ends and lift it away from the system.

Figure 54 Removing the air shroud



Remove processor and heat sink module

Before you begin

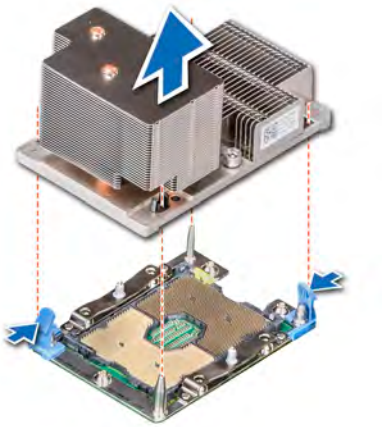
WARNING The heat sink may be hot to touch for some time after the system has been powered down. Allow the heat sink to cool before removing it.

Procedure

1. Using a Torx #T30 screwdriver, loosen the screws on the heat sink.

   Note: Ensure that you loosen one screw before moving on to the next screw.

2. Pushing both retention clips simultaneously, lift the processor and heat sink module (PHM) out of the system.
3. Set the PHM aside with the processor side facing up.



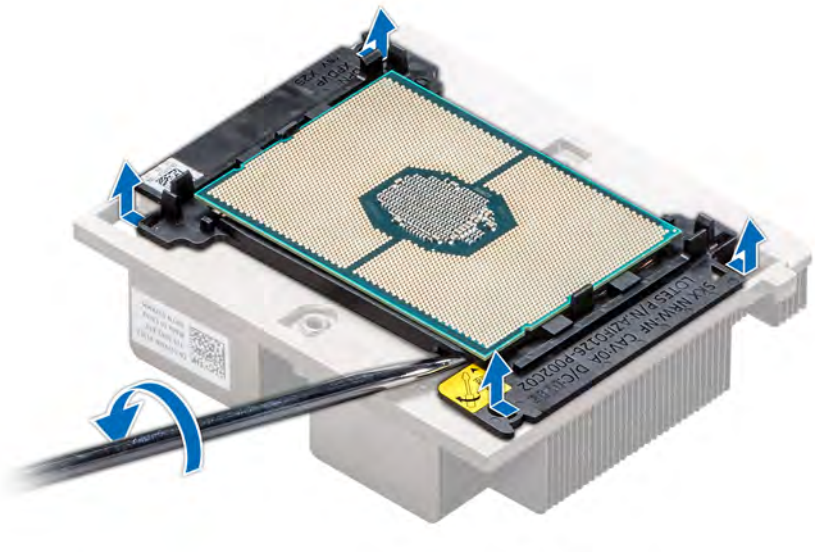
Remove the processor from the processor and heat sink module

Before you begin

WARNING The heat sink may be hot to touch for some time after the system has been powered down. Allow the heat sink to cool before removing it.

Procedure

1. Place the heat sink with the processor side facing up.
2. Insert a flat blade screwdriver into the release slot marked with a yellow label. Twist (do not pry) the screwdriver to break the thermal paste seal.
3. Push the retaining clips on the processor bracket to unlock the bracket from the heat sink.



4. Lift the bracket and the processor away from the heat sink, and place the processor connector side down on the processor tray.

5. Flex the outer edges of the bracket to release the processor from the bracket.

   Note: Ensure that the processor and the bracket are placed in the tray after you remove the heat sink.

Install the processor into a processor and heat sink module

Procedure

1. Place the processor in the processor tray.

   Note: Ensure that the pin 1 indicator on the processor tray is aligned with the pin 1 indicator on the processor. The pin 1 indicator is a triangle marking on the corner of the heatsink and on the corner of the processor.

2. Flex the outer edges of the bracket around the processor ensuring that the processor is locked into the clips on the bracket.

   Note: Ensure that pin 1 indicator on the bracket is aligned with the pin 1 indicator on the processor before placing the bracket on the processor.

   Note: Ensure that the processor and the bracket are placed in the tray before you install the heat sink.

3. If you are using an existing heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.
4. Use the thermal grease syringe included with your processor kit to apply the grease in a quadrilateral design on the top of the processor.

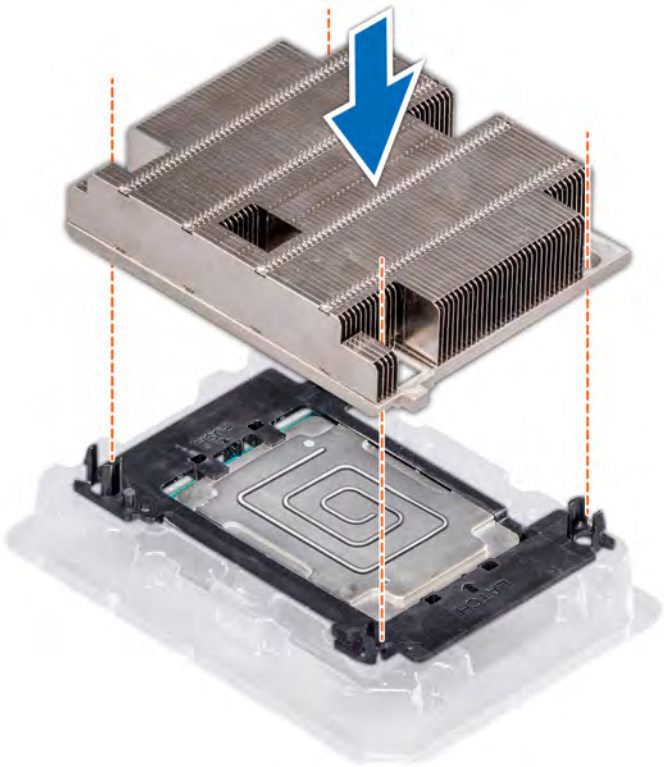
   CAUTION Applying too much thermal grease can result in excess grease coming in contact with and contaminating the processor socket.

   Note: The thermal grease syringe is intended for single use only. Dispose the syringe after you use it.

5. Place the heat sink on the processor and push down until the bracket locks onto the heat sink.

Note:

- Ensure that the two guide pin holes on the bracket match the guide holes on the heat sink.
- Ensure that the pin 1 indicator on the heat sink is aligned with the pin 1 indicator on the bracket before placing the heat sink onto the processor and bracket.



Install a processor and heat sink module

Before you begin

CAUTION Never remove the heat sink from a processor unless you intend to replace the processor. The heat sink is necessary to maintain proper thermal conditions.

WARNING The heat sink may be hot to touch for some time after the system has been powered down. Allow the heat sink to cool before removing it.

Procedure

1. Align the pin 1 indicator of the heat sink to the system board and then place the processor and heat sink module (PHM) on the processor socket.

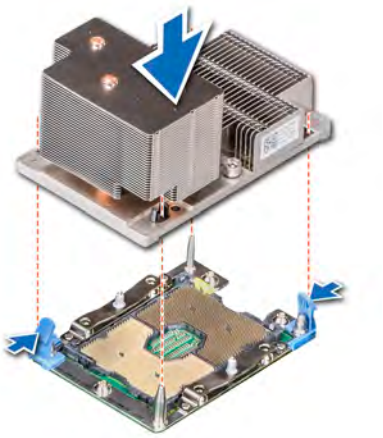
   CAUTION To avoid damaging the fins on the heat sink, do not press down on the heat sink fins.

   Note: Ensure that the PHM is held parallel to the system board to prevent damaging the components.

2. Push the blue retention clips inward to allow the heat sink to drop into place.
3. Using the #Torx T30 screwdriver with adjustable torque, tighten one screw at a time.

Note: Ensure that the screw is tightened completely before moving onto the next screw.

Note: The processor and heat sink module retention screws should not be tightened to more than 0.13 kgf-m (1.35 N.m or 12 in-lbf).



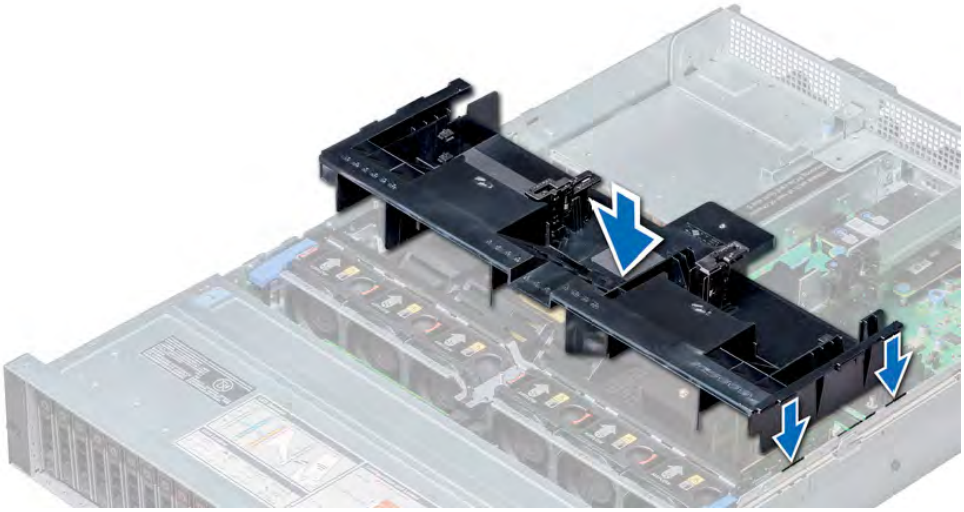
Installing the air shroud

Procedure

1. Align the tabs on the air shroud with the slots on the system.
2. Lower the air shroud into the system until it is firmly seated.

   When firmly seated, the memory socket numbers marked on the air shroud align with the respective memory sockets.

Figure 55 Installing the air shroud



Install the system cover

Procedure

1. Align the tabs on the system cover with the guide slots on the system.
2. Push the system cover latch down.

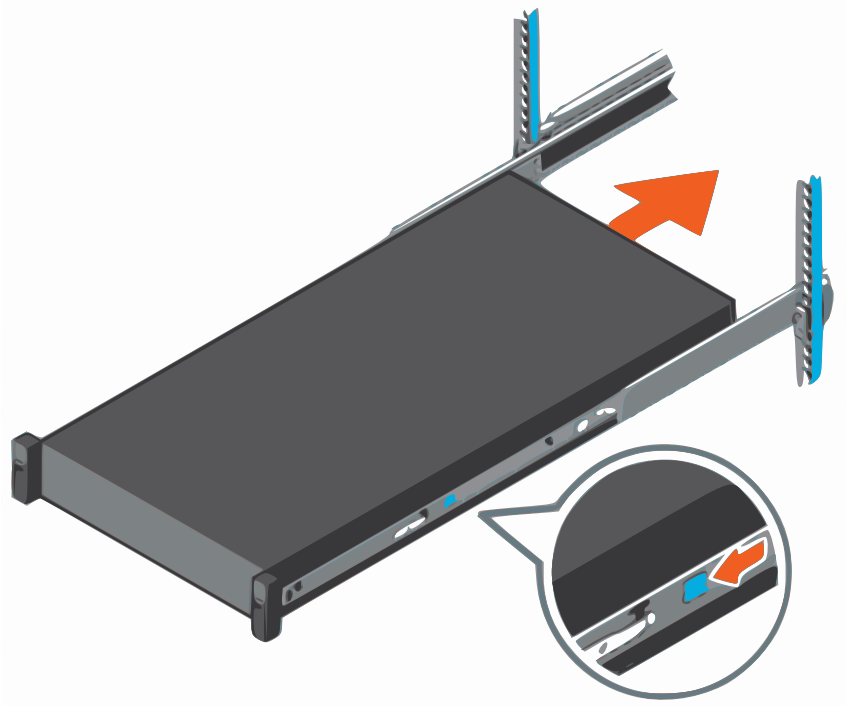
   The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the system cover latch locks into place.
3. Using a flat or Phillips head screwdriver, rotate the latch release lock clockwise to the locked position.

Slide the system into the cabinet

Procedure

1. At the front of the cabinet, push the system inward until the lock levers click into place.
2. Push the blue slide release lock tabs forward on both rails and slide the system into the cabinet. The slam latches will engage to secure the system in the cabinet.

Figure 56 Slide the system into the cabinet



Reconnect and power on the system

About this task

Complete the following steps to reconnect cables, power on the system, and reconnect a terminal session.

Procedure

1. Use the cable labels to reconnect the cables in the same configuration as they were before starting the replacement procedure.
2. Close the cable management arms.
3. Reconnect the serial console cable to the system serial port, and prepare the terminal session.
4. Reconnect the AC power cords to the power supplies.

   Note: The system may not power on automatically after plugging in the AC power cords.

5. If the system does not power on when the AC power cords were reconnected, press the power button on the right control panel at the front of the system.

6. When the system boots, log in as sysadmin.

Verify the replacement CPU

About this task

Complete the following steps to verify the operation of the replacement CPU.

Procedure

1. Use the `enclosure show cpu` command to verify the new CPU.
2. Use the `alerts show current` (or `alerts show current-detailed`) command.

```
# alerts show current
No active alerts
```

CHAPTER 12

Replace the system board

Complete the following procedure to replace the system board.

This FRU is not hot-swappable, and requires a system shutdown to replace.

Verify the status of the system board

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to verify the system board.

Procedure

1.

Shut down and disconnect the system

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to shut down and disconnect the system.

Procedure

1. Stop the system using the `system poweroff` command to allow the proper shut down of the file system and other system components. The power down process takes approximately five minutes to complete. The `system poweroff` command immediately turns the front panel blue LED to amber, and is complete when the front panel LED turns off.

   Note: The system fans still run, and NIC port LEDs still flash after running the `system poweroff` command.

2. Open the cable management arms.
3. Label each of the cables as to their connection location. Taking a photograph for reference is also helpful for re-connecting the cables.
4. Disconnect the AC power cords from the rear of the system.
5. Disconnect all network cables from the rear of the system.
6. Disconnect all SAS cables from the rear of the system.
7. Disconnect the serial console cable.

Remove a power supply

Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. Disconnect the power cable from the power source and from the PSU you intend to remove, and then remove the cable from the strap on the PSU handle.

2. Press the release latch and slide the PSU out of the system by using the PSU handle.

Extend the system from the cabinet

This procedure is used to extend the system from the cabinet so that the system cover can be removed to access the internal FRU components, or used in removing the system from the cabinet.

Procedure

1. At the front of the cabinet, locate the two slam latches on the left and right sides of the system. Pull the slam latches up to release the system from the cabinet. If the slam latches do not disengage, loosen the screw under each latch.
2. Using the slam latches, pull the system from the cabinet until the rails lock in the extended position.

Remove the system cover

Procedure

1. Using a flat or a Phillips head screwdriver, rotate the latch release lock counter clockwise to the unlocked position.
2. Lift the latch till the system cover slides back and the tabs on the system cover disengage from the guide slots on the system.
3. Hold the cover on both sides, and lift the cover away from the system.

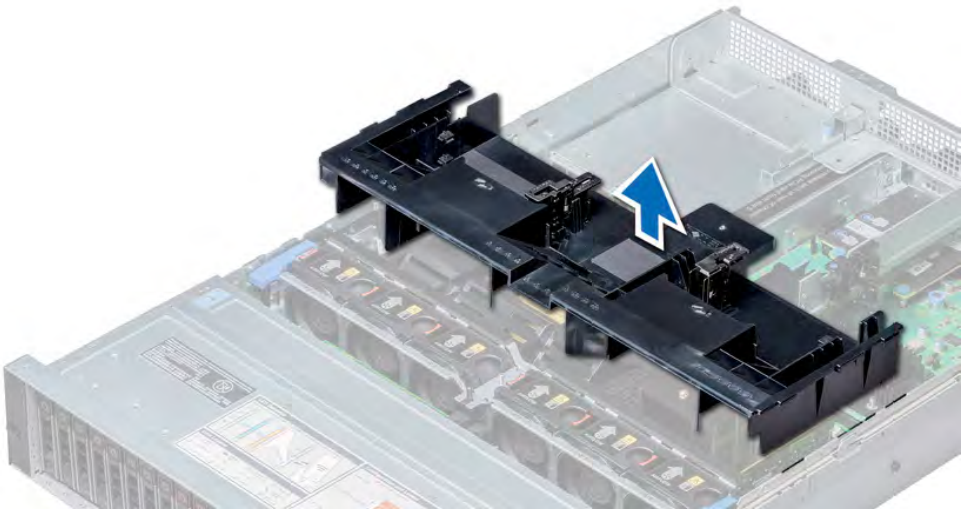
Figure 57 Remove System cover

Removing the air shroud

Procedure

1. Hold the air shroud at both ends and lift it away from the system.

Figure 58 Removing the air shroud

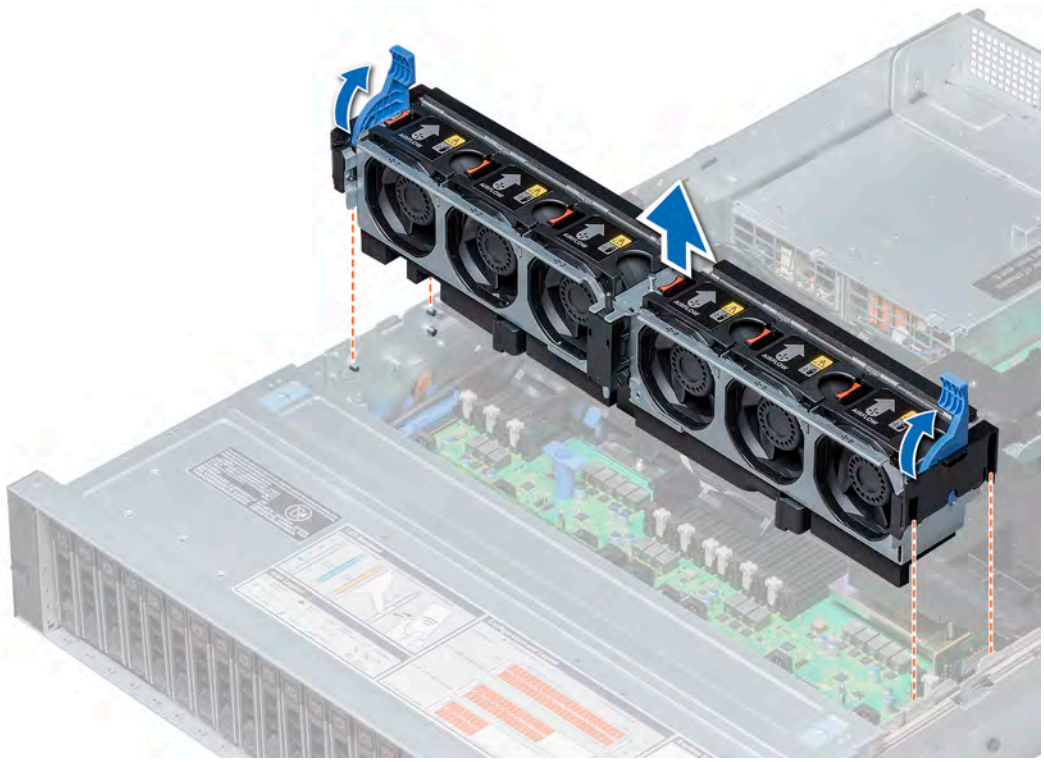


Remove the cooling fan assembly

Procedure

1. Lift the release levers to unlock the cooling fan assembly from the system.
2. Hold the release levers, and lift the cooling fan assembly away from the system.

Figure 59 Removing the cooling fan



Remove expansion card riser 1

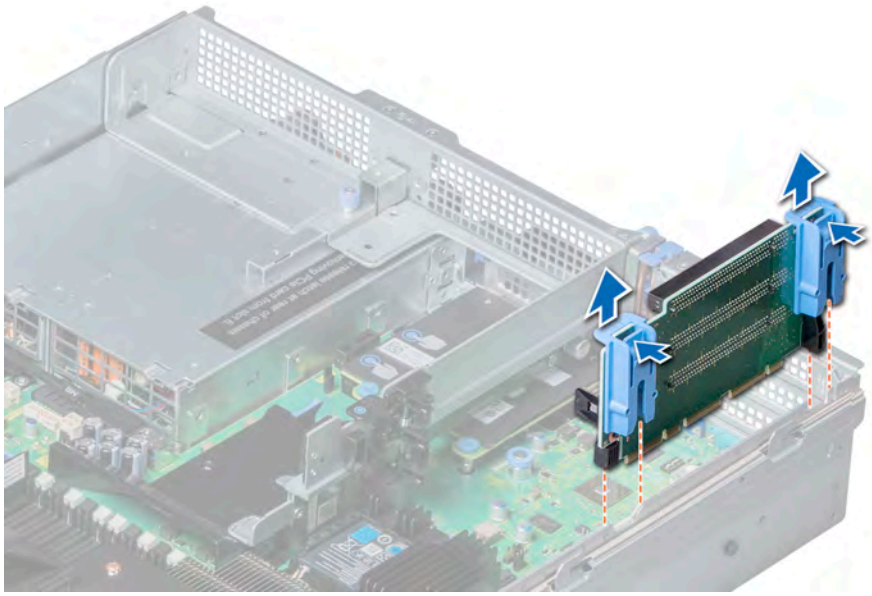
Before you begin

Follow the safety guidelines.

Procedure

1. If installed, remove the expansion cards from the riser.
2. Disconnect any cables connected to the riser.
3. Press the release latches, and lift the riser from the riser connector on the system board.

Figure 60 Removing expansion card riser 1



Remove expansion card riser 2

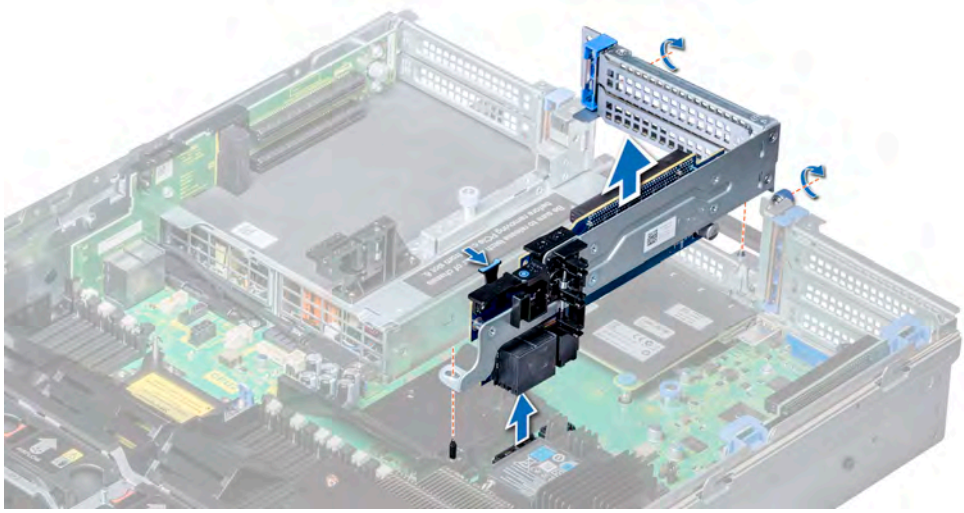
Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. If installed, remove expansion cards installed on the riser.
2. Disconnect any cables connected to the riser.
3. To remove expansion card riser 2:
   a. Using Phillips #2 screwdriver, loosen the screws that secure the riser to the system.
   b. Press the release tab, and holding the riser by its edges, lift the riser from the riser connector on the system board.

Figure 61 Removing expansion card riser 2



Remove expansion card riser 3

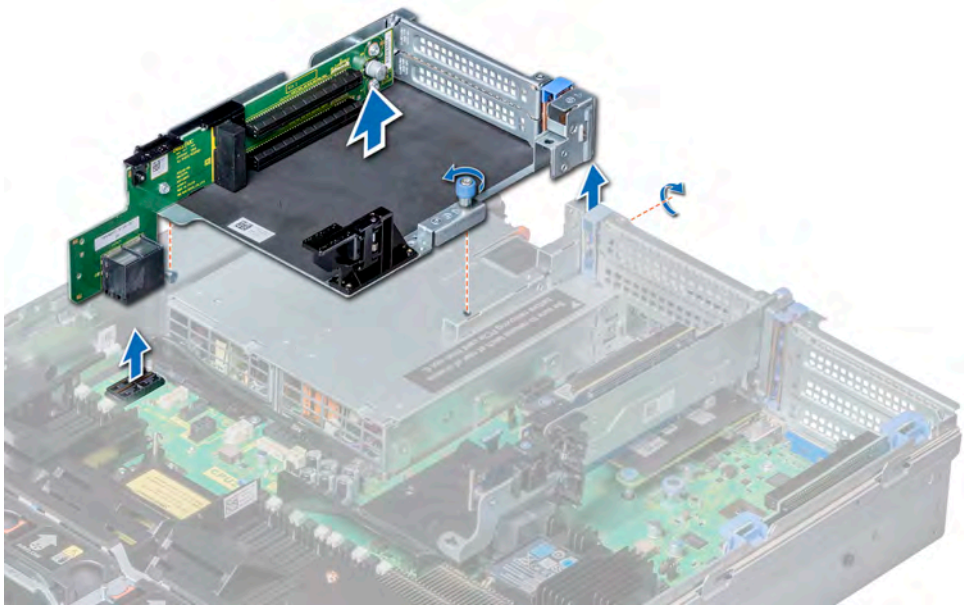
Before you begin

Follow the safety guidelines.

Procedure

1. If installed, remove expansion cards installed on the riser.
2. Disconnect any cables connected to the riser.
3. Using Phillips #2 screwdriver, loosen the screw that secures the riser to the system.
4. Press the release tab, and holding the riser by its edges, lift the riser from the riser connector on the system board.

Figure 62 Removing expansion card riser 3

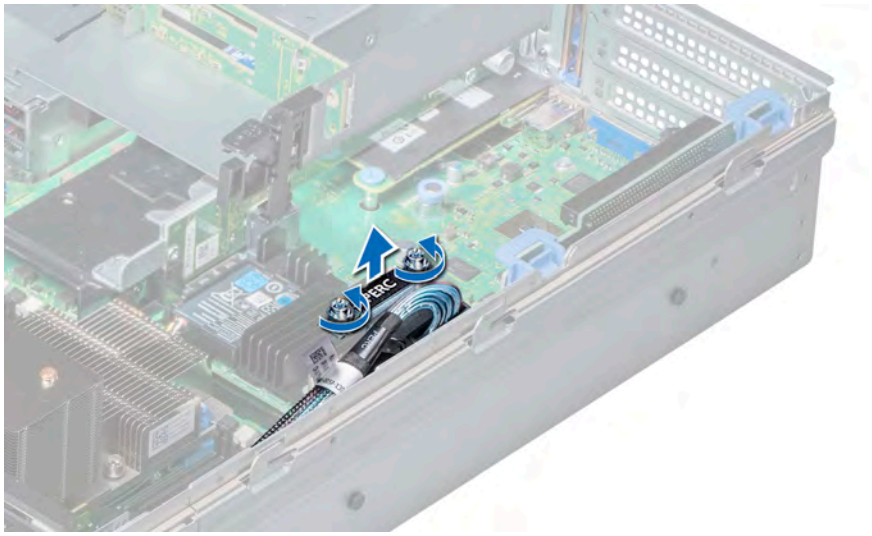


Remove the integrated storage controller card

Procedure

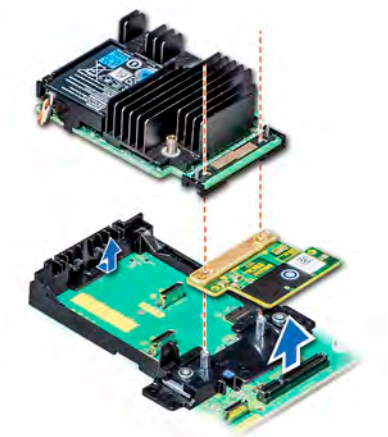
1. Using Phillips #2 screwdriver, loosen the screws that secure the integrated storage controller cable to the connector on the system board.
2. Lift the integrated storage controller cable away from the integrated storage controller.

Figure 63 Removing the integrated storage controller cable



3. Lift one end of the card and angle it to disengage the card from the integrated storage controller card holder on the system board.
4. Lift the card out of the system.
5. Hold the interposer board by its edges, and pull the board until the connector on the board disengages from the connector on the system board.

Figure 64 Removing the integrated storage controller card



Remove the memory module

Before you begin

WARNING Allow the memory modules to cool after you power off the system. Handle the memory modules by the card edges and avoid touching the components or metallic contacts on the memory module.

CAUTION To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. Remove memory module blanks only if you intend to install memory modules in those sockets.

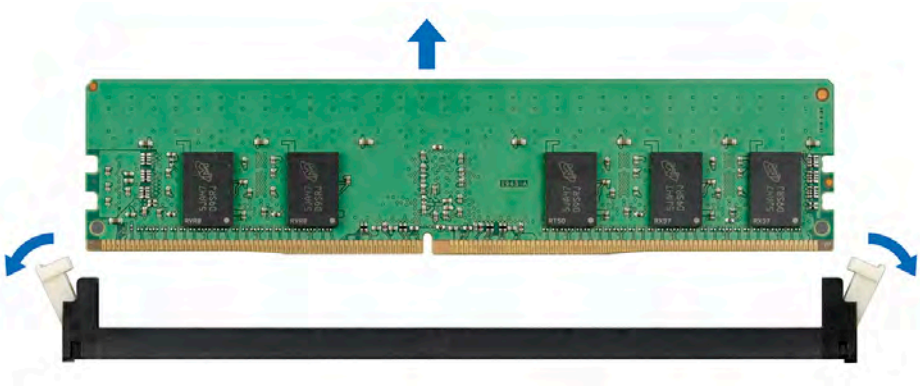
Procedure

1. Locate the appropriate memory module socket.

   CAUTION Handle each memory module only by the card edges, ensuring not to touch the middle of the memory module or metallic contacts.

2. Push the ejectors outward on both ends of the memory module socket to release the memory module from the socket.
3. Lift and remove the memory module from the system.

Figure 65 Removing a memory module



Remove processor and heat sink module

Before you begin

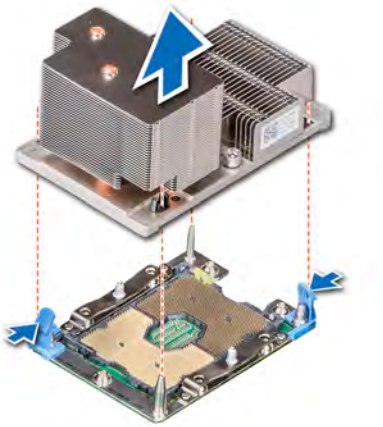
WARNING The heat sink may be hot to touch for some time after the system has been powered down. Allow the heat sink to cool before removing it.

Procedure

1. Using a Torx #T30 screwdriver, loosen the screws on the heat sink.

   Note: Ensure that you loosen one screw before moving on to the next screw.

2. Pushing both retention clips simultaneously, lift the processor and heat sink module (PHM) out of the system.
3. Set the PHM aside with the processor side facing up.



Removing system board

Before you begin

Procedure

1. Disconnect all cables from the system board.

   CAUTION Take care not to damage the system identification button while removing the system board from the chassis.

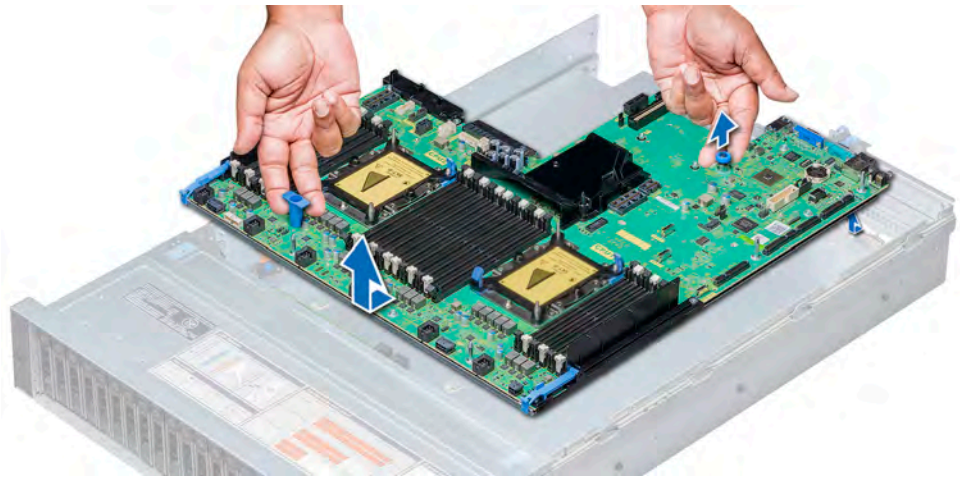
   CAUTION Do not lift the system board by holding a memory module, processor, or other components.

2. Holding the system board holder, pull the blue release pin, lift the system board, and then slide it toward the front of the chassis.

   Sliding the system board toward the front of the chassis disengages the connectors from the back of the chassis slots.

3. Lift the system board out of the chassis.

Figure 66 Removing system board



Install the system board

Before you begin

Follow the safety guidelines.

Procedure

1. Unpack the replacement system board assembly.

   CAUTION Do not lift the system board by holding a memory module, processor, or other components.

   CAUTION Take care not to damage the system identification button while placing the system board into the chassis.

2. Holding the system board holder and blue release pin, push the system board toward the back of the system until the release pin clicks into place.

   Figure 67 Installing system board

Install the processor into a processor and heat sink module

Procedure

1. Place the processor in the processor tray.

   Note: Ensure that the pin 1 indicator on the processor tray is aligned with the pin 1 indicator on the processor. The pin 1 indicator is a triangle marking on the corner of the heatsink and on the corner of the processor.

2. Flex the outer edges of the bracket around the processor ensuring that the processor is locked into the clips on the bracket.

   Note: Ensure that pin 1 indicator on the bracket is aligned with the pin 1 indicator on the processor before placing the bracket on the processor.

   Note: Ensure that the processor and the bracket are placed in the tray before you install the heat sink.

3. If you are using an existing heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.
4. Use the thermal grease syringe included with your processor kit to apply the grease in a quadrilateral design on the top of the processor.

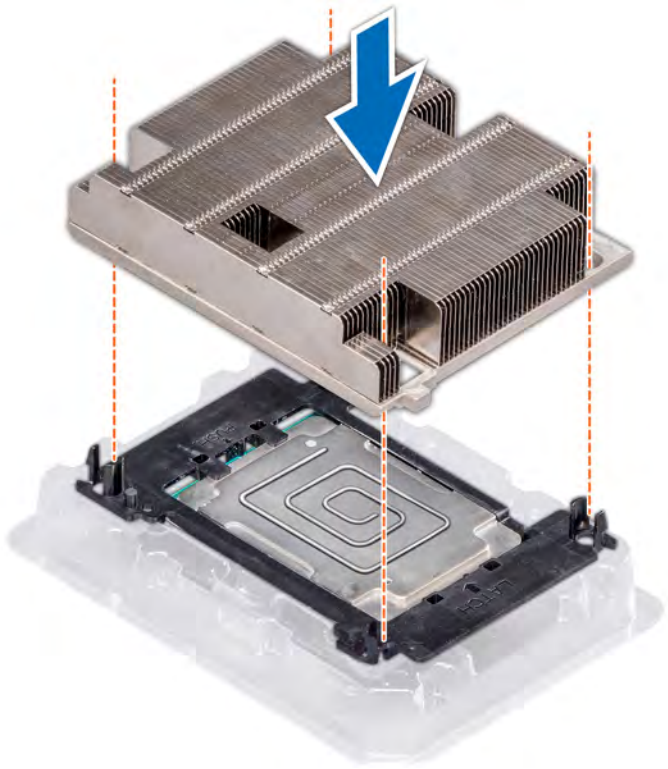
   CAUTION Applying too much thermal grease can result in excess grease coming in contact with and contaminating the processor socket.

   Note: The thermal grease syringe is intended for single use only. Dispose the syringe after you use it.

5. Place the heat sink on the processor and push down until the bracket locks onto the heat sink.

Note:

- Ensure that the two guide pin holes on the bracket match the guide holes on the heat sink.
- Ensure that the pin 1 indicator on the heat sink is aligned with the pin 1 indicator on the bracket before placing the heat sink onto the processor and bracket.



Install the memory module

Before you begin

CAUTION To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. Remove memory module blanks only if you intend to install memory modules in those sockets.

Procedure

1. Locate the appropriate memory module socket.

   CAUTION Handle each memory module only by the card edges, ensuring not to touch the middle of the memory module or metallic contacts.

   CAUTION To prevent damage to the memory module or the memory module socket during installation, do not bend or flex the memory module. You must insert both ends of the memory module simultaneously.

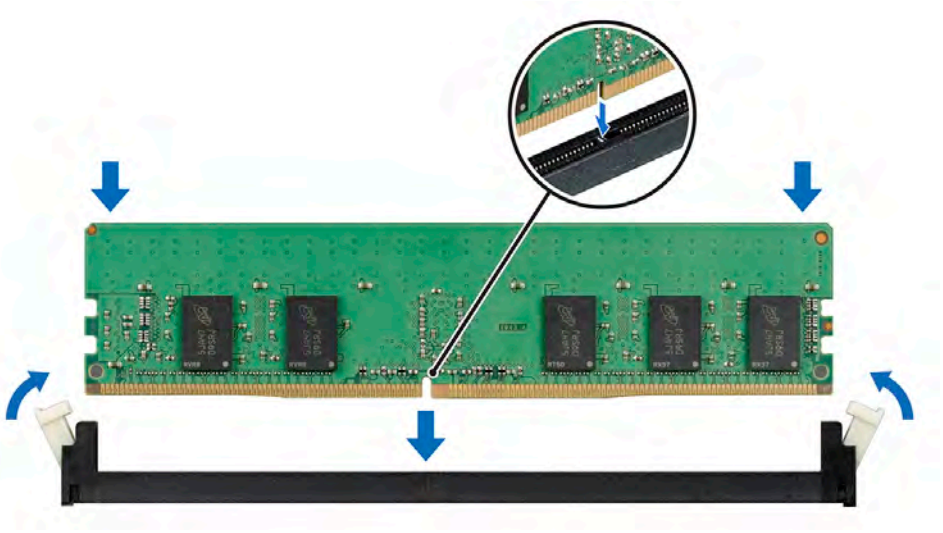
2. Open the ejectors on the memory module socket outward to allow the memory module to be inserted into the socket.
3. Align the edge connector of the memory module with the alignment key of the memory module socket, and insert the memory module in the socket.

CAUTION Do not apply pressure at the center of the memory module; apply pressure at both ends of the memory module evenly.

Note: The memory module socket has an alignment key that enables you to install the memory module in the socket in only one orientation.

4. Press the memory module with your thumbs until the socket levers firmly click into place.

Figure 68 Installing a memory module

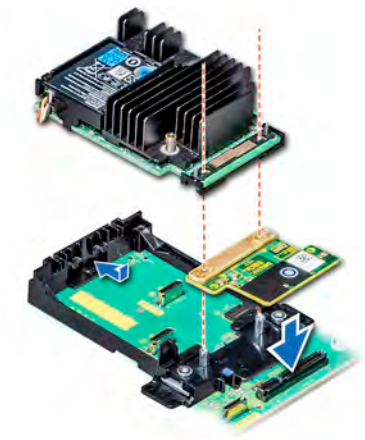


Install the integrated storage controller card

Procedure

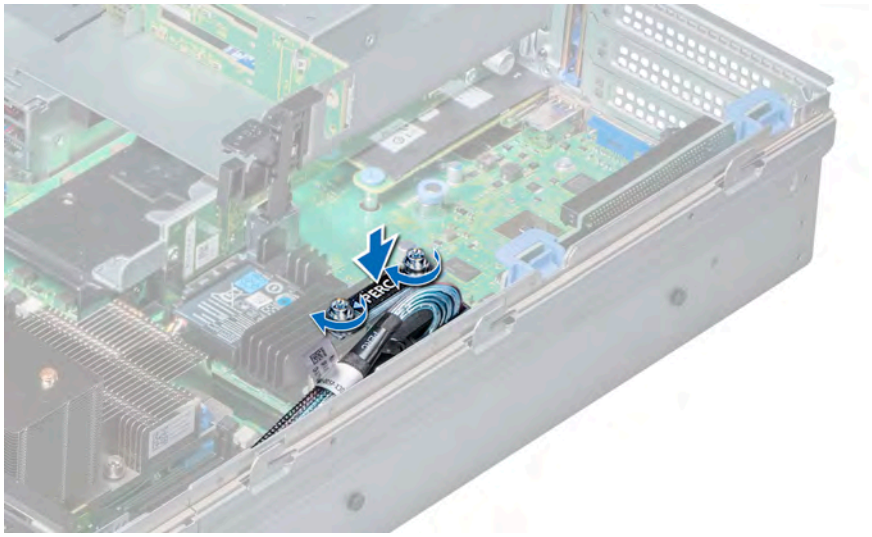
1. Hold the interposer board by its edges, and align the interposer board connector with the connector on the system board.
2. Press the touch point on the interposer board until the interposer board connector is firmly seated on the system board connector.
3. Angle the card to engage the card with the integrated storage controller card holder on the system board.
4. Lower the card into place until the card is fully seated in the integrated storage controller card holder.

Figure 69 Installing the integrated storage controller card



5. Route the integrated storage controller card cable along the wall of the system.
6. Align the screws on the integrated storage controller card cable with the screw holes on the connector.
7. Using Phillips #2 screwdriver, tighten the screws to secure the integrated storage controller card cable to the card connector on the system board.

Figure 70 Installing the integrated storage controller card cable



Install expansion card riser 1

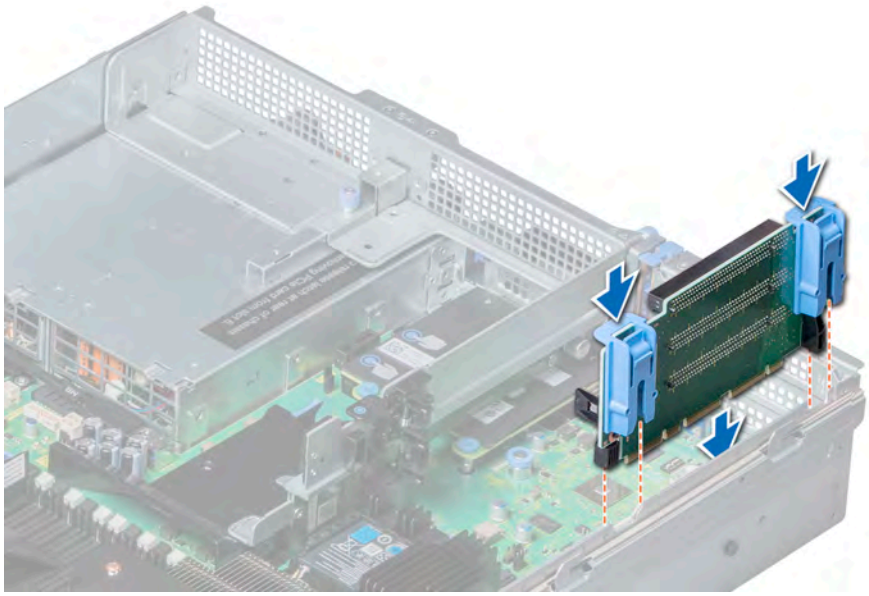
Before you begin

Follow the safety guidelines.

Procedure

1. Align the guide rails on the riser with the standoffs on the side of the system.
2. Lower the riser into the system until the riser connector engages with the connector on the system board.

Figure 71 Installing expansion card riser 1



3. Connect any cables disconnected from the riser.

Install expansion card riser 2

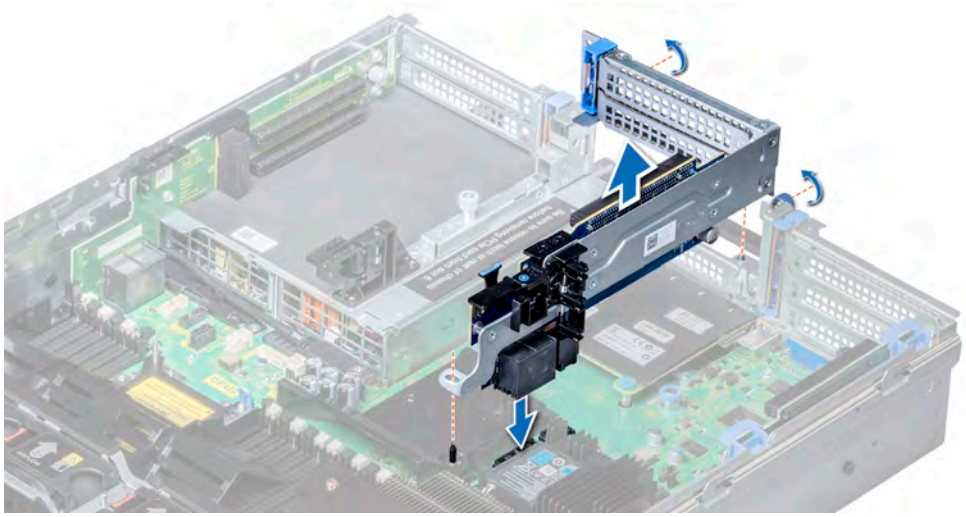
Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. To install expansion card riser 2:
   a. Align the screw and tab on the riser with the screw hole and slot on the system.
   b. Lower the riser into the system until the riser connector engages with the connector on the system board.
   c. Using Phillips #2 screwdriver, tighten the screws to secure the riser to the system.

Figure 72 Installing expansion card riser 2



Install expansion card riser 3

Before you begin

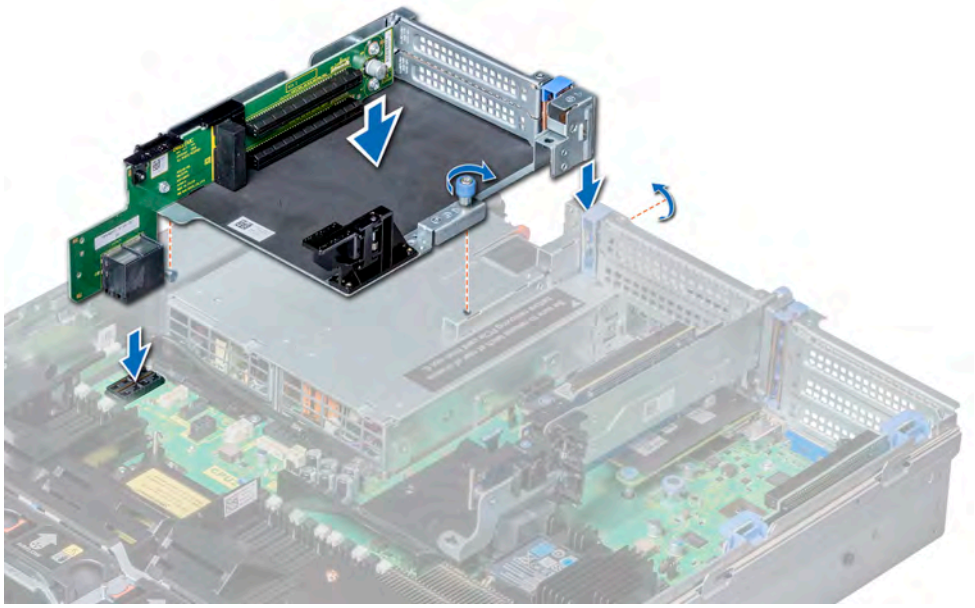
Follow the safety guidelines.

Procedure

1. Align the tab on the riser with the slot on the system, and guide rails on the riser with the standoffs on the side of the system.
2. Lower the riser into the system until the riser edge connector engages with the connector on the system board.

   The riser card edge engages with the riser guide on the system.
3. Using a Phillips #2 screwdriver, tighten the screw to secure the riser to the system.

Figure 73 Installing expansion card riser 3



Install the cooling fan assembly

Before you begin

Follow the safety guidelines.

About this task

CAUTION Ensure that the cables inside the system are correctly installed and retained by the cable retention bracket before installing the cooling fan assembly. Incorrectly installed cables may get damaged.

Procedure

1. Align the guide rails on the cooling fan assembly with the standoffs on the system.
2. Lower the cooling fan assembly into the system until the cooling fan connectors engage with the connectors on the system board.
3. Press the release levers to lock the cooling fan assembly into the system.

Figure 74 Installing the cooling fan assembly

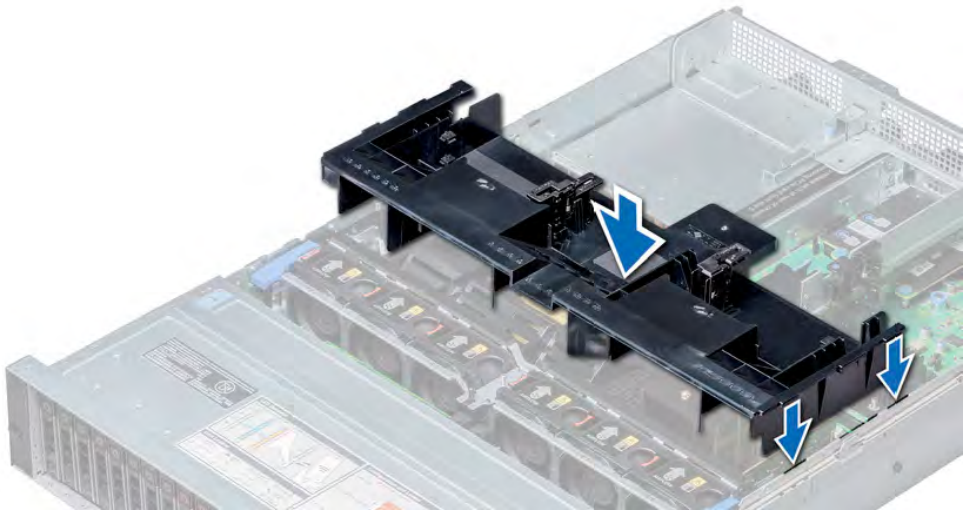
Installing the air shroud

Procedure

1. Align the tabs on the air shroud with the slots on the system.
2. Lower the air shroud into the system until it is firmly seated.

   When firmly seated, the memory socket numbers marked on the air shroud align with the respective memory sockets.

Figure 75 Installing the air shroud



Install the system cover

Procedure

1. Align the tabs on the system cover with the guide slots on the system.
2. Push the system cover latch down.

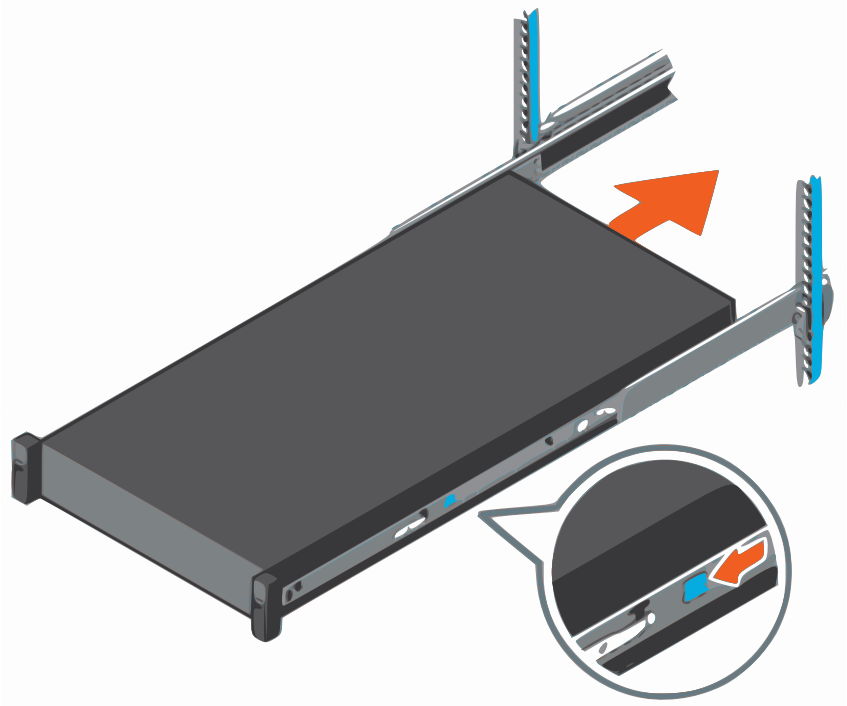
   The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the system cover latch locks into place.
3. Using a flat or Phillips head screwdriver, rotate the latch release lock clockwise to the locked position.

Slide the system into the cabinet

Procedure

1. At the front of the cabinet, push the system inward until the lock levers click into place.
2. Push the blue slide release lock tabs forward on both rails and slide the system into the cabinet. The slam latches will engage to secure the system in the cabinet.

Figure 76 Slide the system into the cabinet



Install the power supply unit

Before you begin

Follow the safety guidelines listed in Safety instructions on page 13.

Procedure

1. Verify that nothing has dropped into the empty PSU slot before installing the replacement PSU.
2. Slide the PSU into the system until the PSU is fully seated and the release latch snaps into place.
3. Connect the power cable to the PSU, and plug the cable into a power outlet.

   CAUTION When connecting the power cable to the PSU, secure the cable to the PSU with the strap.

   Note: When installing, hot swapping, or hot adding a new PSU, wait for 15 seconds for the system to recognize the PSU and determine its status. The PSU redundancy may not occur until discovery is complete. Wait until the new PSU is discovered and enabled before you remove the other PSU. The PSU status indicator turns green to signify that the PSU is functioning properly.

Reconnect and power on the system

About this task

Complete the following steps to reconnect cables, power on the system, and reconnect a terminal session.

Procedure

1. Use the cable labels to reconnect the cables in the same configuration as they were before starting the replacement procedure.
2. Close the cable management arms.
3. Reconnect the serial console cable to the system serial port, and prepare the terminal session.
4. Reconnect the AC power cords to the power supplies.

   Note: The system may not power on automatically after plugging in the AC power cords.

5. If the system does not power on when the AC power cords were reconnected, press the power button on the right control panel at the front of the system.

6. As the system boots, press `F2` to access the BIOS menu.

Enter the system Service Tag by using System Setup

If the automatic transfer of system information to the new system board during BIOS boot fails, the system prompts for the system Service Tag information. Use System Setup to enter the Service Tag.

Procedure

1. Press F2 to enter System Setup.
2. Click **Service Tag Settings**.
3. Enter the Service Tag.

   Note: You can enter the Service Tag only when the **Service Tag** field is empty. Ensure that you enter the correct Service Tag. After the Service Tag is entered, it cannot be updated or changed.

4. Click **Ok**.
5. Import your new or existing iDRAC Enterprise license.

   For more information, see the *Integrated Dell Remote Access Controller User's Guide* at https://Dell.com/idracmanuals.

CHAPTER 13

Replace the Bezel

Complete the following procedure to replace the bezel.

This CRU can be completed with the system powered on.

Remove the front bezel to access front panel hard drives

Procedure

1. Unlock the bezel by using the bezel key.
2. Press the release button, and pull the left end of the bezel.
3. Unhook the right end, and remove the bezel.

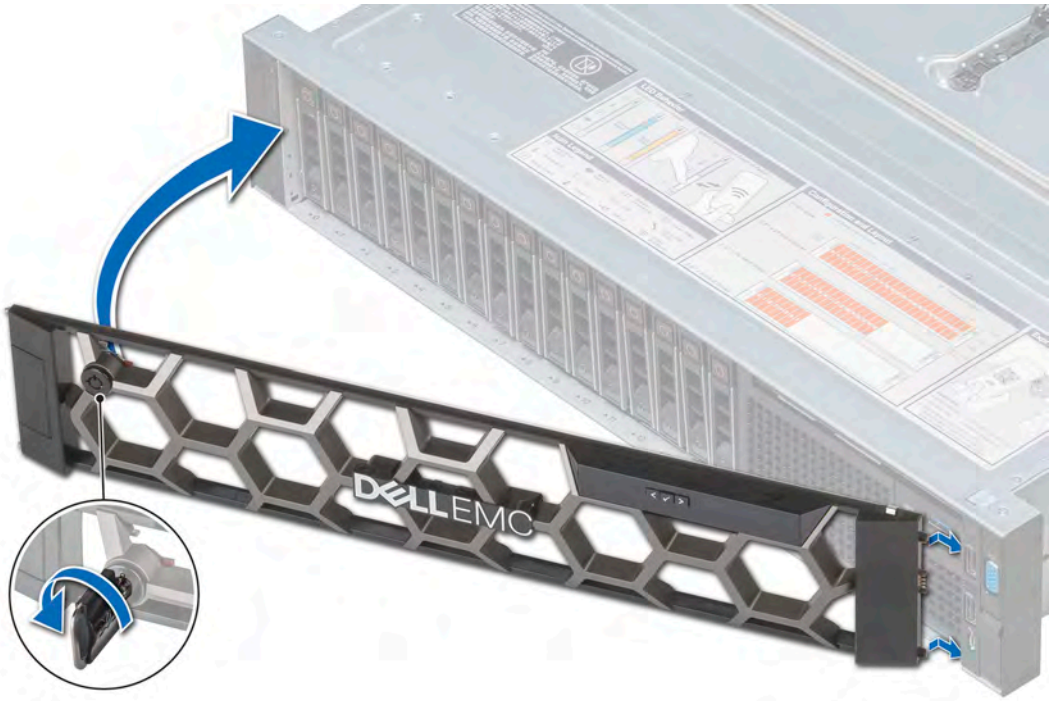
Figure 77 Removing the front bezel

Install the front bezel

Procedure

1. Align and insert the right end of the bezel onto the system.
2. Press the release button and fit the left end of the bezel onto the system.
3. Lock the bezel by using the key.

Figure 78 Installing the front bezel



CHAPTER 14

Replace the Rail Kit

Complete the following procedure to replace the rail kit.

This CRU is not hot-swappable, and requires a system shutdown to replace.

Shut down and disconnect the system

Before you begin

Establish a connection to the system as described in Establish a connection to the PowerProtect system on page 14.

About this task

Complete the following steps to shut down and disconnect the system.

Procedure

1. Stop the system using the `system poweroff` command to allow the proper shut down of the file system and other system components. The power down process takes approximately five minutes to complete. The `system poweroff` command immediately turns the front panel blue LED to amber, and is complete when the front panel LED turns off.

   Note: The system fans still run, and NIC port LEDs still flash after running the `system poweroff` command.

2. Open the cable management arms.
3. Label each of the cables as to their connection location. Taking a photograph for reference is also helpful for re-connecting the cables.
4. Disconnect the AC power cords from the rear of the system.
5. Disconnect all network cables from the rear of the system.
6. Disconnect all SAS cables from the rear of the system.
7. Disconnect the serial console cable.

Extend the system from the cabinet

This procedure is used to extend the system from the cabinet so that the system cover can be removed to access the internal FRU components, or used in removing the system from the cabinet.

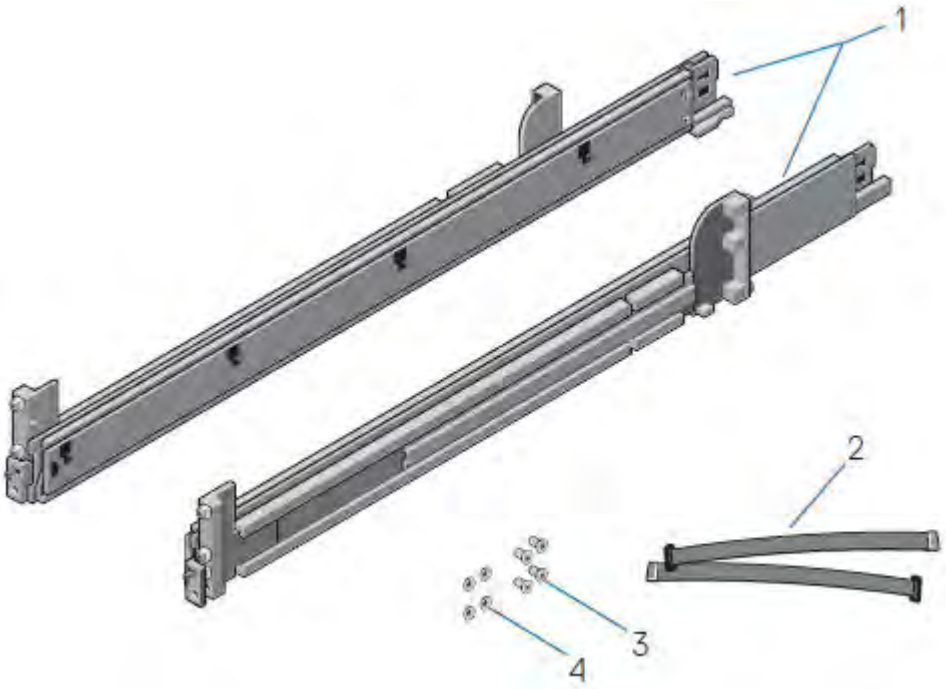
Procedure

1. At the front of the cabinet, locate the two slam latches on the left and right sides of the system. Pull the slam latches up to release the system from the cabinet. If the slam latches do not disengage, loosen the screw under each latch.
2. Using the slam latches, pull the system from the cabinet until the rails lock in the extended position.

Identifying the rail kit components

The 2U sliding rail assemblies allow the server to be secured in the cabinet, and extended from the cabinet so that the system cover can be removed to access the internal FRUs.

Figure 79 Sliding rail assembly - 2U systems

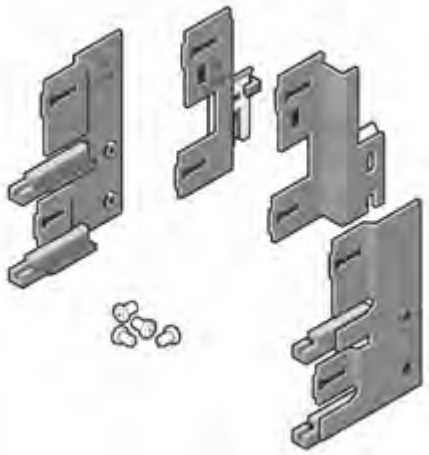


1. Sliding rail (2)
2. Velcro strap (2)
3. Screw (4)
4. Washer (4)

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

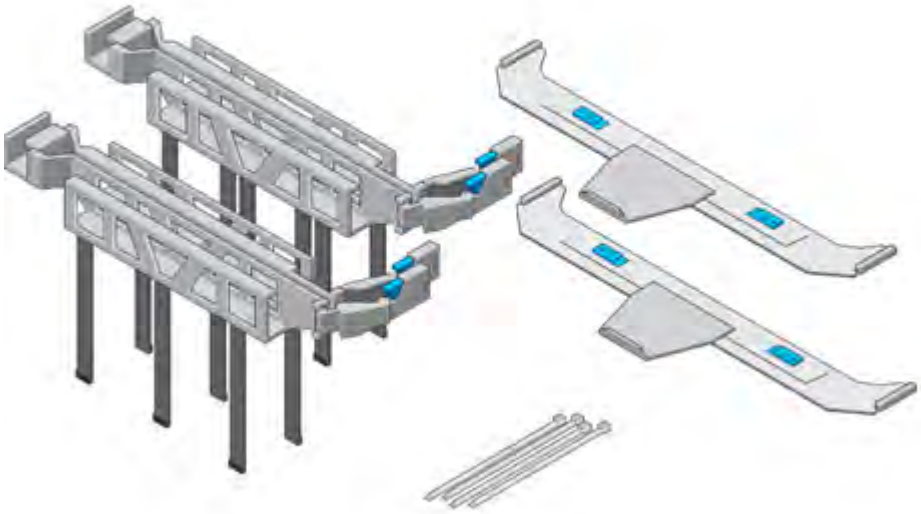
The rail kit also includes a unique cable management arm (CMA) bracket assembly that consists of inner and outer brackets, and screws to attach the brackets to the rails.

Figure 80 CMA brackets



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

Figure 81 CMA arms and separators



Remove the system from the cabinet

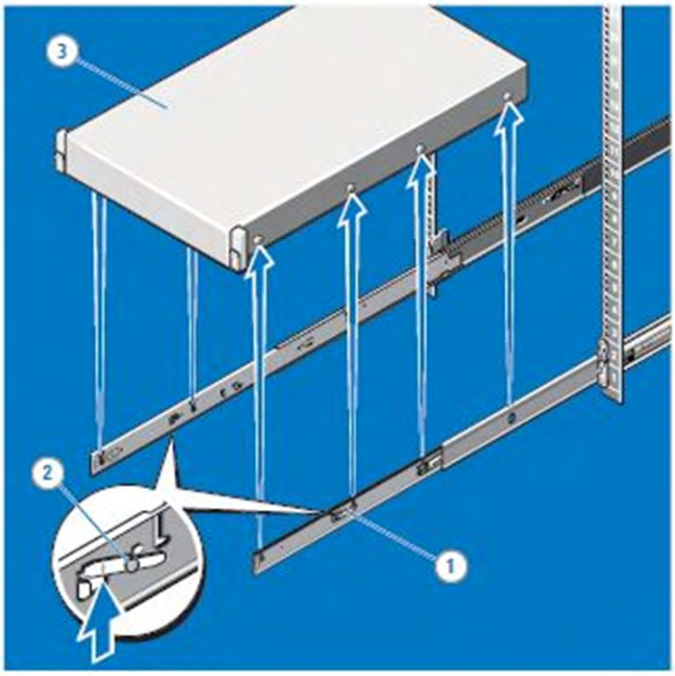
Procedure

1. At the front of the cabinet, locate the two slam latches on left and right side of the system. Pull the slam latches up to release the system from the cabinet. If the slam latches do not disengage, loosen the screw under each latch.
2. Using the slam latches, pull the system from the cabinet until the rails lock in the extended position.

Figure 82 Release and extend system from cabinet

3. Locate the lock levers on the sides of the inner rails (1). Unlock each lever by rotating it up to its release position (2). Grasp the sides of the system (3) firmly and pull it forward until the standoffs are at the front of the J-slots in the rails. Lift the system up and away from the rails.

Figure 83 Removing system from rails

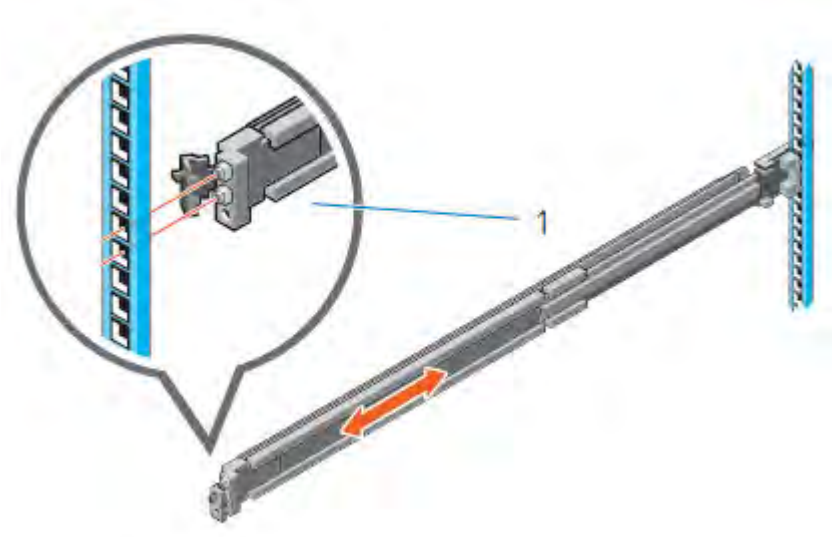


4. Place the system on a suitable work surface. Ensure the work surface(s) is capable of supporting the weight.

Removing the rails

Procedure

1. Open the front latch and disengage the rail from the flange.



2. Pull the entire rail forward to release the rear end of the rail from the flange.

Remove the original CMA brackets

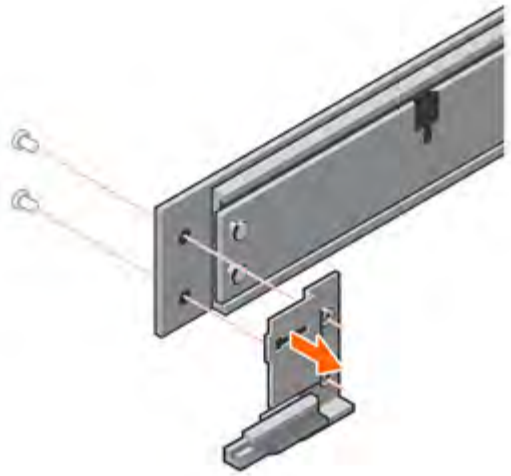
About this task

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

Procedure

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

   Figure 84 Remove the original CMA bracket



2. Repeat the previous step for the second rail.

Attach the new CMA brackets

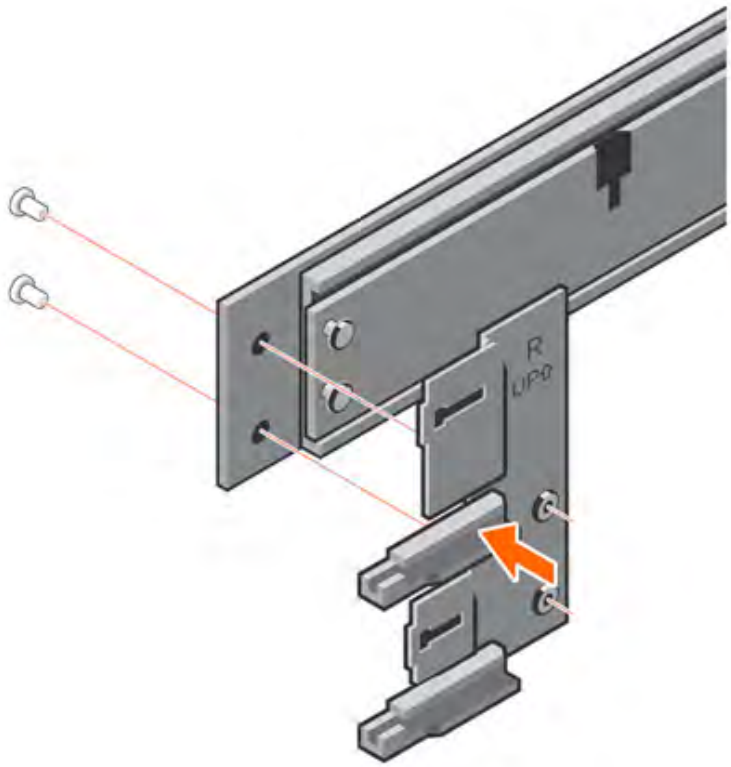
About this task

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

Procedure

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

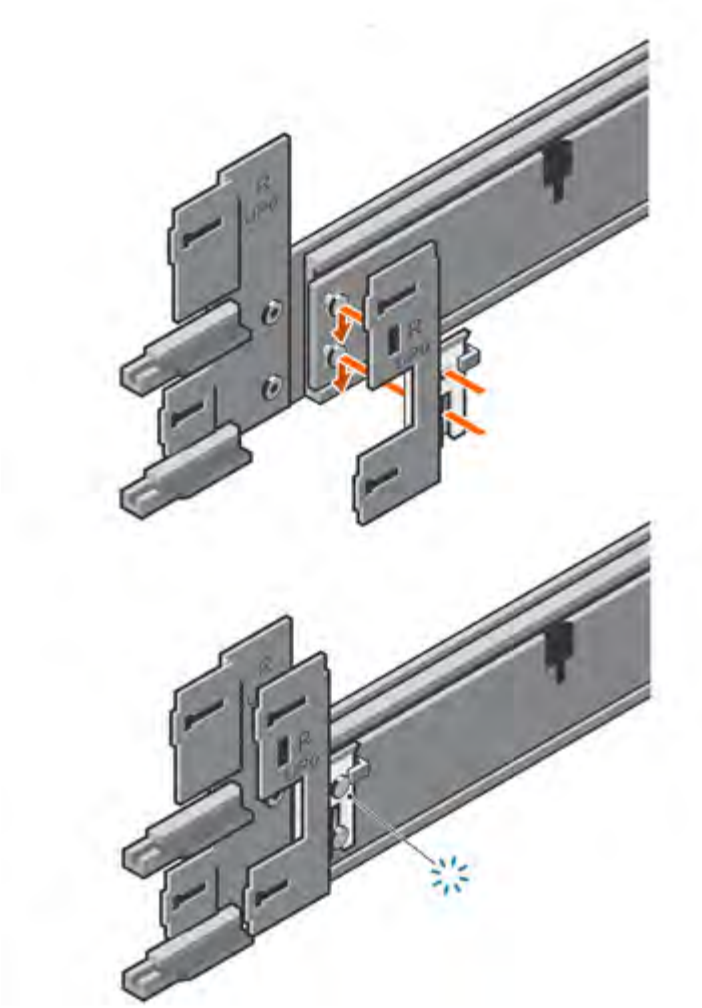
Figure 85 Attach outer CMA bracket to the rails



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

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

Figure 86 Attach inner CMA bracket to the rails



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

Install the rails

About this task

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

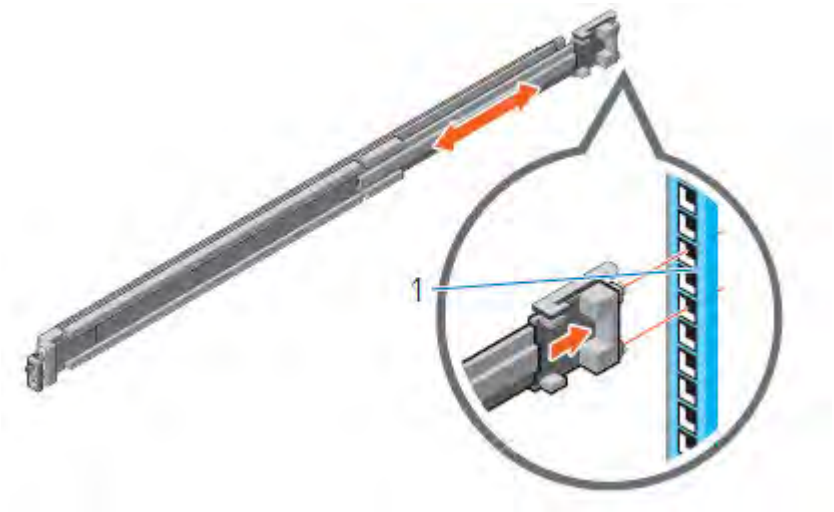
Procedure

1. Determine where to mount the system, and mark the location at the front and back of the cabinet.

   Note: Install the left rail assembly first.

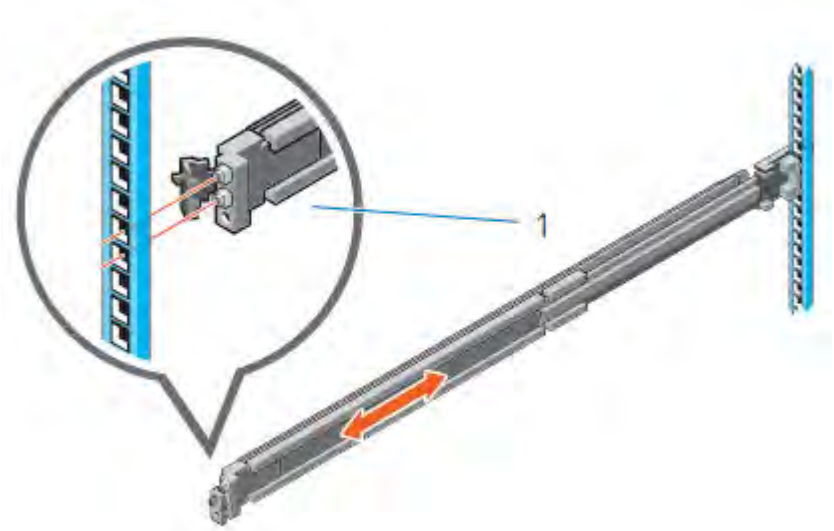
2. Fully extend the rear sliding bracket of the rail.
3. Position the rail end piece labeled **Left Front** facing inward and orient the rear end piece to align with the holes on the rear cabinet flanges.
4. Push the rail straight toward the rear of the rack until the latch locks in place.

Figure 87 Installing the rear end of the rail



5. For the front end piece, rotate the latch outward and pull the rail forward until the pins slide into the flange, and release the latch to secure the rail in place.

Figure 88 Installing the front end of the rail



6. Repeat the preceding steps to install the right rail assembly.

Secure the rail assemblies to the cabinet

The supplied screws and washers are used to secure the rail assemblies to the front and rear of the cabinet.

About this task

Note: For square hole cabinets, install the supplied conical washer before installing the screw. For unthreaded round hole cabinets, install only the screw without the conical washer.

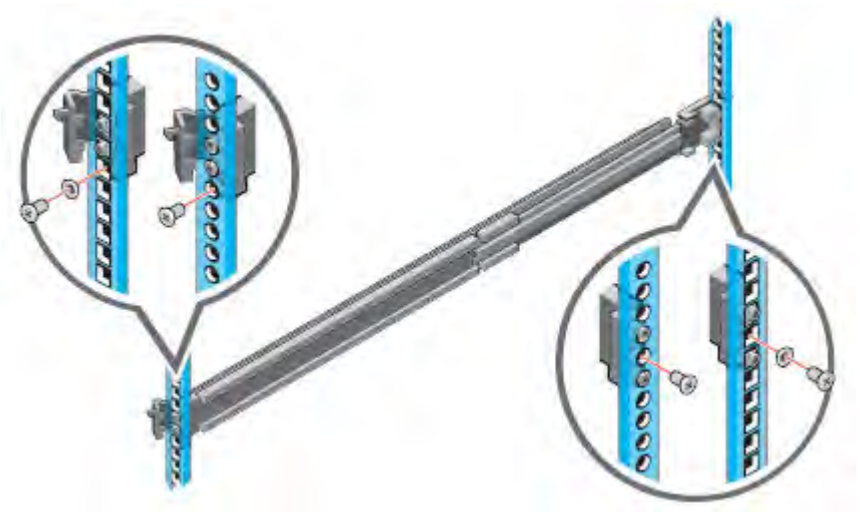
Procedure

1. Align the screws with the designated U spaces on the front and rear rack flanges.

Ensure that the screw holes on the tab of the system retention bracket are seated on the designated U spaces.

2. Insert and tighten the two screws using the Phillips #2 screwdriver.

Figure 89 Installing screws



Install the system in the cabinet

This procedure is used to install the system in the cabinet.

About this task

WARNING The system is heavy and should be installed in a cabinet by two people. 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.

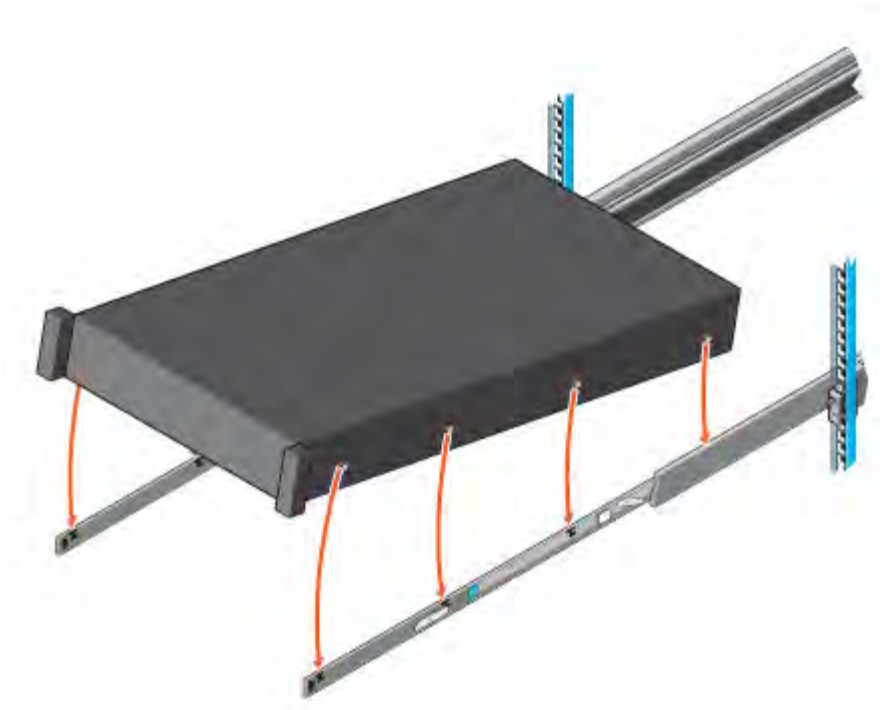
Procedure

1. At front of the cabinet, pull the inner slide rails out of the cabinet until they lock into place.

Figure 90 Pull the inner rails out of the cabinet

2. Locate the rear rail standoff on each side of the system. Position the system above the rails and lower the rear rail standoffs into the rear J-slots on the slide assemblies.
3. Rotate the system downward until all the rail standoffs are seated in the J-slots.

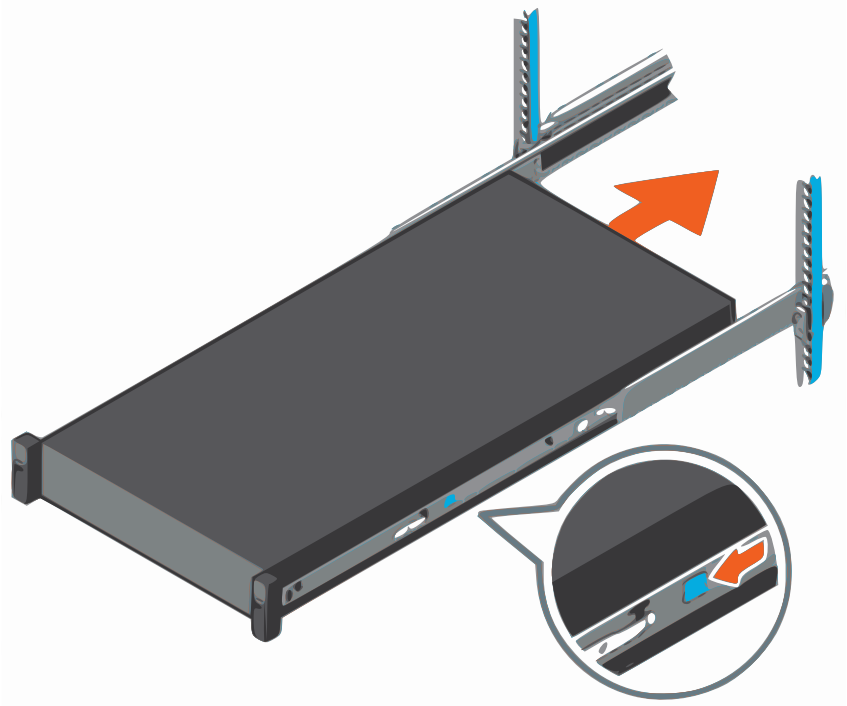
Figure 91 Install the system in the rails



4. Push the system inward until the lock levers click into place.
5. Pull the blue slide release lock tabs forward on both rails and slide the system into the cabinet. The slam latches will engage to secure the system in the cabinet.

Note: Ensure that the inner rail slides completely into the middle rail. The middle rail locks if the inner rail is not fully engaged.

Figure 92 Slide the system into the cabinet



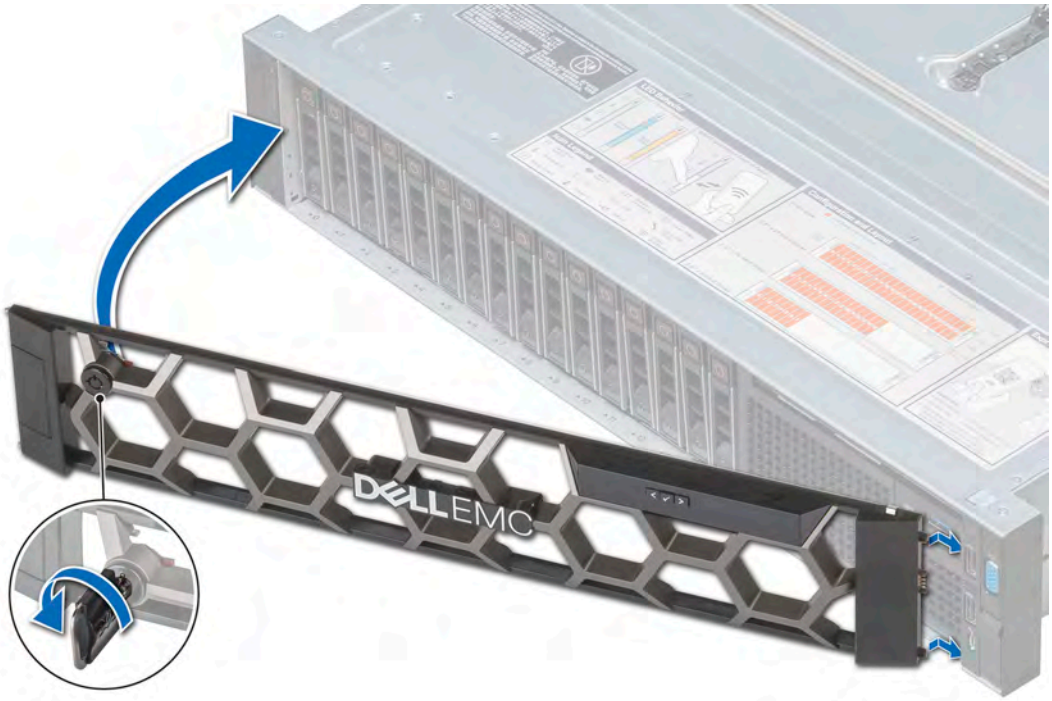
Install the front bezel

The procedure to install the front bezel with the LCD panel and the front bezel without the LCD panel is the same.

Procedure

1. Align and insert the right end of the bezel onto the system.
2. Press the release button and fit the left end of the bezel onto the system.
3. Lock the bezel by using the key.

Figure 93 Installing the front bezel

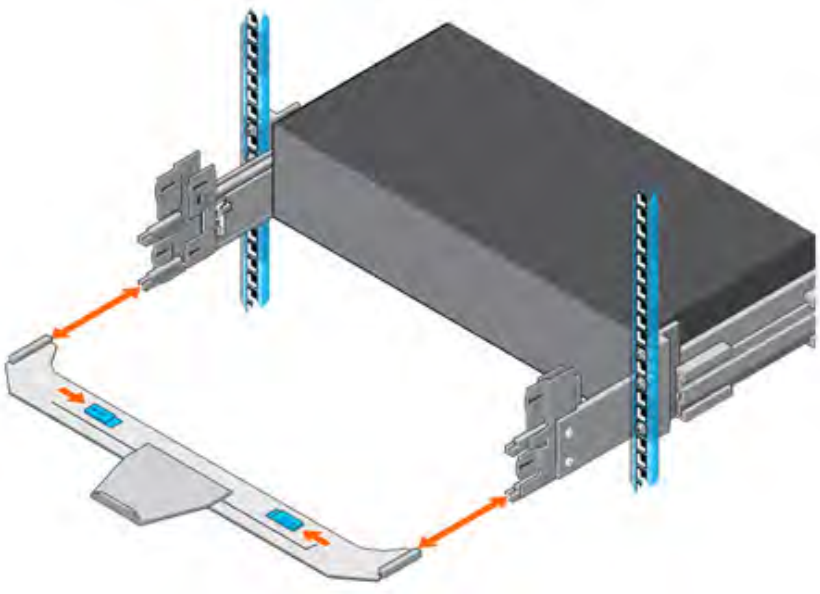


Install the CMA arms

Procedure

1. Install the first separator on the bracket.

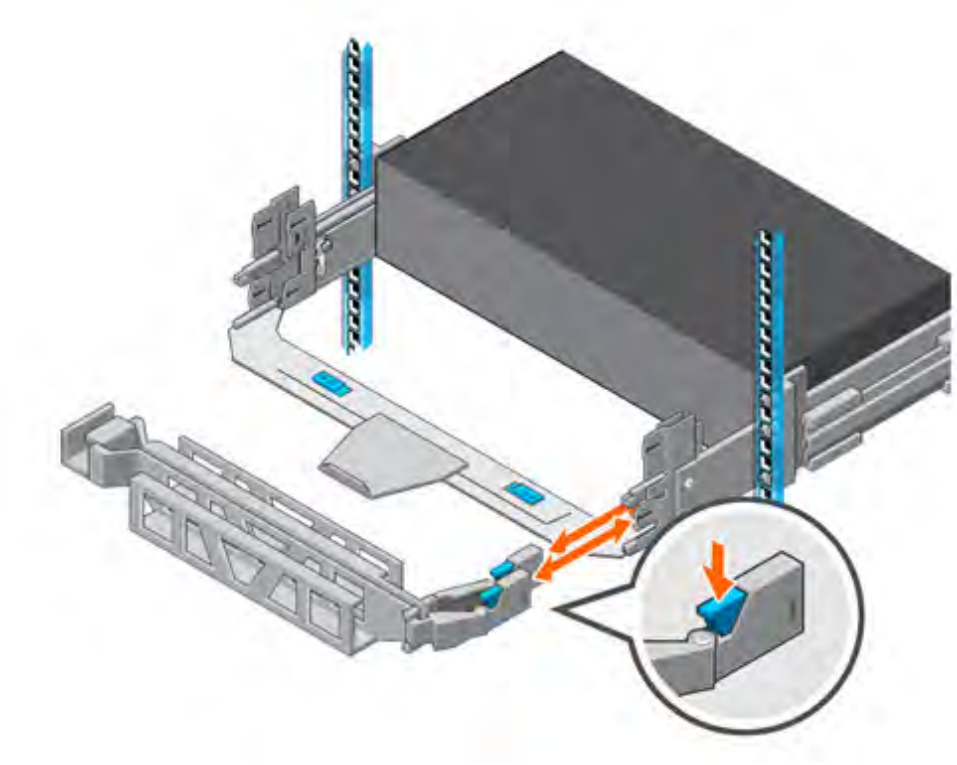
Figure 94 Install the first separator



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

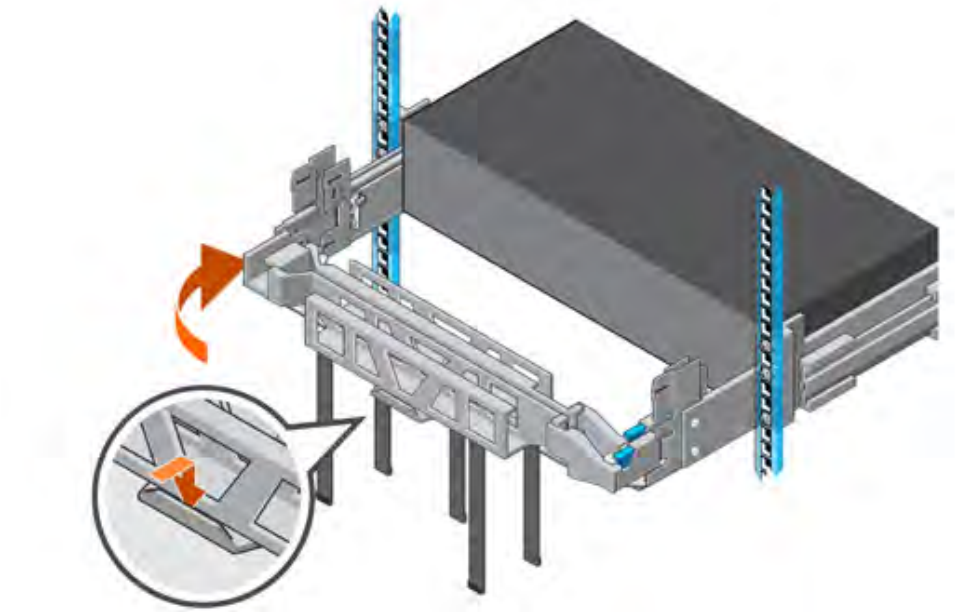
   Note: The arms are reversible.

Figure 95 Install the first arm



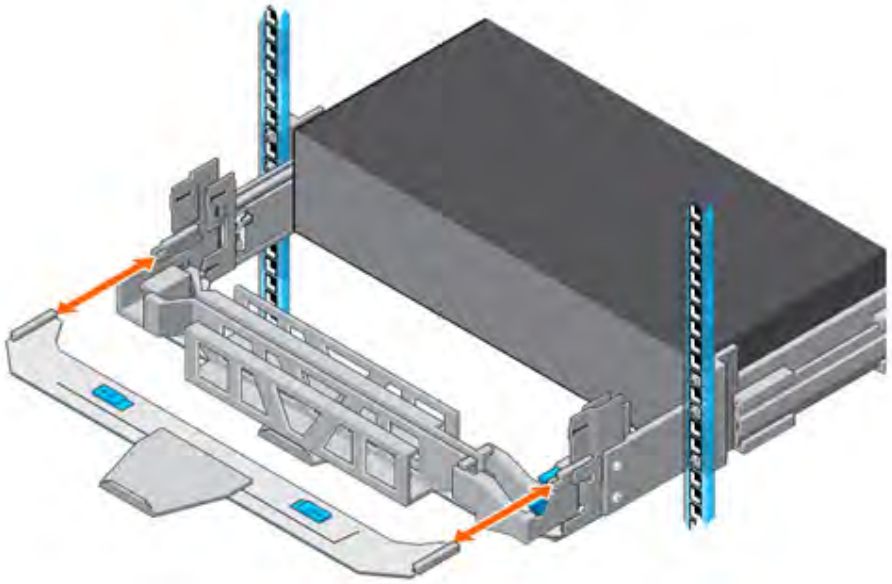
3. Close the first arm by connecting it to the bracket on the left side of the chassis.

Figure 96 Close the first arm



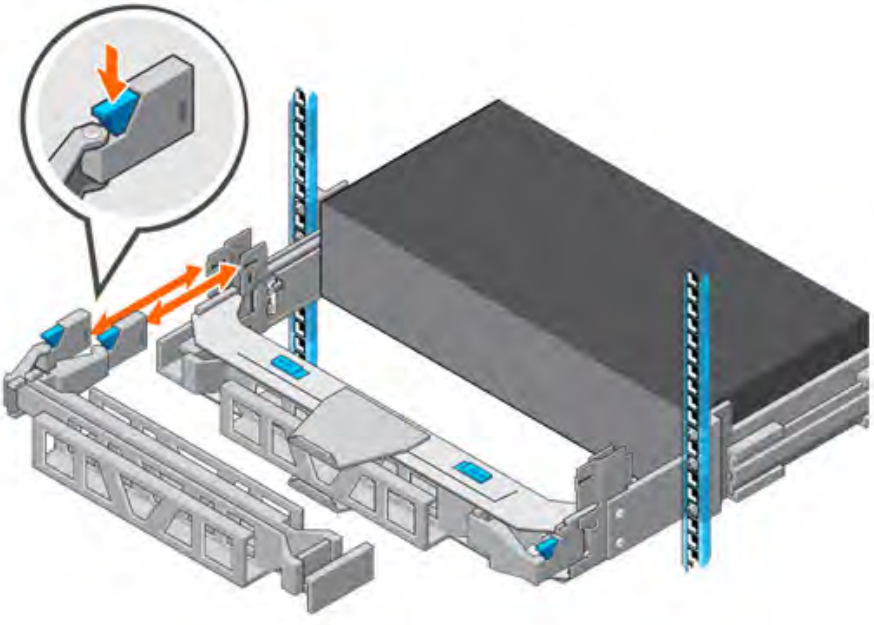
4. Install the second separator on top of the first arm .

Figure 97 Install the second separator



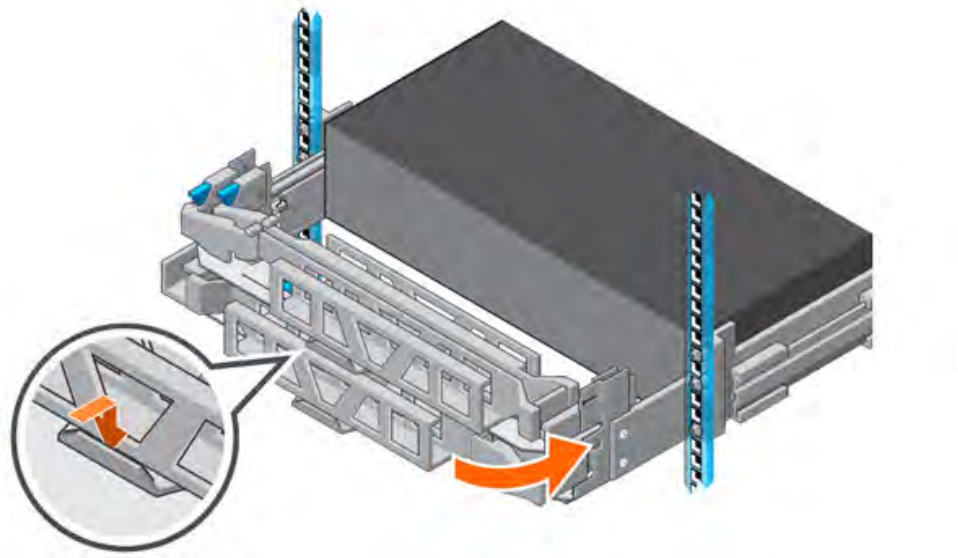
5. Install the second arm on the left side of the chassis, on top of the separator with the open side up.

Figure 98 Install the second arm



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

Figure 99 Close the second arm

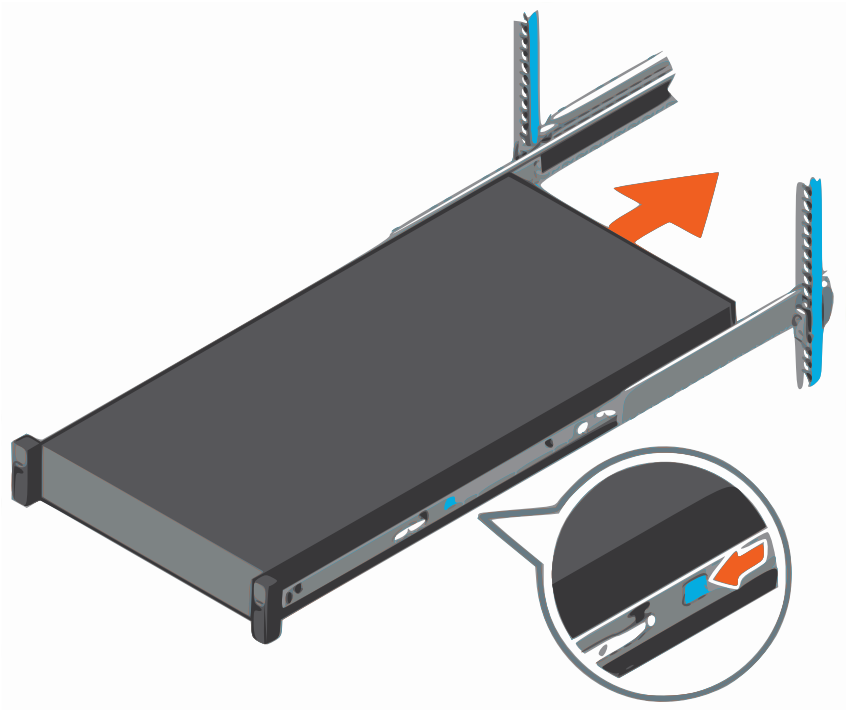


Slide the system into the cabinet

Procedure

1. At the front of the cabinet, push the system inward until the lock levers click into place.
2. Push the blue slide release lock tabs forward on both rails and slide the system into the cabinet. The slam latches will engage to secure the system in the cabinet.

Figure 100 Slide the system into the cabinet



Reconnect and power on the system

About this task

Complete the following steps to reconnect cables, power on the system, and reconnect a terminal session.

Procedure

1. Use the cable labels to reconnect the cables in the same configuration as they were before starting the replacement procedure.
2. Close the cable management arms.
3. Reconnect the serial console cable to the system serial port, and prepare the terminal session.
4. Reconnect the AC power cords to the power supplies.

   Note: The system may not power on automatically after plugging in the AC power cords.

5. If the system does not power on when the AC power cords were reconnected, press the power button on the right control panel at the front of the system.

6. When the system boots, log in as sysadmin.