DELLEMC

Dell EMC Integrated Data Protection Appliance DP4400

Version 2.3

Service Procedures

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CHAPTER 1

Prepare for assembly replacement

This chapter contains the following topics:

Hardware replacement overview

Some hardware components of the Integrated Data Protection Appliance (IDPA) DP4400 can be replaced without shutting down the system, and some hardware components require a system shutdown to replace.

The target audience for this document is resources who are responsible for replacing IDPA DP4400 components.

The following table lists the IDPA DP4400 components and whether it is required that they be shut down while being replaced. To replace one of these components, go to the required replacement procedure.

Table 1 IDPA DP4400 component replacement shutdown requirements

Model	Component shutdown is not required	Component shutdown is required
Dell PowerEdge R740 server	- Front disk drive - Rear disk drive - Internal disk drive - Power supply - Fans	- DIMMs - Network daughter card - NIC cards - Boss card M2 storage - NVMe card

Memory optimized (independent channel) mode

This mode supports Single Device Data Correction (SDDC) only for memory modules that use x4 device width. It does not impose any specific slot population requirements.

Product serial number tag

You can identify your system using the unique product serial number tag (PSNT). The PSNT is attached to the rear of the system. This information is used to route support calls to the appropriate personnel.

Figure 1 Product serial number tag

(i) **Note:** The PSNT may contain multiple serial number stickers. The serial number for the DP4400 is on a white sticker that has a part number starting with `900` printed on it.

Shut down the IDPA

You can shut down the IDPA appliance from the ACM console.

Before you begin

- Ensure that there are no backup jobs running on the Avamar Backup Server.

  (i) **Note:**

  - If there are backup jobs running on Avamar Backup Server when the IDPA appliance shutdown operation is in progress, the shutdown operation waits for the Avamar jobs to complete with the status `Waiting for shutdown of Backup Server`.

  - It is recommended that you wait for the backup jobs to complete. However, if you must shut down the appliance immediately, and then you must log in to the Avamar UI and cancel the backup jobs that are in progress.

- Shutting down the IDPA appliance requires physical intervention or the use of iDRAC to restart the system. If you are remotely shutting down the IDPA appliances, ensure that either you have physical access to the system or have configured iDRAC on the system.

About this task

To shut down IDPA, perform the following actions:

Procedure

1. On the ACM dashboard **Home** tab, click the **Shutdown Appliance** icon.

2. Enter the ACM root password, and click **Yes**.

   The appliance shut down progress is displayed.
   The IDPA appliance shuts down the components in the following order:

   - Backup Server

   - Search

   - Reporting and Analytics

   - System Manager

   - Cloud Disaster Recovery Agent

   - Protection Storage

- Appliance Configuration Manager
- vCenter Server
- Compute Node

If the ACM-initiated shutdown fails to shut down the **Backup Server** and the **Protection Storage** or both, then the ACM displays a message listing the component(s) that failed to shut down. The ACM then continues to shut down the other components.

If any components fail to shut down, you must manually shut down the components. For more information about manual shut down of IDPA components, see Troubleshooting shut down.

Troubleshooting shutdown of the DP4400

If any part of the shutdown process fails to complete automatically, troubleshoot as follows.

Procedure

1. Login to the Avamar server with SSH by using the Avamar IP address.

2. Create a checkpoint by running the following command:

   `mccli checkpoint create --override_maintenance_scheduler`

3. Verify that the checkpoint was created by running the following command:

   `status.dpn`

4. Stop all Avamar services by running the following command:

   `dpnctl stop all`

5. Log in to the Data Domain with SSH using the Data Domain IP address.

6. Shut down the Data Domain system by running the following command:

   `system poweroff`

7. Open the vCenter by typing the IP address in the browser.

8. Log in to vCenter by using the customer-specified username and password. If the ACM is down, connect to VC and ESX using username "idpauser" and appliance password as a password.

9. Power off the Data Protection virtual application.

   All virtual machines and virtual applications under the Data Protection virtual application are automatically shut down.

10. Shut down the IDPA Virtual Machine guest operating system, and power off the virtual machine.

11. Log in to the ESXi server on which the vCenter resides.

12. Log in to each ESXi host.

13. Place each ESXi host into maintenance mode by running the following command on each host:

    `esxcli system maintenanceMode set -e true -m noAction`

14. Use the vSphere Client or the ESXi host to shut down all of the ESXi hosts.

CHAPTER 2

Remove and replace assemblies

This chapter contains the following topics:

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.

Using the ACM Health dashboard to monitor the DP4400

You can access the appliance configuration manager (ACM) Health dashboard to monitor the health of the DP4400. For each device, the interface displays alerts for the system. Clicking an alert provides additional details.

Figure 2 IDPA DP4400 web user interface
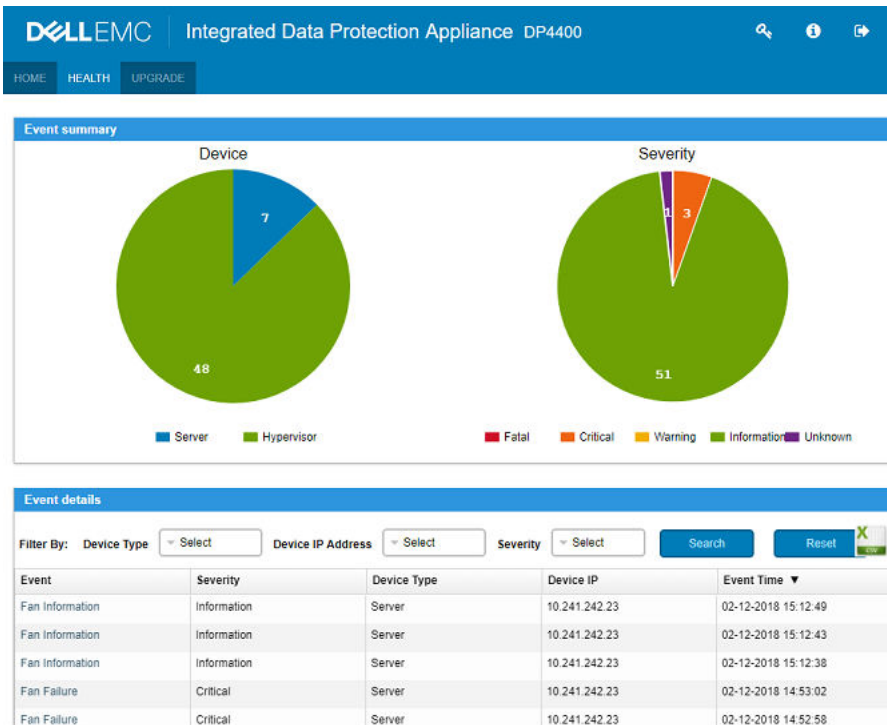
Remove and replace power supply

Power supply units

The power supply unit (PSU) is an internal hardware component which supplies power to the components in the system.

Your system supports two 750 W Mixed Mode HVDC PSUs.

You do not need to shut down the system to replace a power supply unit.

⚠ CAUTION If two PSUs are installed, both the PSUs must have the same type of label. For example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the same power rating. Mixing PSUs will result in mismatch condition or failure to turn the system on.

Power supply status indicators

Status LED indicators

ⓘ Note: The status LED indicators are always off and only turn on to a solid amber if any error occurs.

Table 2 Status LED indicators and descriptions

Icon	Description	Condition	Corrective action
🗄	Drive indicator	The indicator turns solid amber if there is a drive error.	• Check the System Event Log to determine if the drive has an error. • Run the appropriate Online Diagnostics test. Restart the system and run embedded diagnostics (ePSA). • If the drives are configured in a RAID array, restart the system, and enter the host adapter configuration utility program.
🌡	Temperature indicator	The indicator turns solid amber if the system experiences a thermal error (for example, the ambient temperature is out of range or there is a fan failure).	Ensure that none of the following conditions exist: • A cooling fan has been removed or has failed. • System cover, air shroud, memory module blank, or back filler bracket is removed. • Ambient temperature is too high. • External airflow is obstructed.
⚡	Electrical indicator	The indicator turns solid amber if the system experiences an electrical error (for example, voltage out of range, or a failed power supply unit (PSU) or voltage regulator).	Check the System Event Log or system messages for the specific issue. If it is due to a problem with the PSU, check the LED on the PSU. Reseat the PSU.
▨	Memory indicator	The indicator turns solid amber if a memory error occurs.	Check the System Event Log or system messages for the location of the failed memory. Reseat the memory module
▭	PCIe indicator	The indicator turns solid amber if a PCIe card experiences an error.	Restart the system. Update any required drivers for the PCIe card. Reinstall the card.

Power supply unit indicator codes

AC power supply units (PSUs) have an illuminated translucent handle that serves as an indicator. The indicator shows whether power is present or a power fault has occurred.
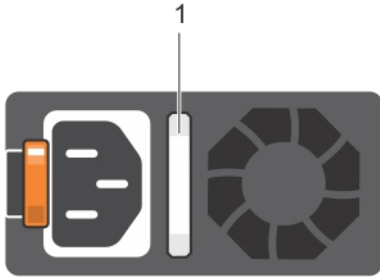
1. AC PSU status indicator/handle

This table describes the AC PSU status indicators and what condition is the PSU when the power indicator light is green, blinking green, blinking amber, and when it is not lit.

Power indicator codes	Condition
Green	A valid power source is connected to the PSU and the PSU is operational.
Blinking amber	Indicates a problem with the PSU.
Not illuminated	Power is not connected to the PSU.
Blinking green	When the firmware of the PSU is being updated, the PSU handle blinks green. △ CAUTION Do not disconnect the power cord or unplug the PSU when updating firmware. If firmware update is interrupted, the PSUs do not function.
Blinking green and turns off	When hot-plugging a PSU, the PSU handle blinks green five times at a rate of 4 Hz and turns off. This indicates a PSU mismatch with respect to efficiency, feature set, health status, or supported voltage. △ CAUTION If two PSUs are installed, both the PSUs must have the same type of label; for example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition or failure to turn the system on. △ CAUTION When correcting a PSU mismatch, replace only the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition and unexpected system shutdown. To change from a high output configuration to a low output configuration or vice versa, you must turn off the system. △ CAUTION AC PSUs support both 240 V and 120 V input voltages with the exception of Titanium PSUs, which support only 240 V. When two identical PSUs receive different input voltages, they can output different wattages, and trigger a mismatch. △ CAUTION If two PSUs are used, they must be of the same type and have the same maximum output power. △ CAUTION Combining AC and DC PSUs is not supported and triggers a mismatch.

Remove and replace a power supply

Identifying a failed power supply from the ACM

If a power supply is suspected of failing, you can check the web UI or use the FRU command line verification from the ACM.

Procedure

1. Access the IDPA web UI and check for alerts in the Health screen. Click an alert for more details.

2. Log in to the ACM command line by using SSH.

   Use `root` for the user, and use the common password for the appliance.

3. At the command line, type the following command: `# showfru power`

   The screen displays that the system is collecting data. When the data collection is completed, a screen similar to the following displays status information for the power supplies.

```
Collecting Data............
_____
| ID| Status| Redundancy| Model                     |  FW Version|
|===============================================================|
| 1 | Failed| Fault     | PWR SPLY,750W,RDNT,ARTESYN|  00.1B.53  | *
| 2 | OK    | Single    | PWR SPLY,750W,RDNT,ARTESYN|  00.1B.53  |
```

In this example, power supply 1 is identified as failed and should be replaced.

Remove the power supply unit

Before you begin

⚠ CAUTION The system needs one power supply unit (PSU) for normal operation. Since the DP4400 is a power-redundant system, remove and replace only one PSU at a time in a system that is powered on.

1. Follow all safety guidelines.
2. Unlatch and lift the optional cable management arm if it interferes with the PSU removal.

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 and hold the release latch, and slide the PSU out of the system by using the PSU handle.

Figure 3 Removing a power supply unit
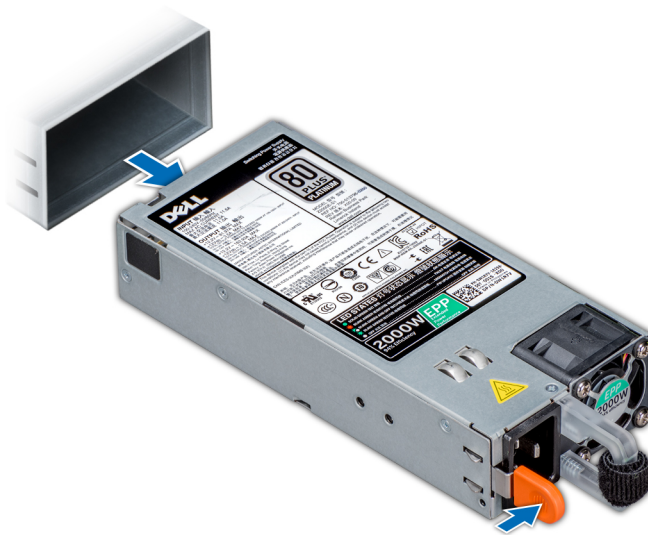
Replace a power supply unit

Before you begin

For systems that support redundant PSU, ensure that both the PSUs are of the same type and have the same maximum output power.

(i) | **Note:** The maximum output power (shown in watts) is listed on the PSU label.

Procedure

1. Slide the PSU into the system until the PSU is fully seated and the release latch snaps into place.

2. If you have unlatched the cable management arm, relatch it.

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.

   (i) | **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.

Figure 4 Installing a power supply unit
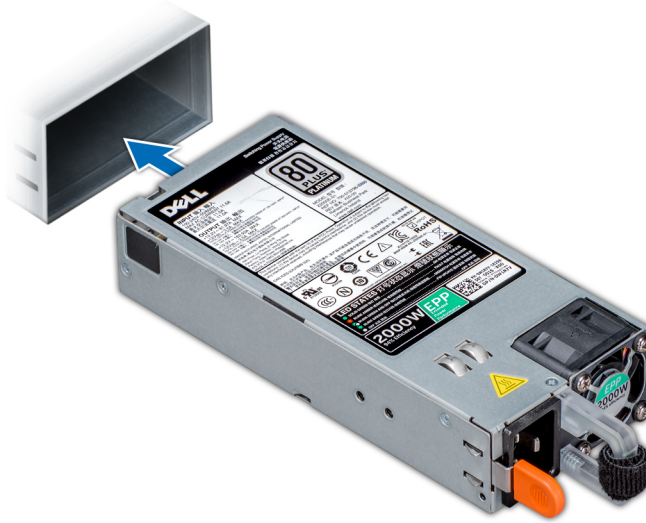
Verifying successful power supply replacement from the ACM

After a power supply is replaced, you can run the FRU command line verification from the ACM to ensure that the replacement was successful.

Procedure

1. From the ACM, type the following command: `# showfru power`

   The screen displays that the system is collecting data. When the data collection is completed, a screen similar to the following displays status information for the power supplies.

```
acme-dp4400-ACM:~ # showfru power
Collecting Data............
_____
| ID| Status| Redundancy| Model                      |  FW Version|
|==============================================================|
| 1 | OK    | Full      | PWR SPLY,1100W,RDNT,ARTESYN|  00.1B.53  | *
| 2 | OK    | Full      | PWR SPLY,1100W,RDNT,ARTESYN|  00.1B.53  |
```

2. Verify that the status for both power supplies is "OK".

Hard drive replacement overview

Hard drives

Hard drives are supplied in hot swappable hard drive carriers that fit in the hard drive slots. You do not need to shut down the system to replace a hard drive.

⚠ CAUTION Before attempting to remove or install a hard drive while the system is running, see the documentation for the storage controller card to ensure that the host adapter is configured correctly.

⚠ CAUTION Do not turn off or restart your system while a hard drive is being formatted. Doing so can cause a hard drive failure.

When you format a hard drive, allow enough time for the formatting to complete. Be aware that high-capacity hard drives can take a long time to format.

Identify a faulted hard drive

Use the following information to identify a faulted hard drive:

- At the front of the system, check the left control panel Drive indicator ▯ as described in Status LED indicators on page 13.
- On the hard drive, check the status indicator as described in #unique_24

Status LED indicators

ⓘ Note: The status LED indicators are always off and only turn on to a solid amber if any error occurs.

Table 3 Status LED indicators and descriptions

Icon	Description	Condition	Corrective action
▯	Drive indicator	The indicator turns solid amber if there is a drive error.	- Check the System Event Log to determine if the drive has an error. - Run the appropriate Online Diagnostics test. Restart the system and run embedded diagnostics (ePSA). - If the drives are configured in a RAID array, restart the system, and enter the host adapter configuration utility program.
🌡	Temperature indicator	The indicator turns solid amber if the system experiences a thermal error (for example, the ambient temperature is out of range or there is a fan failure).	Ensure that none of the following conditions exist: - A cooling fan has been removed or has failed. - System cover, air shroud, memory module blank, or back filler bracket is removed. - Ambient temperature is too high. - External airflow is obstructed.
⚡	Electrical indicator	The indicator turns solid amber if the system experiences an electrical error (for example, voltage out of range, or a failed power supply unit (PSU) or voltage regulator).	Check the System Event Log or system messages for the specific issue. If it is due to a problem with the PSU, check the LED on the PSU. Reseat the PSU.

Table 3 Status LED indicators and descriptions (continued)

Icon	Description	Condition	Corrective action
	Memory indicator	The indicator turns solid amber if a memory error occurs.	Check the System Event Log or system messages for the location of the failed memory. Reseat the memory module
	PCIe indicator	The indicator turns solid amber if a PCIe card experiences an error.	Restart the system. Update any required drivers for the PCIe card. Reinstall the card.

Hard drive indicator codes

Each hard drive carrier has an activity LED indicator and a status LED indicator. The indicators provide information about the current status of the hard drive. The activity LED indicator indicates whether the hard drive is currently in use or not. The status LED indicator indicates the power condition of the drive.

Figure 5 Hard drive indicators
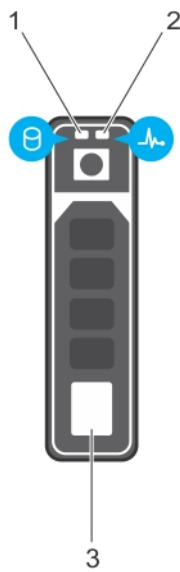
1. hard drive activity LED indicator

2. hard drive status LED indicator

3. hard drive

The hard drive indicator codes table describes the indicator codes: flashing green, steady green, and amber.

Table 4 Hard drive indicator codes

Hard drive status indicator code	Condition
Flashes green twice per second	Identifying drive or preparing for removal.
Off	Drive ready for removal.

Table 4 Hard drive indicator codes (continued)

Hard drive status indicator code	Condition
	(i) **Note:** The drive status indicator remains off until all drives are initialized after the system is turned on. Drives are not ready for removal during this time.
Flashes green, amber, and then turns off	Predicted drive failure.
Flashes amber four times per second	Drive failed.
Flashes green slowly	Drive rebuilding.
Solid green	Drive online.
Flashes green for three seconds, amber for three seconds, and then turns off after six seconds	Rebuild stopped.

Identifying a failed disk from the ACM

If a disk is suspected of failing, you can check the web UI or use the FRU command line verification from the ACM.

Procedure

1. Access the IDPA web UI and check for alerts in the Health screen. Click an alert for more details.

2. Log in to the ACM command line by using SSH.

   Use `root` for the user, and use the common password for the appliance.

3. At the command line, type the following command: `# showfru disk`

   The screen displays that the system is collecting data. When the data collection is completed, a screen similar to the following displays status information for the disks.

```
acme-dp4400-ACM:~ # showfru disk
Collecting Data............

_____
| ID| State   | Status| FW Version| Capacity| Operation| OpStatus|
|=================================================|
| 0 | Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 1 | Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 2 | Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 3 | Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 4 | Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 5 | Offline | ERROR | NS01      | 10.69TB | None     | 0%      | *
| 6 | Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 7 | Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 8 | Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 9 | Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 10| Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 11| Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 12| Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 13| Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 14| Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 15| Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 16| Online  | OK    | NS01      | 10.69TB | None     | 0%      |
| 17| Online  | OK    | NS01      | 10.69TB | None     | 0%      |
```

In this example, disk 5 is identified as failed and should be replaced.

Hard drive access

For the DP4400 24-96 TB configuration, hard drives 0-11 are installed in the front panel, and hard drives 12-13 are installed in the rear panel.

For the DP4400 8-24 TB configuration, hard drives 0-3 are installed in the front panel, and hard drives 12-13 are installed in the rear panel.

Hard drives 14-17 are internal.

You must remove the front bezel to access the drives in the front panel.

Figure 6 Front panel hard drives

Figure 7 Rear panel hard drives

Figure 8 Internal Hard drives

Remove front and rear hard drives

Remove the front bezel to access front panel hard drives

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

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
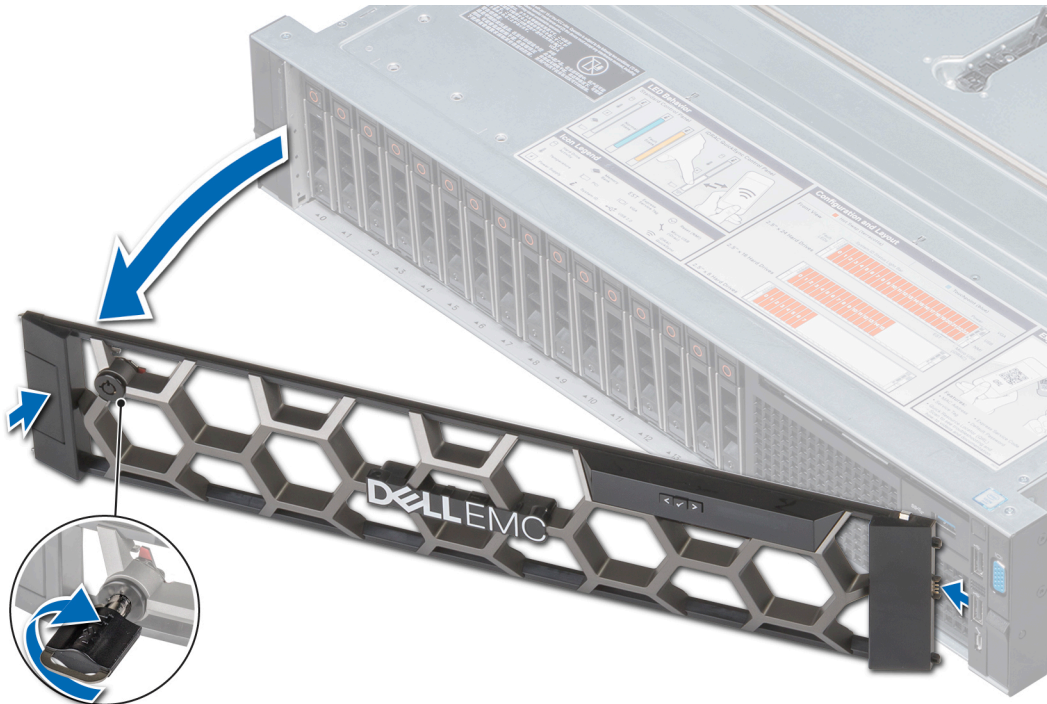
Remove the hard drive

Before you begin

1. Follow all safety guidelines.

2. If applicable, remove the front bezel.

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 drives

Before you begin

⚠ CAUTION Before attempting to remove or install a hard drive while the system is running, see the documentation for the storage controller card to ensure that the host adapter is configured correctly to support hard drive removal and insertion.

⚠ CAUTION Mixing hard drives from previous generations of PowerEdge servers is not supported.

⚠ CAUTION SATA hard drives are not supported in the DP4400.

⚠ CAUTION When installing a hard drive, ensure that the adjacent drives are fully installed. Inserting a hard drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.

⚠ CAUTION When a replacement hot swappable hard drive is installed and the system is powered on, the hard drive automatically begins to rebuild. Ensure that the replacement hard drive is blank or contains data that you wish to overwrite. Any data on the replacement hard drive is immediately lost after the hard drive is installed.

1. Follow all safety guidelines.
2. If applicable, remove the hard drive blank.

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

When the system is powered on, the hard drive automatically begins to rebuild. This process can take up to 8 hours to complete.

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 12 Installing the front bezel

Verifying successful disk replacement from the ACM

After a disk is replaced, you can run the FRU command line verification from the ACM to ensure that the replacement was successful.

Procedure

1. Log in to the ACM command line by using SSH.

   Use **root** for the user, and use the common password for the appliance.

2. Type the following command: `# showfru disk`

```
acme-dp4400-ACM:~ # showfru disk
Collecting Data............

| ID| State | Status|  FW Version| Capacity| Operation| OpStatus|
|================================================================|
| 0 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 1 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 2 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 3 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 4 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 5 | Online| OK    |  NS01      | 10.69TB | Rebuild  | 65%     |     *
| 6 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 7 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 8 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 9 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 10| Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 11| Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 12| Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 13| Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 14| Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 15| Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 16| Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 17| Online| OK    |  NS01      | 10.69TB | None     | 0%      |
```

3. Verify the state for all disks is "Online," and that the status for all disks is "OK".

Remove internal hard drives

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 13 Removing the system cover

Remove hard drive carrier from the mid hard drive tray

Before you begin

⚠ CAUTION When a replacement hot swappable hard drive is installed and the system is powered on, the hard drive automatically begins to rebuild. Ensure that the replacement hard drive is blank or contains data that you wish to overwrite. Any data on the replacement hard drive is immediately lost after the hard drive is installed.

⚠ CAUTION Mixing hard drive carriers from previous generations of PowerEdge servers is not supported.

Procedure

1. Lift the hard drive carrier handle upward.

2. Press the release tab on the hard drive tray and lift the hard drive carrier handle upward to disengage the hard drive from the backplane.

3. Hold the hard drive carrier handle and lift the hard drive carrier out of the hard drive tray.

Figure 14 Removing hard drive carrier from the mid hard drive tray
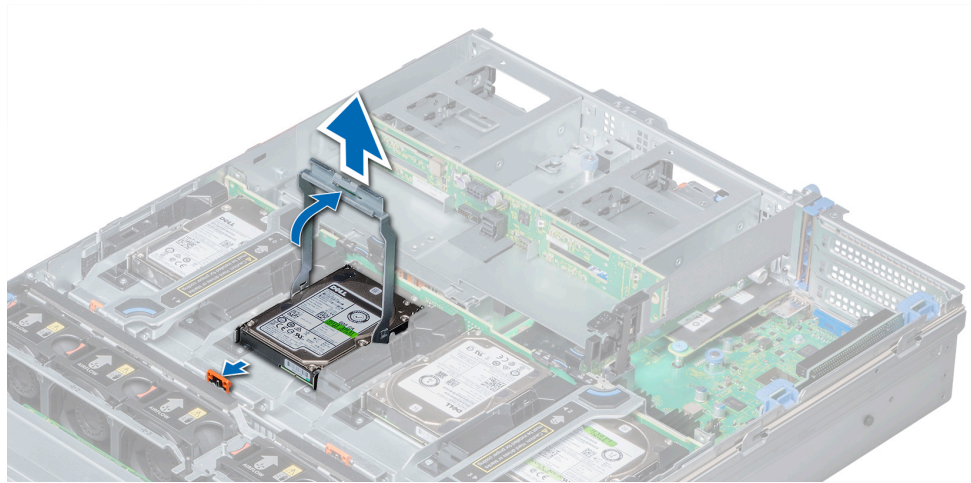
4. If you are not immediately replacing the hard drive, insert a blank in the empty hard drive slot to maintain proper system cooling.

Replace a hard drive in the mid hard drive tray

Before you begin

Procedure

1. Remove the hard drive carrier from the mid hard drive tray

   (i) **Note:** To replace a hard drive that is mounted in the mid hard drive tray, perform the following steps as applicable to the type of hard drive that is installed:

2. Replace a 3.5 inch hard drive:

   a. Remove the hard drive from the carrier.

   b. Install the hard drive into the carrier.

3. Install the hard drive carrier into the mid hard drive tray.

Remove 3.5 inch hard drive from the hard drive carrier

Before you begin

Follow all safety guidelines.

⚠ **CAUTION** To maintain proper system cooling, all empty hard drive slots must have hard drive blanks installed.

Procedure

1. Push out at the edges of the carrier to disengage the tabs on the hard drive carrier from the slots on the hard drive.

2. Lift the hard drive carrier away from the hard drive.

Figure 15 Removing 3.5 inch hard drive from the hard drive carrier
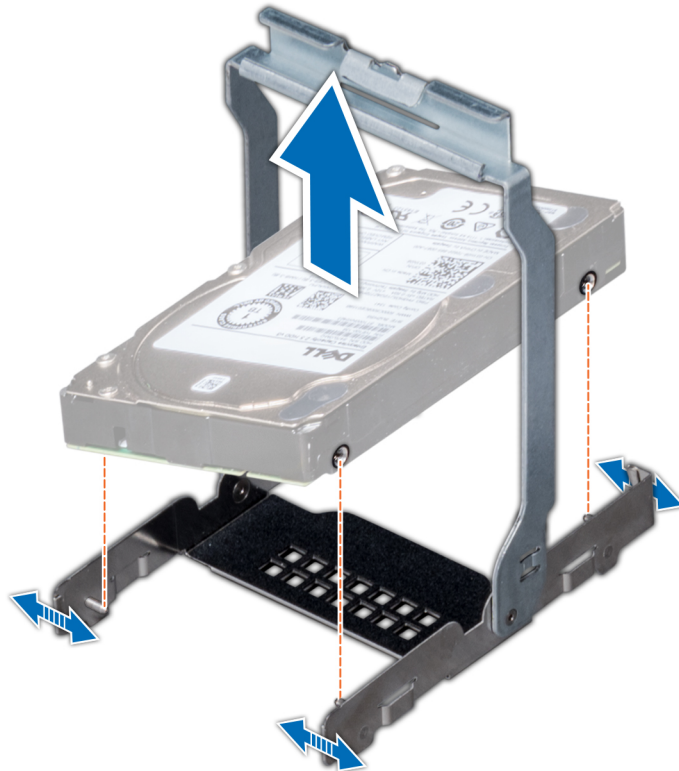
Install hard drive carrier into mid hard drive tray

Before you begin

Follow all safety guidelines.

⚠ CAUTION Use only hard drives that have been tested and approved for use with the hard drive backplane.

⚠ CAUTION When installing a hard drive, ensure that the adjacent drives are fully installed. Inserting a hard drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.

⚠ CAUTION To prevent data loss, ensure that your operating system supports hot-swap drive installation. See the documentation supplied with your operating system.

⚠ CAUTION Mixing hard drive carriers from previous generations of PowerEdge servers is not supported.

⚠ CAUTION When a replacement hot swappable hard drive is installed and the system is powered on, the hard drive automatically begins to rebuild. Ensure that the replacement hard drive is blank or contains data that you wish to overwrite. Any data on the replacement hard drive is immediately lost after the hard drive is installed.

Procedure

1. Lift the hard carrier handle.
2. If a hard drive blank is installed in the hard drive slot, remove it.
3. Insert the hard drive carrier into the hard drive tray.
4. Lower the hard drive carrier handle to engage the hard drive to the connector on the backplane and lock the hard drive in place.

Figure 16 Installing hard drive carrier into mid hard drive tray
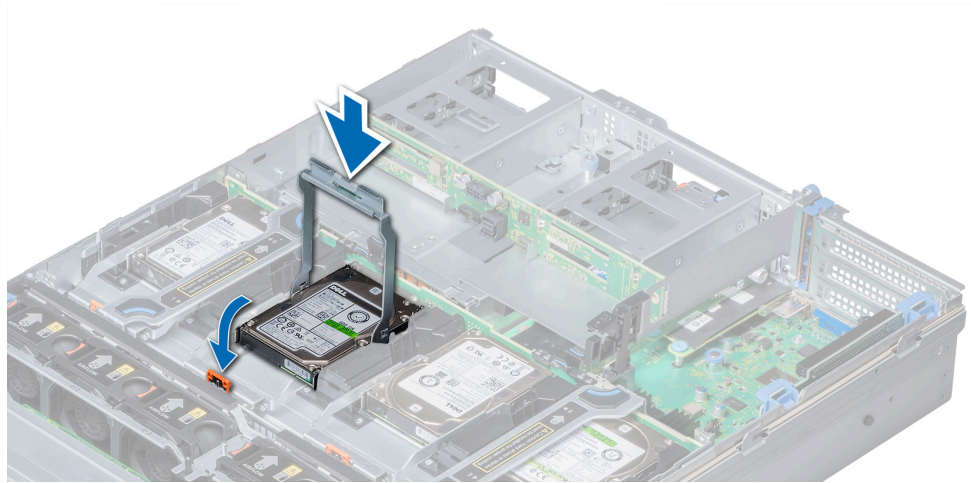
Install the system cover

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.

   Figure 17 Install the system cover

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 18 Slide the system into the cabinet

Verifying successful disk replacement from the ACM

After a disk is replaced, you can run the FRU command line verification from the ACM to ensure that the replacement was successful.

Procedure

1. Log in to the ACM command line by using SSH.

   Use `root` for the user, and use the common password for the appliance.

2. Type the following command: `# showfru disk`

```
acme-dp4400-ACM:~ # showfru disk
Collecting Data.............

_____
| ID| State | Status|  FW Version| Capacity| Operation| OpStatus|
|=============================================================|
| 0 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 1 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 2 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 3 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 4 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 5 | Online| OK    |  NS01      | 10.69TB | Rebuild  | 65%      | *
| 6 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 7 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 8 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
| 9 | Online| OK    |  NS01      | 10.69TB | None     | 0%      |
```

```
| 10| Online| OK     |   NS01     | 10.69TB | None      | 0%        |
| 11| Online| OK     |   NS01     | 10.69TB | None      | 0%        |
| 12| Online| OK     |   NS01     | 10.69TB | None      | 0%        |
| 13| Online| OK     |   NS01     | 10.69TB | None      | 0%        |
| 14| Online| OK     |   NS01     | 10.69TB | None      | 0%        |
| 15| Online| OK     |   NS01     | 10.69TB | None      | 0%        |
| 16| Online| OK     |   NS01     | 10.69TB | None      | 0%        |
| 17| Online| OK     |   NS01     | 10.69TB | None      | 0%        |
```

3. Verify the state for all disks is "Online," and that the status for all disks is "OK".

Remove fans

Cooling fans

The cooling fans are integrated into the system to dissipate the heat generated by the functioning of the system. These fans provide cooling for the processors, expansion cards, and memory modules.

Your system supports up to six standard or high performance hot swappable cooling fans. You do not need to shut down the system to replace a cooling fan.

⚠ CAUTION Mixing of standard and high performance cooling fans is not supported.

ⓘ Note: Each fan is listed in the systems management software, referenced by the respective fan number. If there is a problem with a particular fan, you can easily identify and replace the proper fan by noting the fan numbers on the cooling fan assembly.

Identifying a failed fan from the ACM

If a fan is suspected of failing, you can check the web UI or use the FRU command line verification from the ACM.

Procedure

1. Access the web UI and check for alerts in the Health screen. Click an alert for more details.

2. Log in to the ACM command line by using SSH.

   Use `root` for the user, and use the common password for the appliance.

3. At the command line, type the following command: `# showfru fan`

   The screen displays that the system is collecting data. When the data collection is completed, the screen displays status information for the fans.

```
Collecting Data............

 _____
| ID| Status| Redundancy| PWM| Reading |
|===============================|
| 1 | OK    | Full      | 36%| 9000 RPM|
| 2 | OK    | Full      | 36%| 9000 RPM|
| 3 | Error | NA        | 12%| 0237 RPM|  *
| 4 | OK    | Full      | 38%| 8880 RPM|
| 5 | OK    | Full      | 38%| 9000 RPM|
| 6 | OK    | Full      | 38%| 9000 RPM|
```

In this example, fan 3 is identified as failed and should be replaced.

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 19 Removing the system cover

Remove the cooling fan

The procedure for removing standard and high performance fans is identical.

Before you begin

⚠️ WARNING Opening or removing the system cover when the system is on may expose you to a risk of electric shock. Exercise utmost care while removing or installing cooling fans.

⚠️ CAUTION The cooling fans are hot swappable. To maintain proper cooling while the system is on, replace only one fan at a time.

Procedure

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

Figure 20 Removing cooling fan
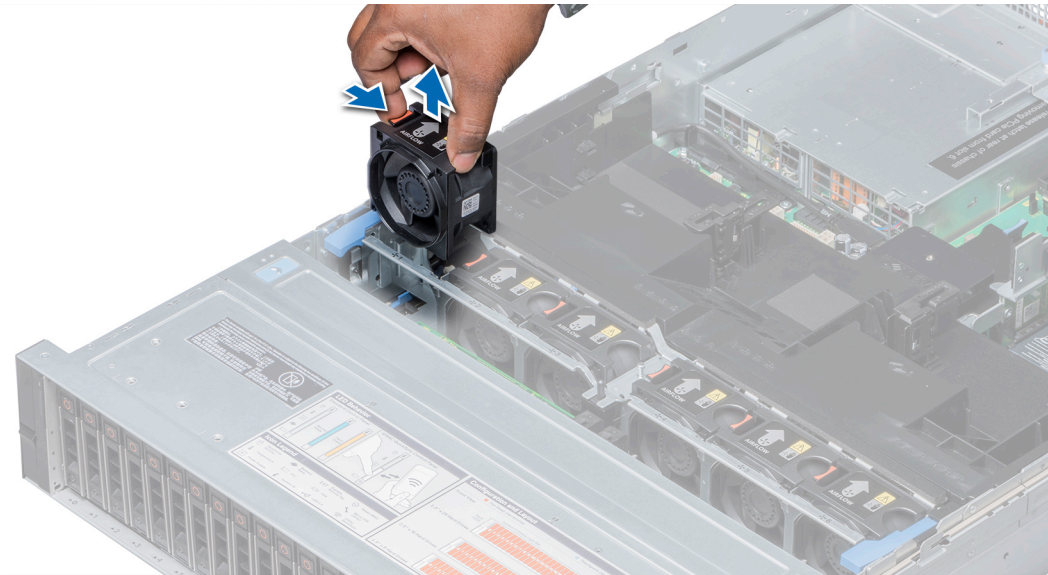
Install the cooling fan

The procedure for installing standard and high performance fans is identical.

Procedure

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

    Figure 21 Installing cooling fan
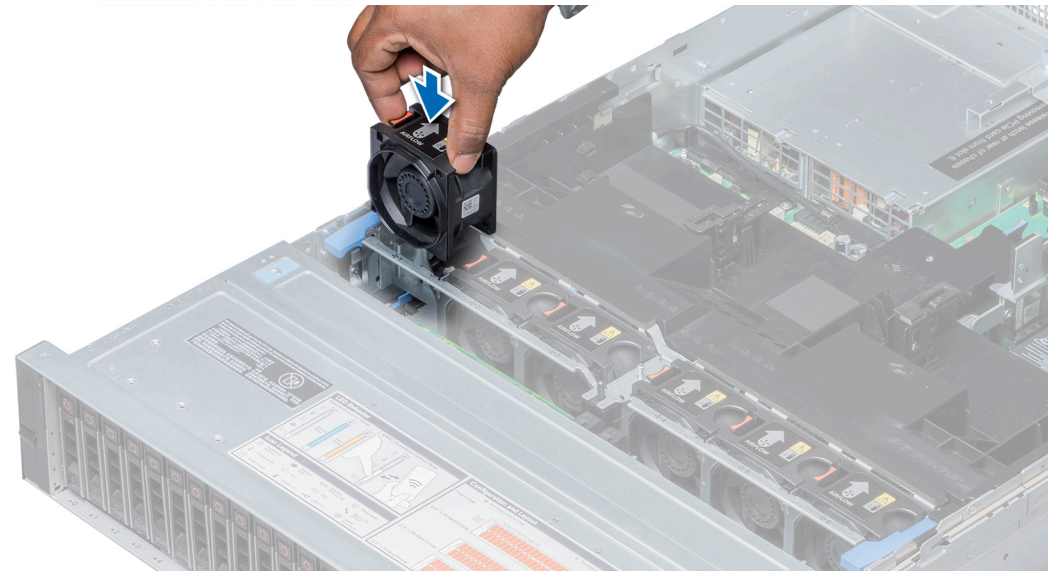
Verifying successful fan replacement from the ACM

After a fan is replaced, you can run the FRU command line verification from the ACM to ensure that the replacement was successful.

Procedure

1. From the ACM, type the following command: `# showfru fan`

The screen displays that the system is collecting data. When the data collection is completed, the screen displays status information for the fans.

```
acme-dp4400-ACM:~ # showfru fan
Collecting Data............
_____
| ID| Status| Redundancy| PWM| Reading |
|==================================|
| 1 | OK    | Full      | 36%| 9000 RPM|
| 2 | OK    | Full      | 36%| 9000 RPM|
| 3 | OK    | Full      | 36%| 9000 RPM|  *
| 4 | OK    | Full      | 38%| 8880 RPM|
| 5 | OK    | Full      | 38%| 9000 RPM|
| 6 | OK    | Full      | 38%| 9000 RPM|
```
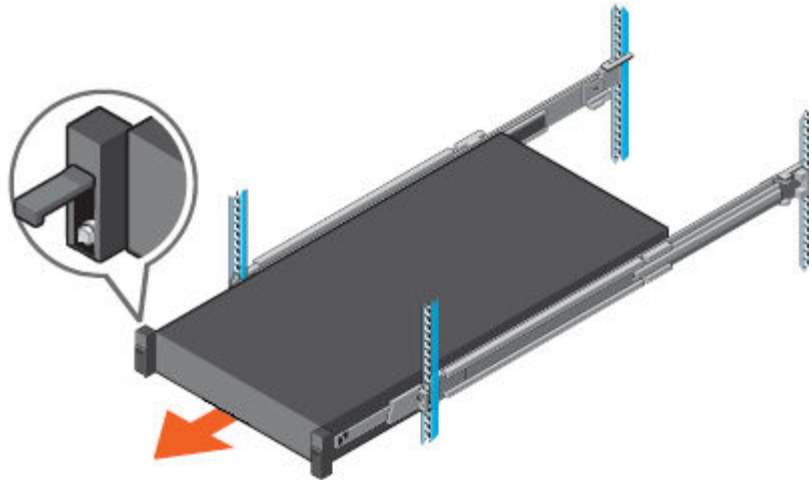
2. Verify the status for all fans is "OK".

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.

Figure 22 Install the system cover

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 23 Slide the system into the cabinet
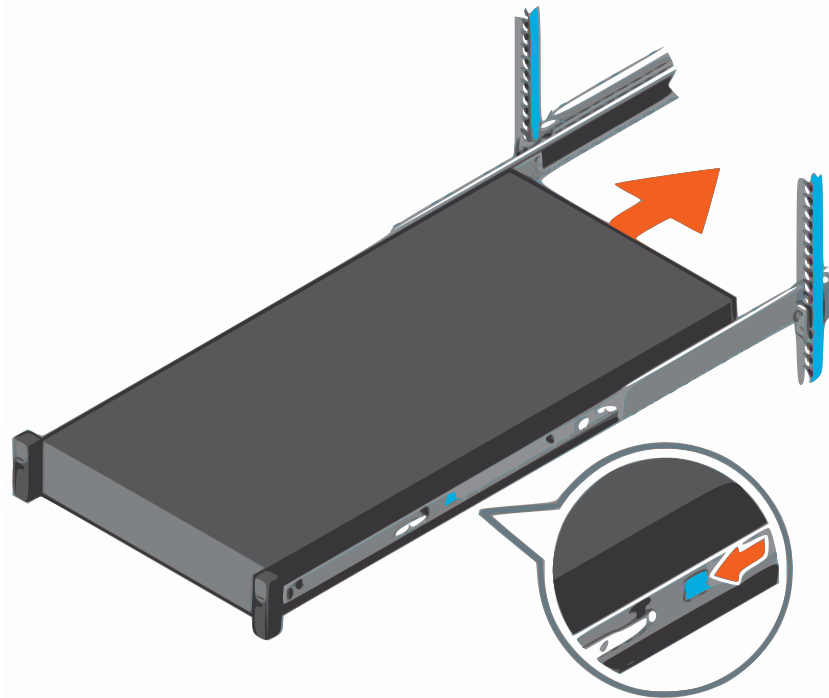
DIMM remove and replace

The following table lists the memory capacity and the number of DIMMs for the DP4400.

Table 5 DP4400 memory configuration

Memory capacity	256 GB
Number of DIMMs	8 x 32 GB

DIMMs are not hot-swappable, and require a system shutdown.

⚠ 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 using the LED indicators

ⓘ Note: The status LED indicators are always off and only turn on to a solid amber if any error occurs.

At the front of the system, check the left control panel Memory indicator (▨). The indicator turns solid amber if a memory error occurs. Check the System Event Log or system messages for the location of the failed memory, and reseat or replace the memory module.

Identifying a failed DIMM from the ACM

If a DIMM is suspected of failing, you can check the IDPA web UI or use the FRU command line verification from the ACM.

About this task

The DD4400 system has 24 memory slots distributed across two memory channels. The following figure shows the physical layout of the memory slots. The bottom of the image represents the front of the cabinet.

Figure 24 DIMM slot configuration
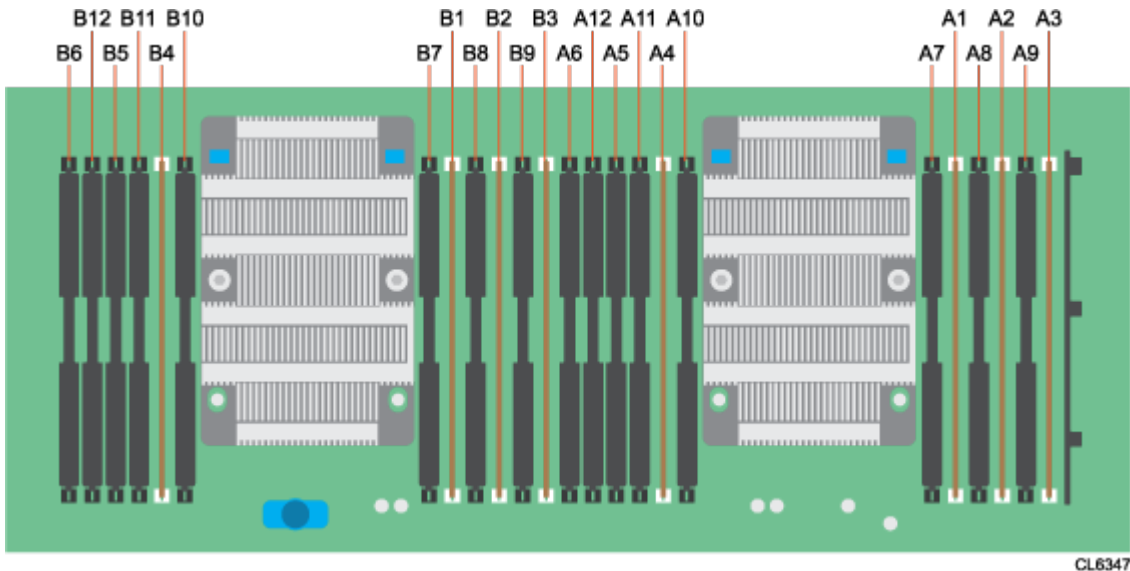
The following tables lists the memory channel mapping, and the DIMM configuration for each capacity point.

Table 6 DIMM memory channel mapping

Processor	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
1	A1 + A7	A2 + A8	A3 + A9	A4 + A10	A5 + A11	A6 + A12
2	B1 + B7	B2 + B8	B3 + B9	B4 + B10	B5 + B11	B6 + B12

Procedure

1. Access the IDPA web UI and check for alerts in the Health screen. Click an alert for more details.

2. Log in to the ACM command line by using SSH.

   Use `root` for the user, and use the common password for the appliance.

3. At the command line, type the following:

   ```
   # showfru dimm
   ```

   The screen displays that the system is collecting data. When the data collection is completed, the screen displays status information for the DIMMs.

```
acme-dp4400-ACM:~ # showfru dimm
Collecting Data............
```

```
| ID| Status| Manufacturer| Part#             | Serial# | Size    |
|================================================================|
| A1| OK     | Samsung       | M393A4K40BB2-CTD| 364BB912| 32768 MB|
| A2| ERROR  | Samsung       | M393A4K40BB2-CTD| 364B9A1B| 32768 MB| *
| A3| OK     | Samsung       | M393A4K40BB2-CTD| 364BA009| 32768 MB|
| A4| OK     | Samsung       | M393A4K40BB2-CTD| 36324964| 32768 MB|
| B1| OK     | Samsung       | M393A4K40BB2-CTD| 36324B7D| 32768 MB|
| B2| OK     | Samsung       | M393A4K40BB2-CTD| 3632553D| 32768 MB|
| B3| OK     | Samsung       | M393A4K40BB2-CTD| 36325451| 32768 MB|
| B4| OK     | Samsung       | M393A4K40BB2-CTD| 36324988| 32768 MB|
```

In this example, DIMM A2 is identified as failed and should be replaced.

Disconnect the power cords and I/O cables

This procedure is used to disconnect the system from electrical power and disconnect the peripherals.

Procedure

1. Shut down the system as described in Shut down the IDPA.

2. Label each power cord and I/O cable so you can easily identify them when you need to plug them in to restore the system.

3. Unplug power cords from the power supplies and disconnect the I/O cables from the system.

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 25 Remove System cover

Remove mid hard drive tray

Follow the following procedure to remove the middle hard drive tray.

Before you begin

⚠ **CAUTION** The hard drive tray is hot to touch for some time after the system has been powered down. Allow time for the hard drive tray to cool before handling it.

Procedure

1. Disconnect all the cables from the hard drive backplane.

2. Lift the hard drive tray handles 90 degrees upward.

3. Hold the hard drive tray handles, and lift the hard drive tray out of the system.

Figure 26 Removing mid hard drive tray
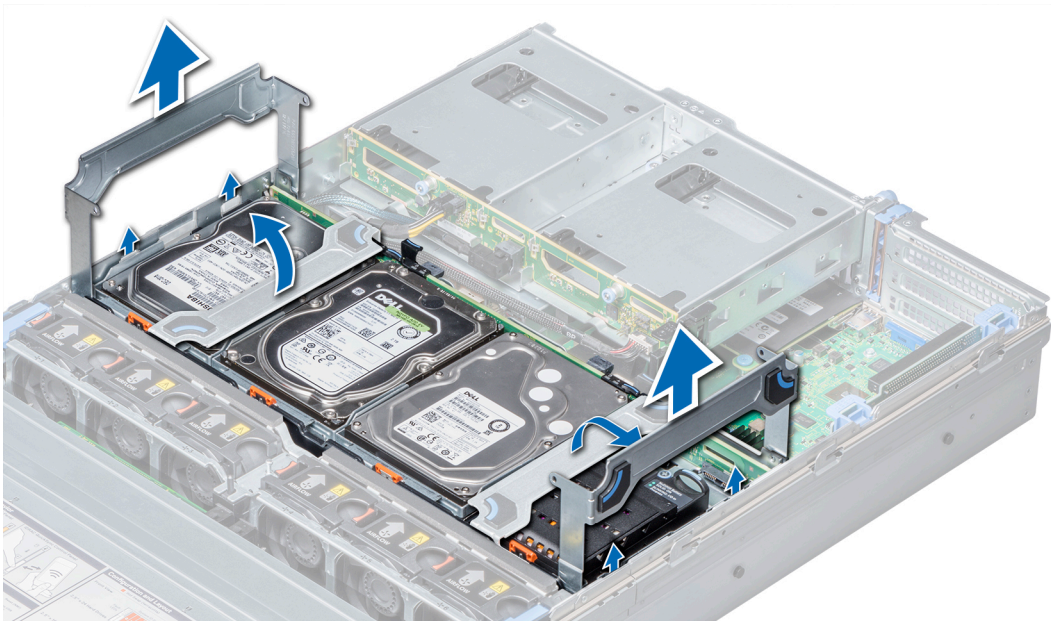
Remove the memory module

The procedure for removing a memory module and NVDIMM-N is identical.

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 27 Removing a memory module
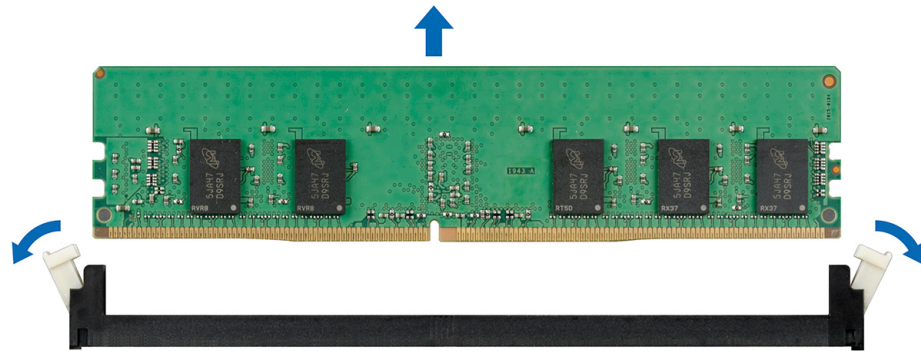
Install the memory module

The procedure for installing a memory module and NVDIMM-N is identical.

Before you begin

Follow all safety guidelines. Ensure that you where an ESD wrist strap when handling DIMMs and other internal components.

⚠ CAUTION Ensure that you install the NVDIMM-N battery if you are using NVDIMM-N.

⚠ CAUTION To prevent data loss and potential damage to your system, ensure that your system, LEDs on system, LEDs on NVDIMM-N and LEDs on NVDIMM-N battery are turned off before installing the NVDIMM-N battery.

⚠ 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 28 Installing a memory module
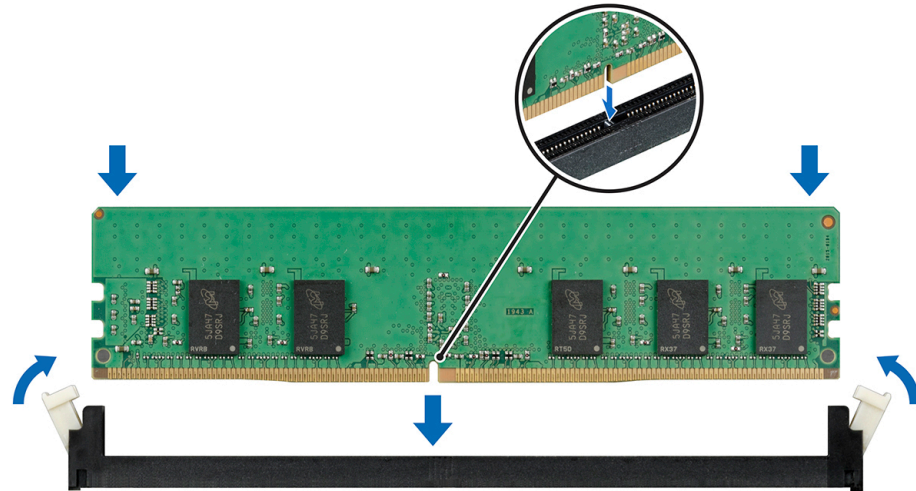
Install the mid hard drive tray

Perform the following steps to replace the mid hard drive tray.

Procedure

1. Lift the hard drive tray handles to 90 degrees upward.

2. Hold the hard drive tray handles, and align the slots on the hard drive tray with the guide pins on the system.

3. Lower the hard drive tray into the system.

4. Lower the hard drive tray handles to lock the hard drive tray in place.

5. Connect all the cables to the hard drive backplane.

Figure 29 Installing the mid hard drive tray
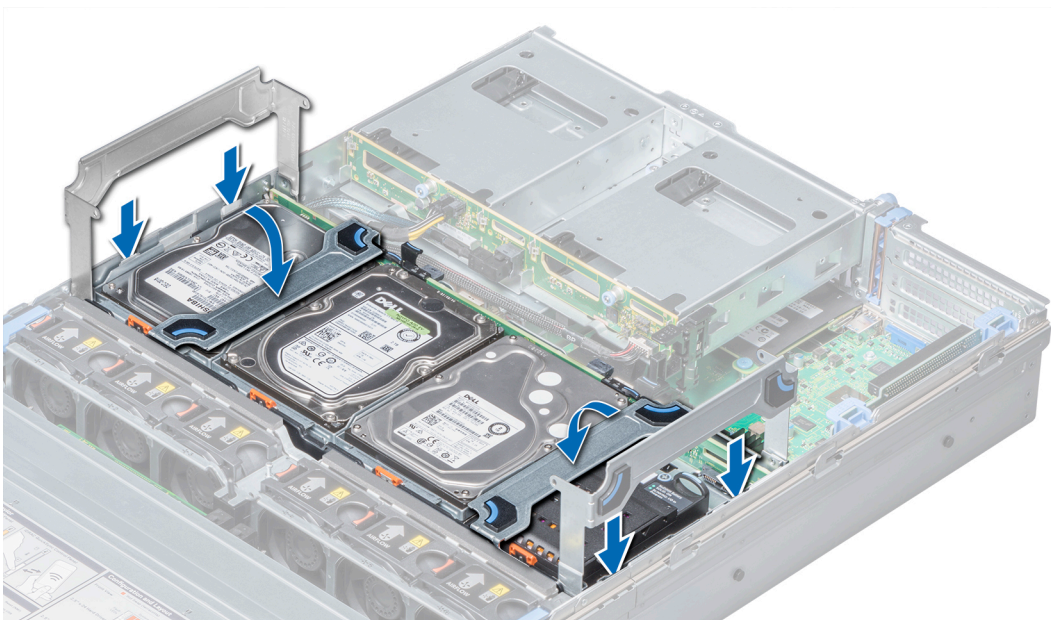
Install the system cover

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.

   Figure 30 Install the system cover

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 31 Slide the system into the cabinet
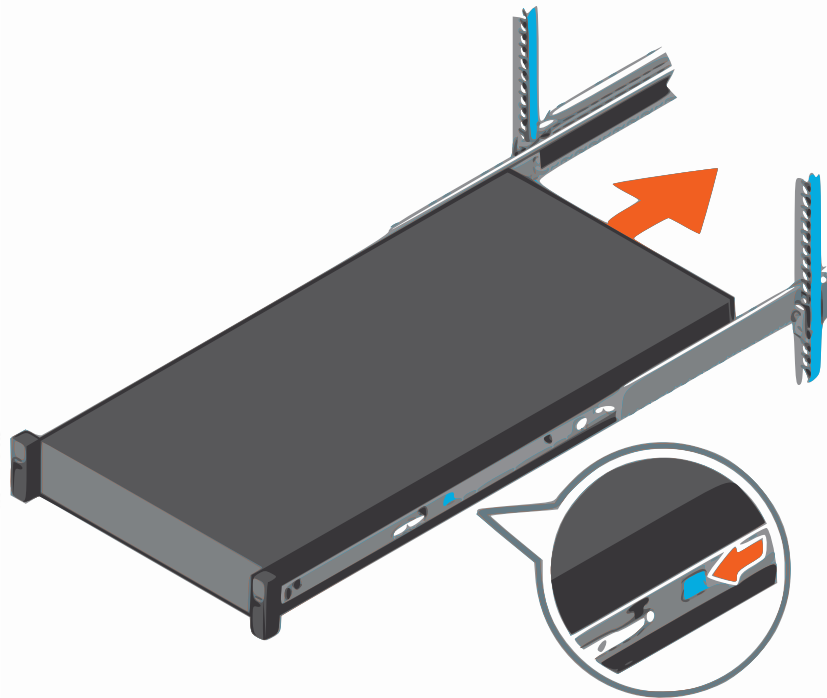
Connect the I/O cables and power cords

This procedure is used to connect the peripherals and power to the system.

Procedure

1. Using the connection information recorded on the labels, connect the I/O cables to the system.
2. Plug the power cords into the power supplies.

Verifying successful DIMM replacement from the ACM

After a DIMM is replaced and power has been re-applied, you can run the FRU command line verification from the ACM to ensure that the replacement was successful.

Procedure

1. From the ACM, type the following command: `# showfru dimm`

   The screen displays that the system is collecting data. When the data collection is completed, the screen displays status information for the DIMMs.

```
acme-dp4400-ACM:~ # showfru dimm
Collecting Data...........

_____
| ID| Status| Manufacturer| Part#            | Serial# | Size    |
|===========================================================|
| A1| OK     | Samsung      | M393A4K40BB2-CTD| 364BB912| 32768 MB|
| A2| OK     | Samsung      | M393A4K40BB2-CTD| 364B9A1B| 32768 MB| *
| A3| OK     | Samsung      | M393A4K40BB2-CTD| 364BA009| 32768 MB|
| A4| OK     | Samsung      | M393A4K40BB2-CTD| 36324964| 32768 MB|
| B1| OK     | Samsung      | M393A4K40BB2-CTD| 36324B7D| 32768 MB|
| B2| OK     | Samsung      | M393A4K40BB2-CTD| 3632553D| 32768 MB|
| B3| OK     | Samsung      | M393A4K40BB2-CTD| 36325451| 32768 MB|
| B4| OK     | Samsung      | M393A4K40BB2-CTD| 36324988| 32768 MB|
```

2. Verify that the status for all DIMMs is "OK".

M2 memory remove and replace

M2 memory is not hot-swappable and requires a system shutdown.

Identifying a failed M.2 from the ACM

If an M.2 is suspected of failing, you can check the web UI or use the FRU command line verification from the ACM.

Procedure

1. Access the web UI and check for alerts in the Health screen. Click an alert for more details.

2. Log in to the ACM command line by using SSH.

   Use `root` for the user, and use the common password for the appliance.

3. At the command line, type the following command: `# showfru boss`

   The screen displays that the system is collecting data. When the data collection is completed, the screen displays status information for the BOSS card and both M.2 cards.

```
Collecting Data............
_____
| ID      | State| Status| FW Version |
|===================================|
| BOSS-S1| 0     | OK    | 2.5.13.2008|

_____
| ID | State  | Status|  FW Version| Capacity| Operation| OpStatus|
|=============================================================|
| 0-0| Online| OK     |  N201DL43  | 111.79GB| None      | 0%       |
| 1-1|Offline| Error  |  N201DL43  | 111.79GB| None      | 0%       | *
```

In this example, M.2 1-1 is identified as failed and should be replaced.

Disconnect the power cords and I/O cables

This procedure is used to disconnect the system from electrical power and disconnect the peripherals.

Procedure

1. Shut down the system as described in Shut down the IDPA.

2. Label each power cord and I/O cable so you can easily identify them when you need to plug them in to restore the system.

3. Unplug power cords from the power supplies and disconnect the I/O cables from the system.

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 32 Remove System cover

Replace an M.2 module

The M.2 modules are installed on the BOSS card, which is installed on expansion card riser 1. The BOSS card is removed from the expansion card riser so that the M.2 modules can be accessed.

Remove BOSS card from expansion card riser 1

Procedure

1. Pull the expansion card latch out of the slot.
2. Hold the BOSS card by its edges, and pull the card until the card edge connector disengages from the expansion card connector on the riser.

   Figure 33 Removing the BOSS card from expansion card riser 1
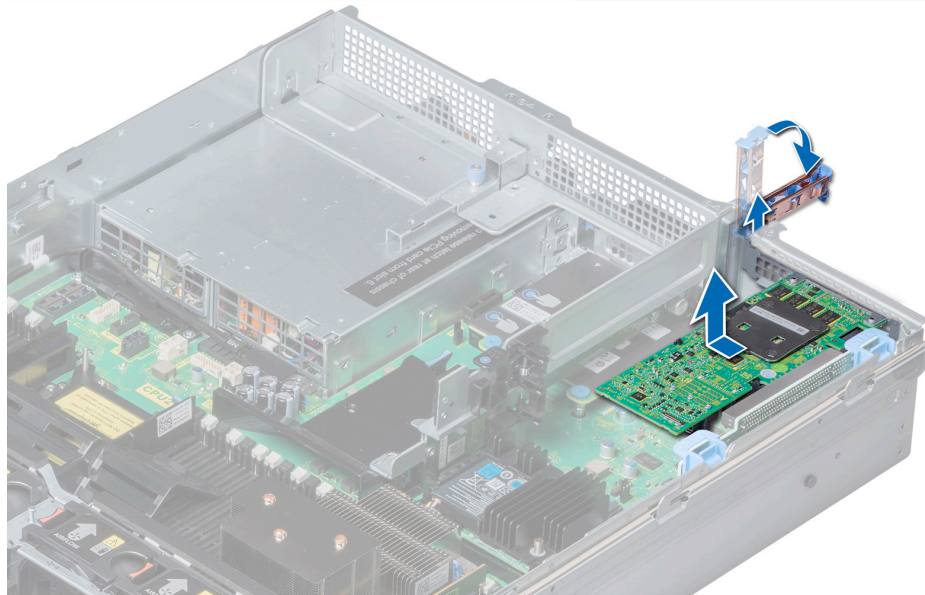
Remove M.2 module from the BOSS Card

Procedure

1. Identify the M.2 module to be replaced.

   The bottom M.2 module is in Slot 0, and the top M.2 module is in Slot 1.

2. Unscrew the screw that secures the M.2 module on the BOSS card.
3. Lift the M.2 module away from the BOSS card.

Figure 34 Removing the M.2 module
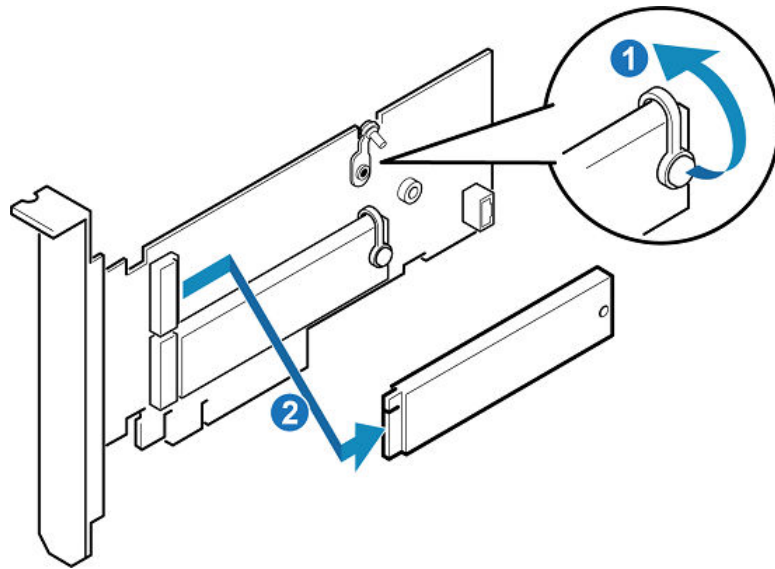
Install M.2 module on the BOSS Card

Procedure

1. Align the M.2 module connectors with the connectors on the BOSS card.

2. Tilt the M.2 module downwards until the module is seated firmly on the card.

3. Tighten the screw that secures the M.2 module on the BOSS card.

Figure 35 Installing the M.2 module
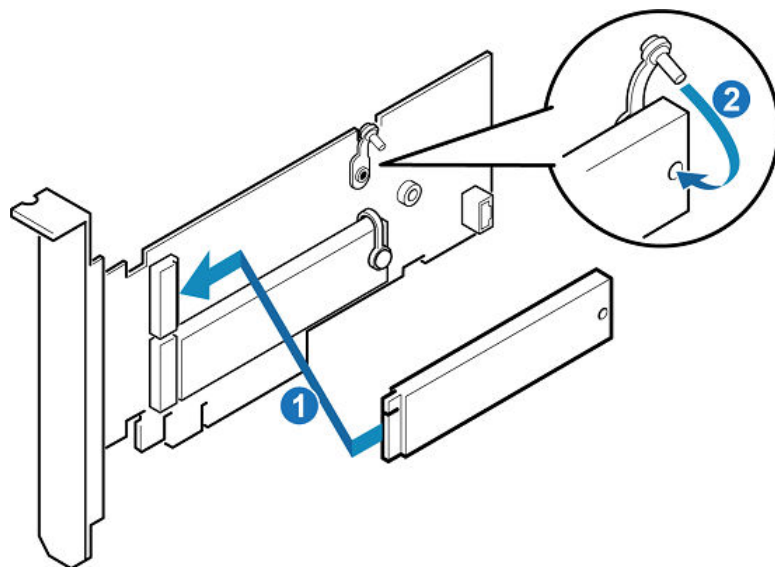
Install BOSS card onto expansion card riser 1

Procedure

1. Pull the expansion card latch out of the slot.

2. Hold the BOSS card by its edges, and align the card edge connector with the expansion card connector on the riser.

3. Insert the BOSS card edge connector firmly into expansion card slot 3 until the card is fully seated.

4. Push the expansion card latch into the slot.

Figure 36 Installing the BOSS card in expansion card riser 1
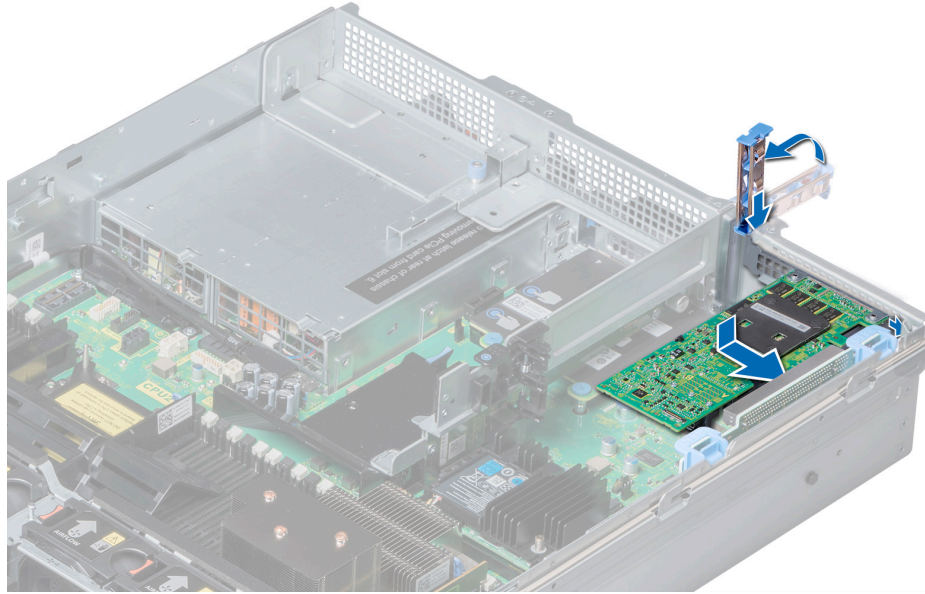
Install the system cover

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.

Figure 37 Install the system cover

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 38 Slide the system into the cabinet
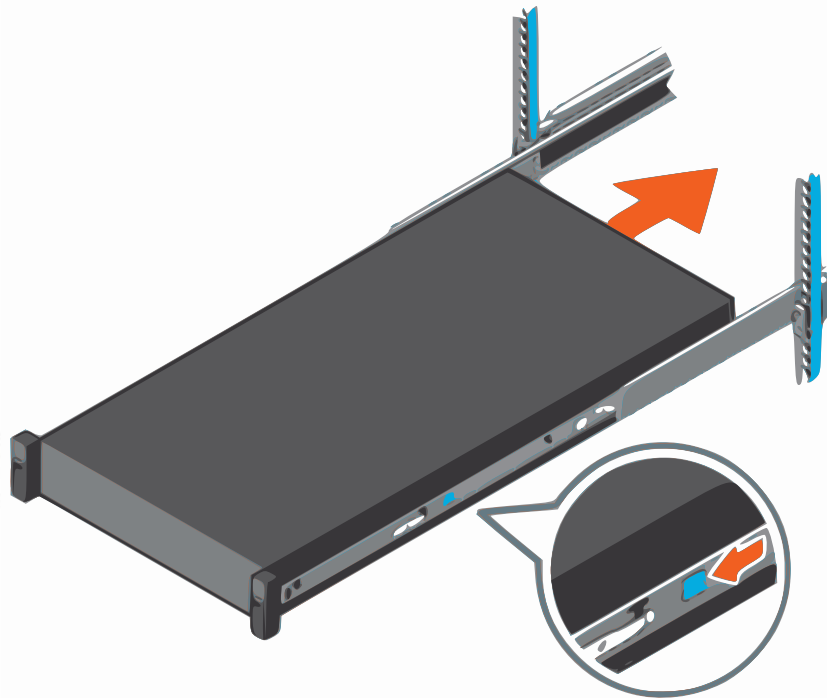
Connect the I/O cables and power cords

This procedure is used to connect the peripherals and power to the system.

Procedure

1. Using the connection information recorded on the labels, connect the I/O cables to the system.

2. Plug the power cords into the power supplies.

Verifying successful M.2 card replacement from the ACM

After an M.2 card is replaced and power has been re-applied, you can run the FRU command line verification from the ACM to ensure that the replacement was successful.

Procedure

1. From the ACM, type the following command: `# showfru boss`

   The screen displays that the system is collecting data. When the data collection is completed, the screen displays status information for the BOSS card and both M.2 cards.

```
acme-dp4400-ACM:~ # showfru boss
Collecting Data...........

_____
| ID     | State| Status| FW Version |
|===============================|
| BOSS-S1| 0    | OK    | 2.5.13.2008|

_____
| ID | State | Status| FW Version| Capacity| Operation| OpStatus|
|===========================================================|
| 0-0| Online| OK    | N201DL43  | 111.79GB| None     | 0%     |        |
| 1-1| Online| OK    | N201DL43  | 111.79GB| None     | 0%     | *
```

2. Verify that the status for the BOSS card is "OK". Verify that the state for both M.2 cards is "Online" and the statuses are "OK".

3. Verify that the RAID mirror is healthy:

    a. Log into iDRAC on the server.

    b. From the **Dashboard**, navigate to **Storage** > **Overview** > **Virtual Disks**.

    c. Use the Status, State, and Layout columns to verify that RAID is healthy and online.

Remove and replace the network daughter card

The network daughter card (NDC) is not hot-swappable and requires a system shutdown.

The NDC is a small, removable mezzanine card with integrated network interface controller (NIC) ports that provide network connectivity. The DP4400 supports up to four SFP+ ports that support up to 10 Gbps.

ⓘ **Note:** A mezzanine card is a printed circuit board that plugs directly into another plug-in card.

Replacing the NDC with an NDC of a different interface type

You can replace an NDC that has an optical interface with an NDC that has a copper interface, or vice versa. This procedure is the same as replacing an NDC that has failed. No additional steps are necessary because the network mapping persists in ESXi.

NIC indicator codes

Each NIC on the back panel has indicators that provide information about the activity and link status. The activity LED indicator indicates if data is flowing through the NIC, and the link LED indicator indicates the speed of the connected network.

Figure 39 NIC indicator codes
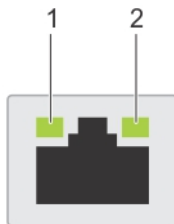
1. link LED indicator

2. activity LED indicator

Table 7 NIC indicator codes

Status	Condition
Link and activity indicators are off	The NIC is not connected to the network.
Link indicator is green and activity indicator is blinking green	The NIC is connected to a valid network at its maximum port speed and data is being sent or received.
Link indicator is amber and activity indicator is blinking green	The NIC is connected to a valid network at less than its maximum port speed and data is being sent or received.

Table 7 NIC indicator codes (continued)

Status	Condition
Link indicator is green and activity indicator is off	The NIC is connected to a valid network at its maximum port speed and data is not being sent or received.
Link indicator is amber and activity indicator is off	The NIC is connected to a valid network at less than its maximum port speed and data is not being sent or received.
Link indicator is blinking green and activity is off	NIC identify is enabled through the NIC configuration utility.

Identifying a failed NDC from the ACM

If the network daughter card (NDC) is suspected of failing, you can check the web UI or use the FRU command line verification from the ACM.

Procedure

1. Access the web UI and check for alerts in the Health screen. Click an alert for more details.

2. Log in to the ACM command line by using SSH.

   Use **root** for the user, and use the common password for the appliance.

3. At the command line, type the following command: # showfru network

   The screen displays that the system is collecting data. When the data collection is completed, the screen displays status information for the ports on the NIC.

```
acme-dp4400-ACM:~ # showfru network
Collecting Data............
_____
| Name            | Port| Link Status| Model Name                       |
|=======================================================================|
| NIC Integrated 1| 1   | Up         | Ethernet 10G 4P X710 SFP+ rNDC   |
| NIC Integrated 1| 2   | Error      | Ethernet 10G X710 rNDC           |
| NIC Integrated 1| 3   | Down       | Ethernet 10G X710 rNDC           |
| NIC Integrated 1| 4   | Down       | Ethernet 10G X710 rNDC           |
| NIC Slot 1      | 1   | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 2   | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 3   | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 4   | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 2      | 1   | Up         | Gigabit 2P I350-t Adapter        |
```

In this example, port 2 of Integrated NIC 1 is faulted, indicating it needs to be replaced.

Disconnect the power cords and I/O cables

This procedure is used to disconnect the system from electrical power and disconnect the peripherals.

Procedure

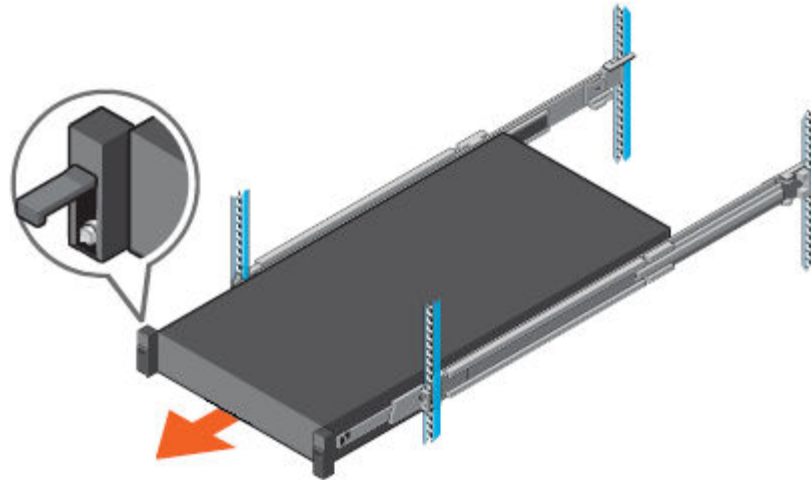1. Shut down the system as described in Shut down the IDPA.

2. Label each power cord and I/O cable so you can easily identify them when you need to plug them in to restore the system.

3. Unplug power cords from the power supplies and disconnect the I/O cables from the system.

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 40 Remove System cover

Remove the rear hard drive cage

The rear hard drive cage is removed to access the network daughter card.

Procedure

1. Disconnect all the cables from the rear hard drive backplane.
2. Using Phillips #2 screwdriver, loosen the screws that secure the hard drive cage to the system.
3. Ensure that the clip on the right-hand side of the cage is not holding anything in place.
4. Hold the hard drive cage by its sides, and lift it away from the system.

   Figure 41 Removing the 3.5 inch hard drive rear cage
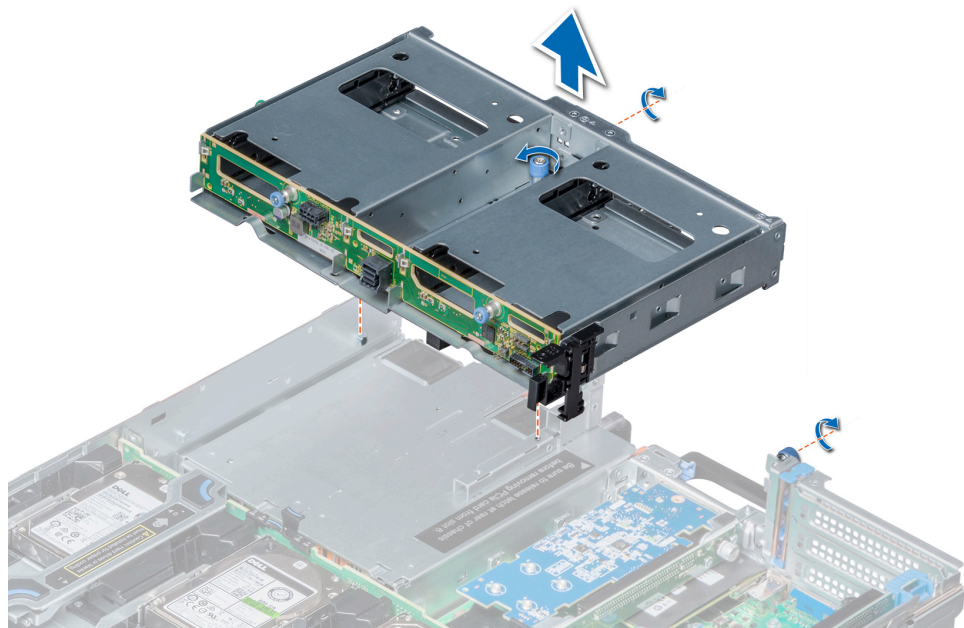
Remove the NVMe card and riser 2B

Procedure

1. Pull the NVMe card latch.
2. Hold the NVMe card by its edges, and pull the card until it disengages from the expansion card connector on the riser.

   Figure 42 Removing the NVMe card from expansion card riser 2B
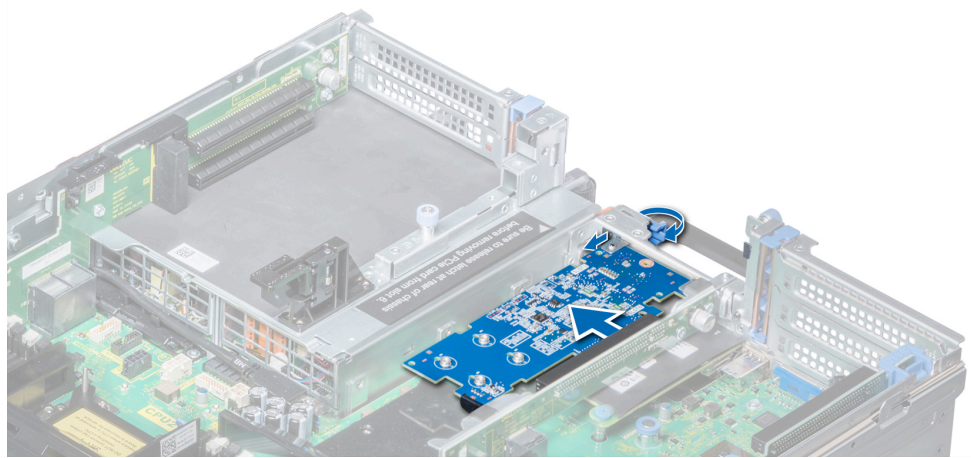
3. Remove expansion card riser 2B by holding the riser by its edges and lifting the riser from the connector on the system board.

   Figure 43 Removing expansion card riser 2B
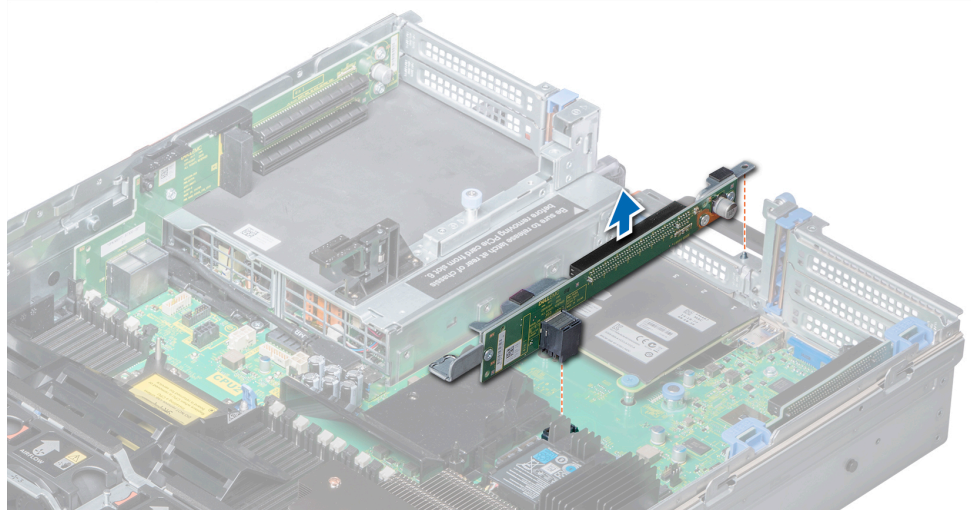
Remove the network daughter card

Procedure

1. Using a Phillips #2 screwdriver, loosen the captive screws that secure the 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 44 Removing the network daughter card
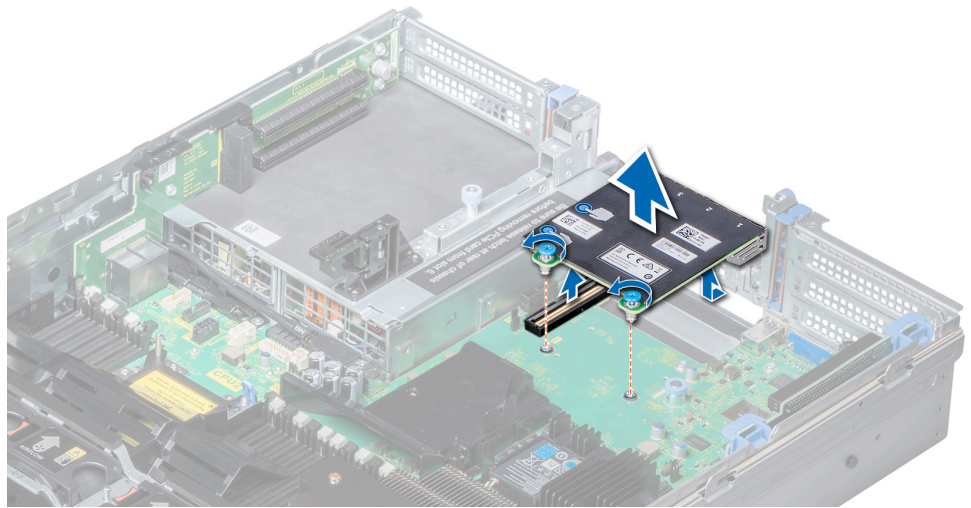
Install the network daughter card

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. You will hear a click when it is in place.

4. Using a Phillips #2 screwdriver, tighten the captive screws to secure the NDC to the system board.

   Figure 45 Installing the network daughter card
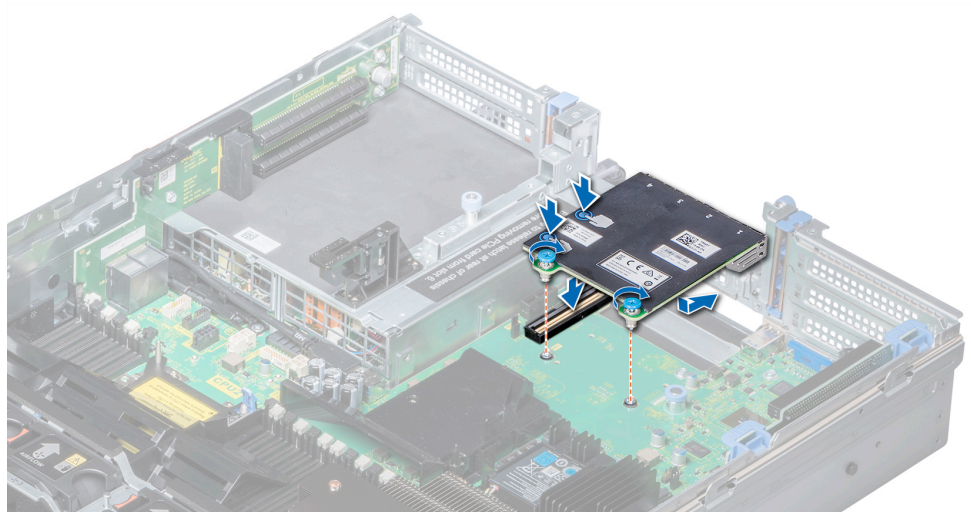
Install the NVMe card and riser 2B

Procedure

1. Align the slot on the riser with the standoff on the system.

2. Lower the riser into the system until the connector engages with the connector on the system board.

   Figure 46 Installing expansion card riser 2B
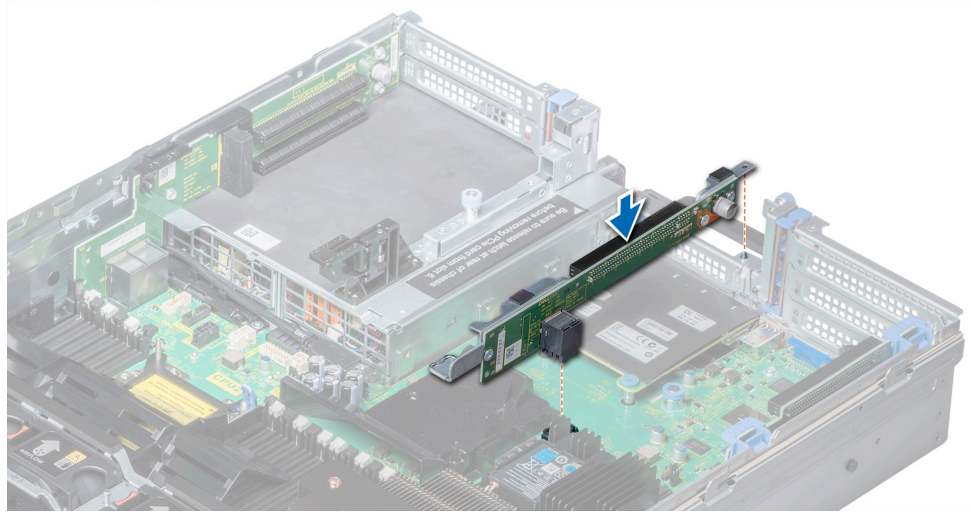
3. Pull the expansion card latch

4. Hold the card by its edges and align the card connector with the connector on the riser.

5. Insert the card firmly into the connector on the riser until the card is fully seated.

6. Push the expansion card latch.

   Figure 47 Installing the NVMe card into expansion card riser 2B
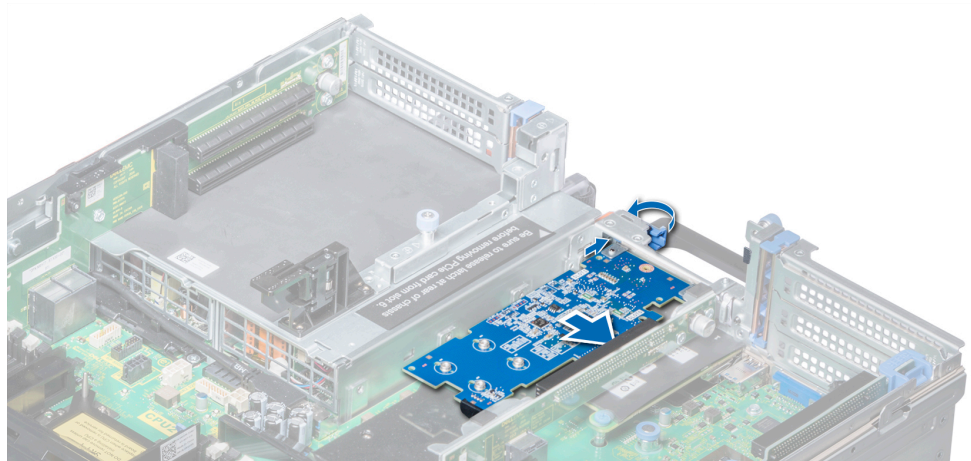
Install the rear hard drive cage

Procedure

1. Align the screws on the hard drive cage with the screw holes on the system.

2. Lower the hard drive cage into the system until it is firmly seated.

3. Using Phillips #2 screwdriver, tighten the screws to secure the hard drive cage to the system.

4. Connect all the cables to the rear hard drive backplane.

Figure 48 Installing the 3.5 inch rear hard drive cage
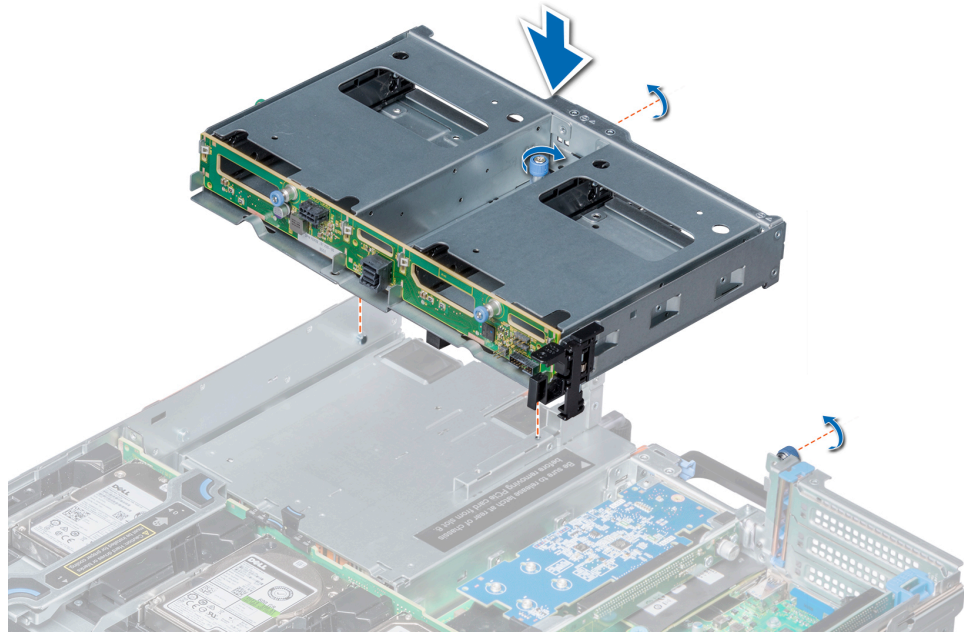
Install the system cover

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.

Figure 49 Install the system cover

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 50 Slide the system into the cabinet

Connect the I/O cables and power cords

This procedure is used to connect the peripherals and power to the system.

Procedure

1. Using the connection information recorded on the labels, connect the I/O cables to the system.
2. Plug the power cords into the power supplies.

Verifying successful NDC replacement from the ACM
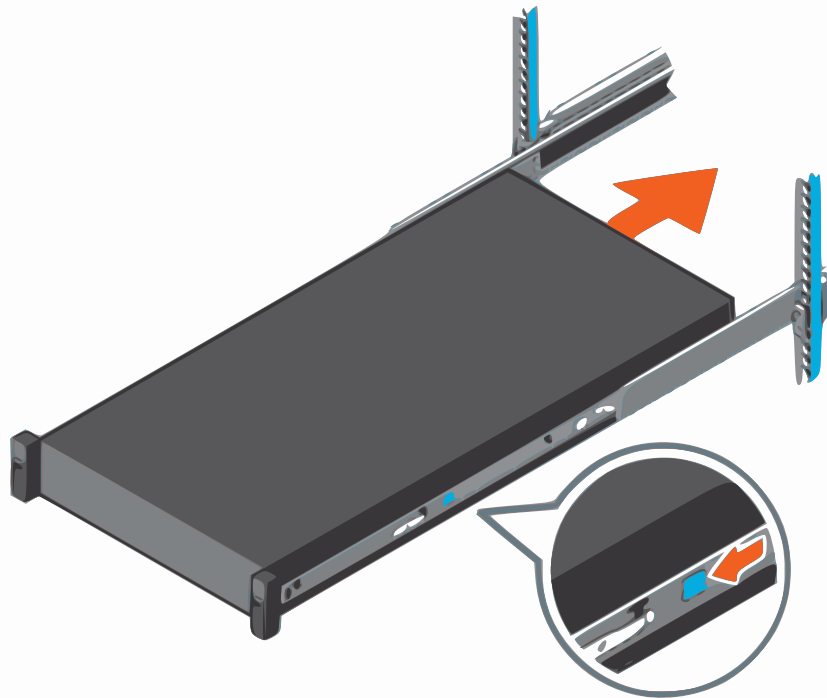
After the network daughter card (NDC) is replaced and power has been re-applied, you can run the FRU command line verification from the ACM to ensure that the replacement was successful.

Procedure

1. From the ACM, type the following command: `# showfru network`

   The screen displays that the system is collecting data. When the data collection is completed, the screen displays status information for ports the NIC.

```
acme-dp4400-ACM:~ # showfru network
Collecting Data............

_____
| Name             | Port| Link Status| Model Name                            |
|==============================================================================|
| NIC Integrated 1| 1   | Up         | Ethernet 10G 4P X710 SFP+ rNDC        |
| NIC Integrated 1| 2   | Up         | Ethernet 10G X710 rNDC                |
| NIC Integrated 1| 3   | Down       | Ethernet 10G X710 rNDC                |
| NIC Integrated 1| 4   | Down       | Ethernet 10G X710 rNDC                |
| NIC Slot 1      | 1   | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 2   | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 3   | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 4   | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 2      | 1   | Up         | Gigabit 2P I350-t Adapter             |
| NIC Slot 2      | 2   | Down       | Gigabit 2P I350-t Adapter             |
```

2. Verify that the status information for the NDC matches the information shown in the example output.

Remove and replace NIC cards

NIC cards are not hot-swappable and require a system shutdown.

The network interface controller (NIC) cards are removable PCI cards. The DP4400 ships with one 10 GbE quad-port optical ethernet card used for the LAN, and one 1 GbE dual-port copper ethernet card used for a service connection. The removal and install processes are the same for both cards.

Replacing the quad-port NIC card with a NIC card of a different interface type

You can replace a quad-port network interface controller (NIC) card that has an optical interface with a card that has a copper interface, or vice versa. This procedure is the same as replacing a card that has failed. No additional steps are necessary because the network mapping persists in ESXi.

NIC indicator codes

Each NIC on the back panel has indicators that provide information about the activity and link status. The activity LED indicator indicates if data is flowing through the NIC, and the link LED indicator indicates the speed of the connected network.

Figure 51 NIC indicator codes
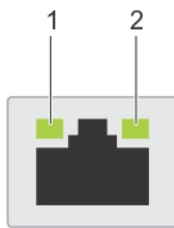
1. link LED indicator

2. activity LED indicator

Table 8 NIC indicator codes

Status	Condition
Link and activity indicators are off	The NIC is not connected to the network.
Link indicator is green and activity indicator is blinking green	The NIC is connected to a valid network at its maximum port speed and data is being sent or received.
Link indicator is amber and activity indicator is blinking green	The NIC is connected to a valid network at less than its maximum port speed and data is being sent or received.
Link indicator is green and activity indicator is off	The NIC is connected to a valid network at its maximum port speed and data is not being sent or received.

Table 8 NIC indicator codes (continued)

Status	Condition
Link indicator is amber and activity indicator is off	The NIC is connected to a valid network at less than its maximum port speed and data is not being sent or received.
Link indicator is blinking green and activity is off	NIC identify is enabled through the NIC configuration utility.

Identifying a failed NIC from the ACM

If the NIC is suspected of failing, you can check the web UI or use the FRU command line verification from the ACM.

Procedure

1. Access the web UI and check for alerts in the Health screen. Click an alert for more details.

2. Log in to the ACM command line by using SSH.

   Use `root` for the user, and use the common password for the appliance.

3. At the command line, type the following command: `# showfru network`

   The screen displays that the system is collecting data. When the data collection is completed, the screen displays status information for the ports on the NIC.

```
acme-dp4400-ACM:~ # showfru network
Collecting Data............
_____
| Name             | Port| Link Status| Model Name                     |
|======================================================================|
| NIC Integrated 1| 1    | Up          | Ethernet 10G 4P X710 SFP+ rNDC  |
| NIC Integrated 1| 2    | Up          | Ethernet 10G X710 rNDC          |
| NIC Integrated 1| 3    | Down        | Ethernet 10G X710 rNDC          |
| NIC Integrated 1| 4    | Down        | Ethernet 10G X710 rNDC          |
| NIC Slot 1      | 1    | Down        | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 2    | Down        | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 3    | Up          | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 4    | Error       | Ethernet Converged Network Adapter X710|
| NIC Slot 2      | 1    | Up          | Gigabit 2P I350-t Adapter       |
```

In this example, port 4 of NIC 1 is faulted, indicating it needs to be replaced.

Disconnect the power cords and I/O cables

This procedure is used to disconnect the system from electrical power and disconnect the peripherals.

Procedure

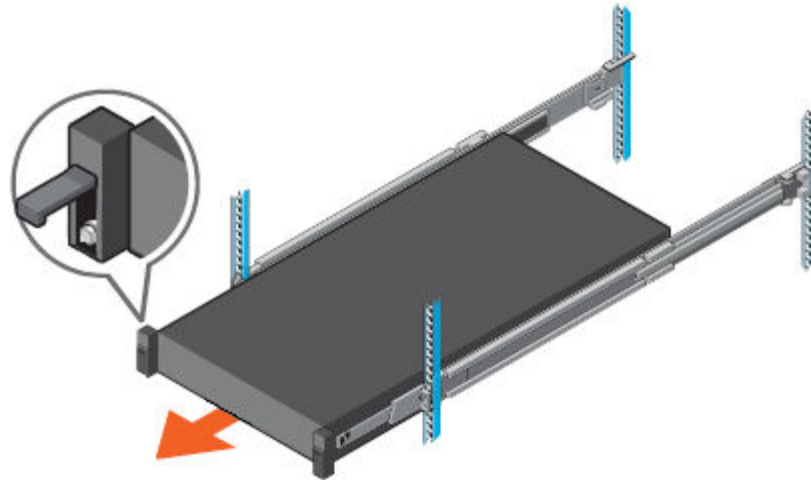1. Shut down the system as described in Shut down the IDPA.

2. Label each power cord and I/O cable so you can easily identify them when you need to plug them in to restore the system.

3. Unplug power cords from the power supplies and disconnect the I/O cables from the system.

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 52 Remove System cover

Remove the NIC card from expansion card riser 1

Procedure

1. Pull the expansion card latch from the slot.

2. Remove the card from the expansion card connector.

Figure 53 Removing the NIC card from expansion card riser 1
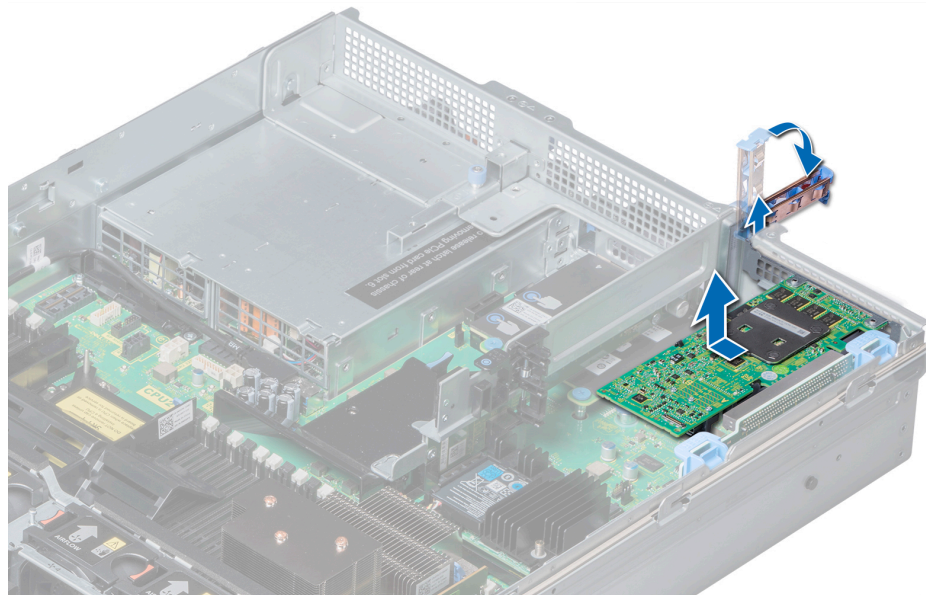
Install the NIC card into expansion card riser 1

Before you begin

Follow all safety guidelines.

Procedure

1. Unpack the NIC card and prepare it for installation.

(i) **Note:** For instructions, see the documentation accompanying the card.

2. Pull the expansion card latch.

3. If installed, remove the filler bracket.

(i) **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.

4. Hold the NIC card by its edges, and align the card edge connector with the expansion card connector on the riser.

5. Insert the card edge connector firmly into the expansion card connector until the card is fully seated.

6. Push the expansion card latch into the slot.

Figure 54 Installing the NIC card in expansion card riser 1
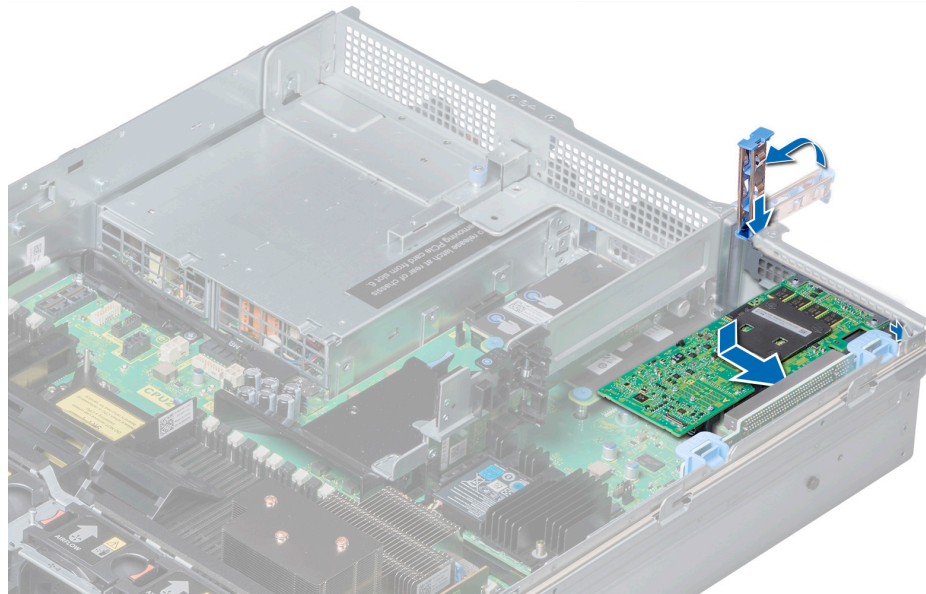
Install the system cover

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.

Figure 55 Install the system cover

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
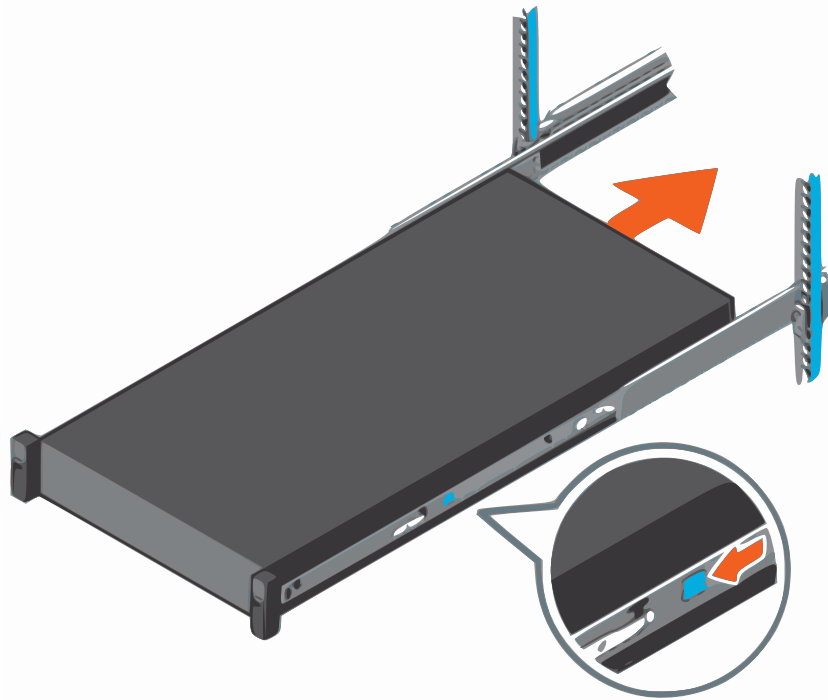
Connect the I/O cables and power cords

This procedure is used to connect the peripherals and power to the system.

Procedure

1. Using the connection information recorded on the labels, connect the I/O cables to the system.
2. Plug the power cords into the power supplies.

Verifying successful NIC replacement from the ACM

After the NIC is replaced and power has been re-applied, you can run the FRU command line verification from the ACM to ensure that the replacement was successful.

Procedure

1. From the ACM, type the following command: `# showfru network`

   The screen displays that the system is collecting data. When the data collection is completed, the screen displays status information for ports the NIC.

```
acme-dp4400-ACM:~ # showfru network
Collecting Data............

_____
| Name             | Port| Link Status| Model Name                      |
|========================================================================|
| NIC Integrated 1| 1    | Up         | Ethernet 10G 4P X710 SFP+ rNDC   |
| NIC Integrated 1| 2    | Up         | Ethernet 10G X710 rNDC           |
| NIC Integrated 1| 3    | Down       | Ethernet 10G X710 rNDC           |
| NIC Integrated 1| 4    | Down       | Ethernet 10G X710 rNDC           |
| NIC Slot 1      | 1    | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 2    | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 3    | Down       | Ethernet Converged Network Adapter X710|
| NIC Slot 1      | 4    | Up         | Ethernet Converged Network Adapter X710|
| NIC Slot 2      | 1    | Up         | Gigabit 2P I350-t Adapter        |
```

2. Verify that the status information for the NIC matches the information shown in the example output.

Remove and replace the NVMe card

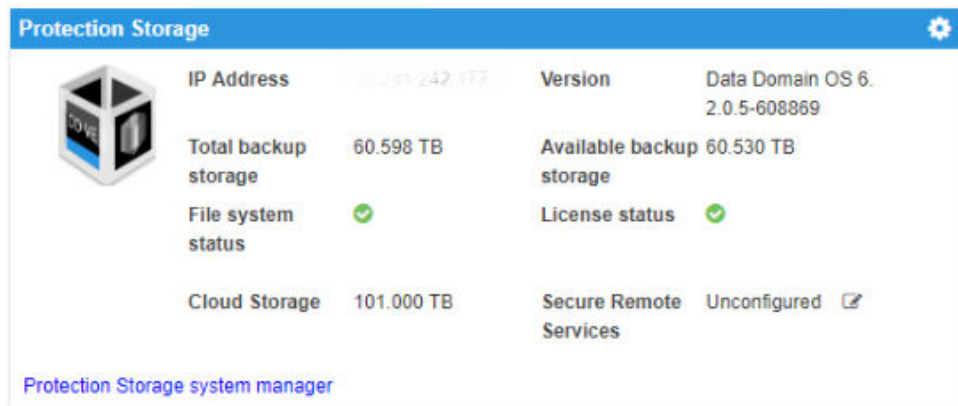The NVMe card is not hot-swappable and requires a system shutdown.

The NVMe card in PCIe slot 4 is used as the SSD cache tier for the Data Domain Virtual Edition (DDVE) VM. When you replace the NVMe card, you must reconfigure the DDVE cache tier.

Record existing SSD cache tier details

You will need the size and device number of the cache tier when you create the new data store after replacing the NVMe card.

Procedure

1. Log in to the ACM GUI dashboard and determine the IP address for the DDVE VM.

2. Using SSH, log in to the DDVE VM as sysadmin using the common password for the appliance.

3. To view the cache tier details, type the following command: `# storage show tier cache`

```
sysadmin@ssg242172# storage show tier cache
Cache tier details:
Device    Device   Device
Group              Size
------    ------   ---------
dg1       3        960.0 GiB
------    ------   ---------

Spindle   Devices   Count   Total Size
Group
-------   -------   -----   ----------
1         3         1       960.0 GiB
-------   -------   -----   ----------

Current cache tier size: 0.9 TiB

Storage addable devices:
Device        Device   Device
Type                   Size
---------     ------   -------
(unknown)     14       4.1 TiB
(unknown)     15       4.1 TiB
(unknown)     16       4.1 TiB
(unknown)     17       4.1 TiB
(unknown)     26       4.1 TiB
```

```
(unknown)    27      4.1 TiB
(unknown)    28      4.1 TiB
(unknown)    29      4.1 TiB
(unknown)    30      4.1 TiB
---------    ------  -------

Capacity License:
License    Total       Used        Remaining
--------   ---------   ---------   ---------
CAPACITY   54.56 TiB   54.56 TiB   0.00 TiB
--------   ---------   ---------   ---------
```

In this example, the size of the cache tier is 960 GB and it is located on device 3.

4. Record the disk size and device number.

Remove the cache tier and delete the datastore

Procedure

1. To remove the cache tier, type the following command: `# storage remove dev<number>`

    ```
    sysadmin@ssg242172# storage remove dev3

    Removing dev3...done

    Updating system information...done

    dev3 successfully removed.
    ```

2. Log in to the ESXi server.

3. Identify the disk for the DDVE cache tier:

    a. Under **Virtual Machines**, select the DDVE VM.

    b. Under **Hardware Configuration**, identify the disk for the cache tier.

▼ 🖳 Hard disk 30	
Backing	[DP-appliance-ssd] DDVE/DDVE_29.vmdk
Capacity	960 GB
Thin provisioned	No
Controller	SCSI controller 0:3
Mode	Independent persistent

4. From the top menu bar, click **Edit**.

5. Click the disk that you identified in step 3.

6. Click the **Delete files from datastore** checkbox.

7. Click the **X** at the right of the **Hard disk** column to delete the disk from the configuration.

8. Click **Save**.

9. From the ESXi Navigator, click **Storage**, and then click **DP-appliance-ssd**.

10. Click **Actions** > **Delete**.

Disconnect the power cords and I/O cables

This procedure is used to disconnect the system from electrical power and disconnect the peripherals.

Procedure

1. Shut down the system as described in Shut down the IDPA.

2. Label each power cord and I/O cable so you can easily identify them when you need to plug them in to restore the system.
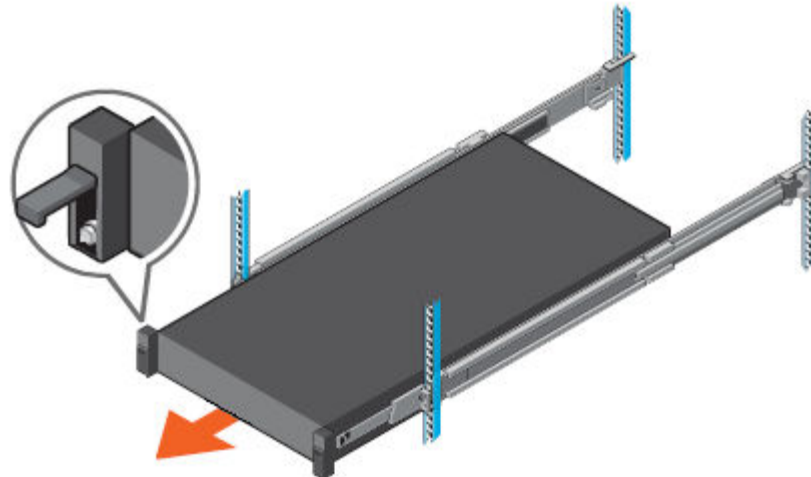
3. Unplug power cords from the power supplies and disconnect the I/O cables from the system.

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

Remove the rear hard drive cage

The rear hard drive cage is removed to access the network daughter card.

Procedure

1. Disconnect all the cables from the rear hard drive backplane.
2. Using Phillips #2 screwdriver, loosen the screws that secure the hard drive cage to the system.
3. Ensure that the clip on the right-hand side of the cage is not holding anything in place.
4. Hold the hard drive cage by its sides, and lift it away from the system.

   Figure 58 Removing the 3.5 inch hard drive rear cage
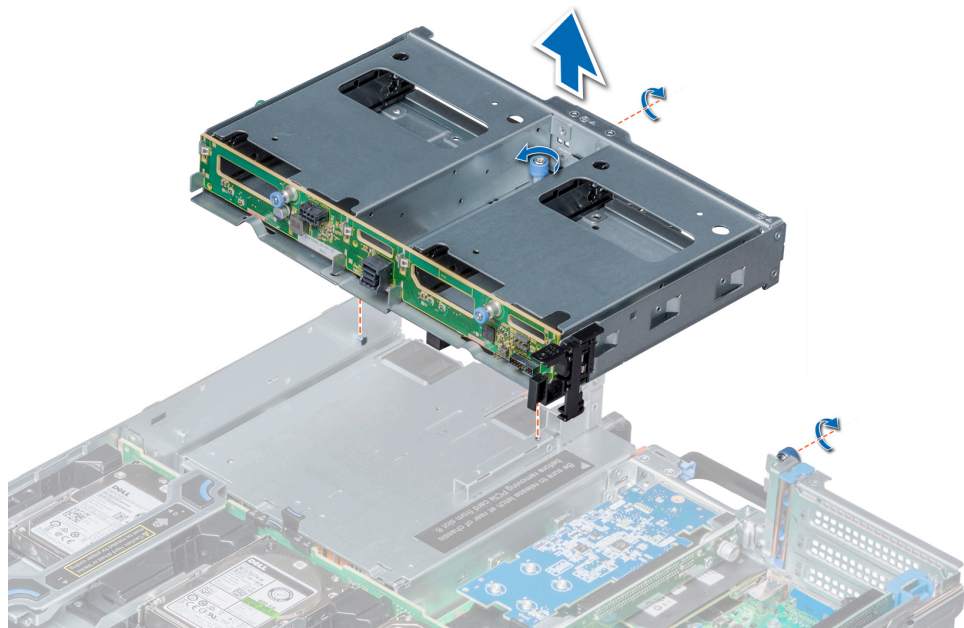
Remove the NVMe card

Procedure

1. Pull the NVMe card latch.
2. Hold the NVMe card by its edges, and pull the card until it disengages from the expansion card connector on the riser.

Figure 59 Removing the NVMe card from expansion card riser 2B
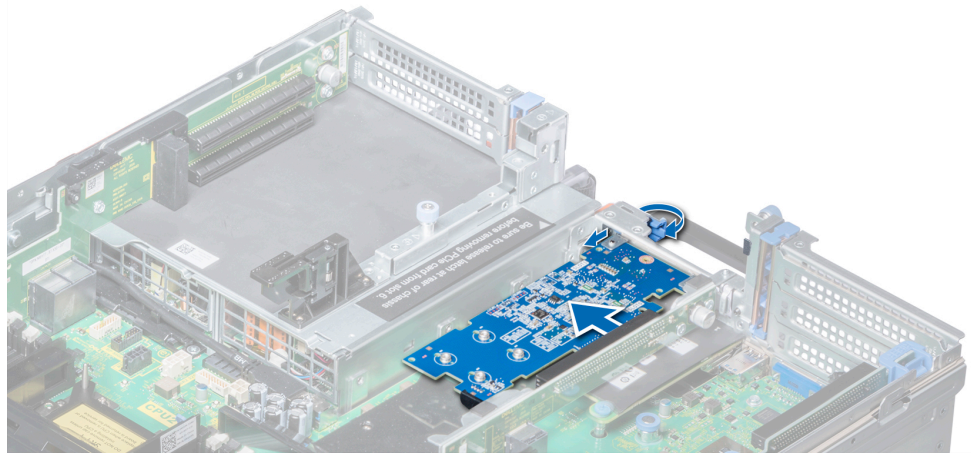
Install the NVMe card

Procedure

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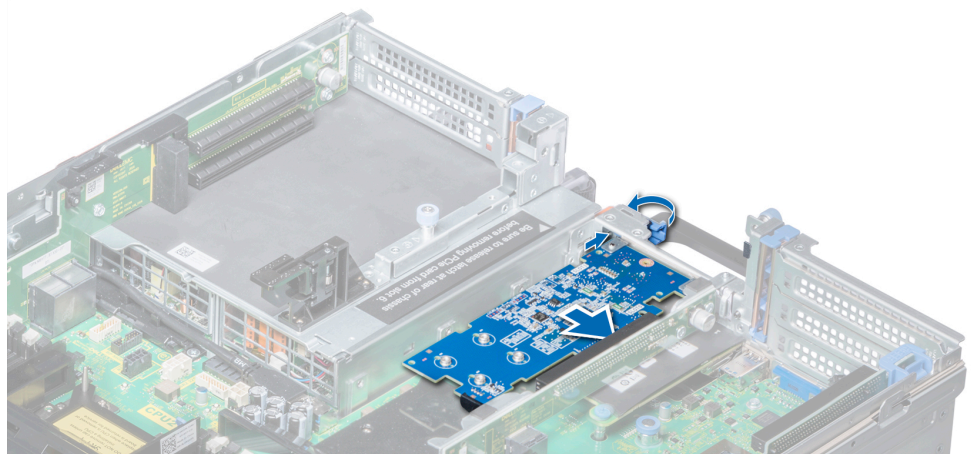3. Insert the card firmly into the connector on the riser until the card is fully seated.
4. Push the expansion card latch.

Figure 60 Installing the NVMe card into expansion card riser 2B

Install the rear hard drive cage

Procedure

1. Align the screws on the hard drive cage with the screw holes on the system.
2. Lower the hard drive cage into the system until it is firmly seated.
3. Using Phillips #2 screwdriver, tighten the screws to secure the hard drive cage to the system.
4. Connect all the cables to the rear hard drive backplane.

Figure 61 Installing the 3.5 inch rear hard drive cage
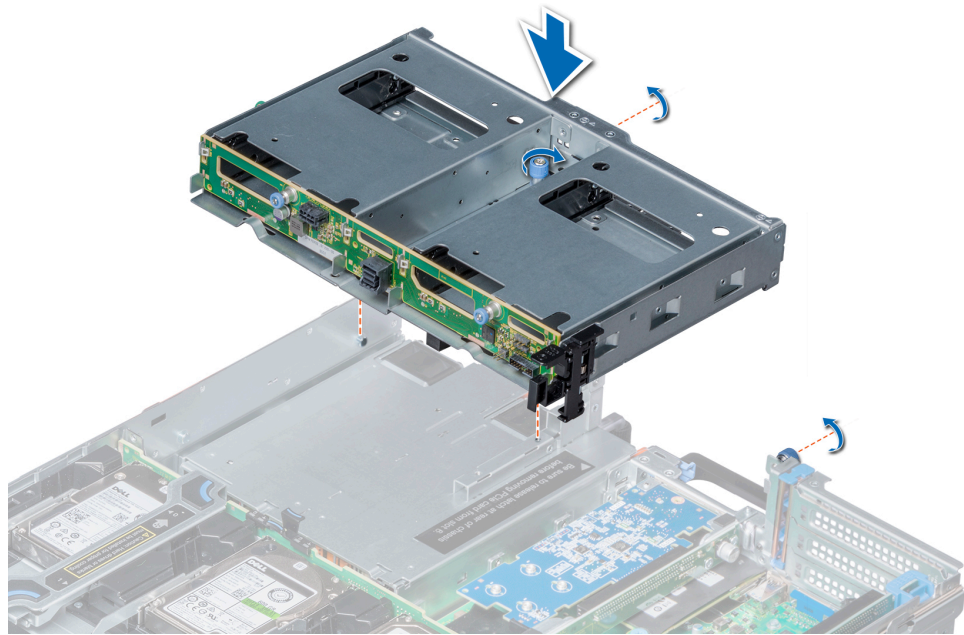
Install the system cover

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.

Figure 62 Install the system cover

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 63 Slide the system into the cabinet
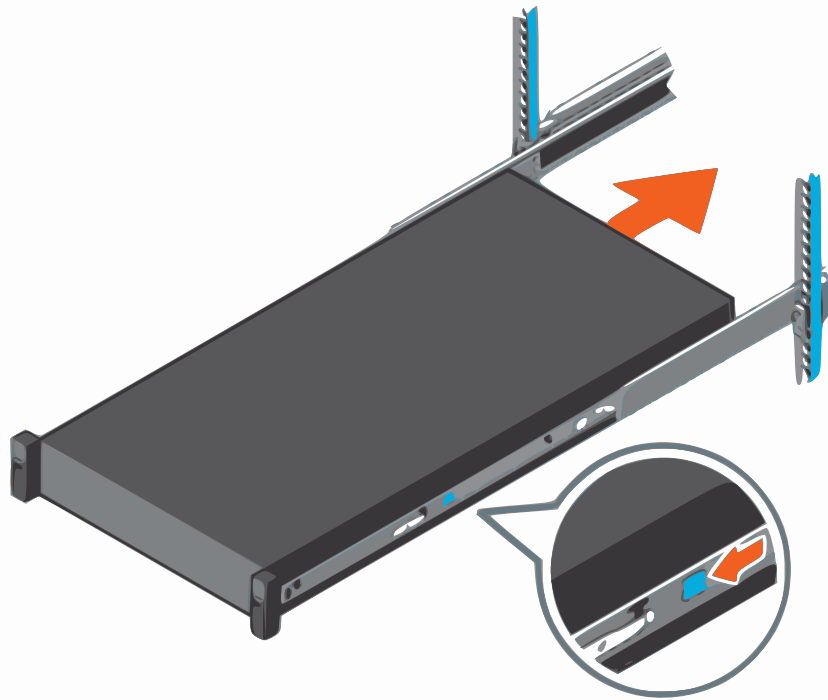
Connect the I/O cables and power cords

This procedure is used to connect the peripherals and power to the system.

Procedure

1. Using the connection information recorded on the labels, connect the I/O cables to the system.

2. Plug the power cords into the power supplies.

Create a new datastore

Procedure

1. Log in to the ESXi server

2. Create a new data store named DP-appliance-ssd:

   a. From the ESXi Navigator, click **Storage**.

   b. Click **New datastore**.

   c. Complete the steps in the **New Datastore** wizard.
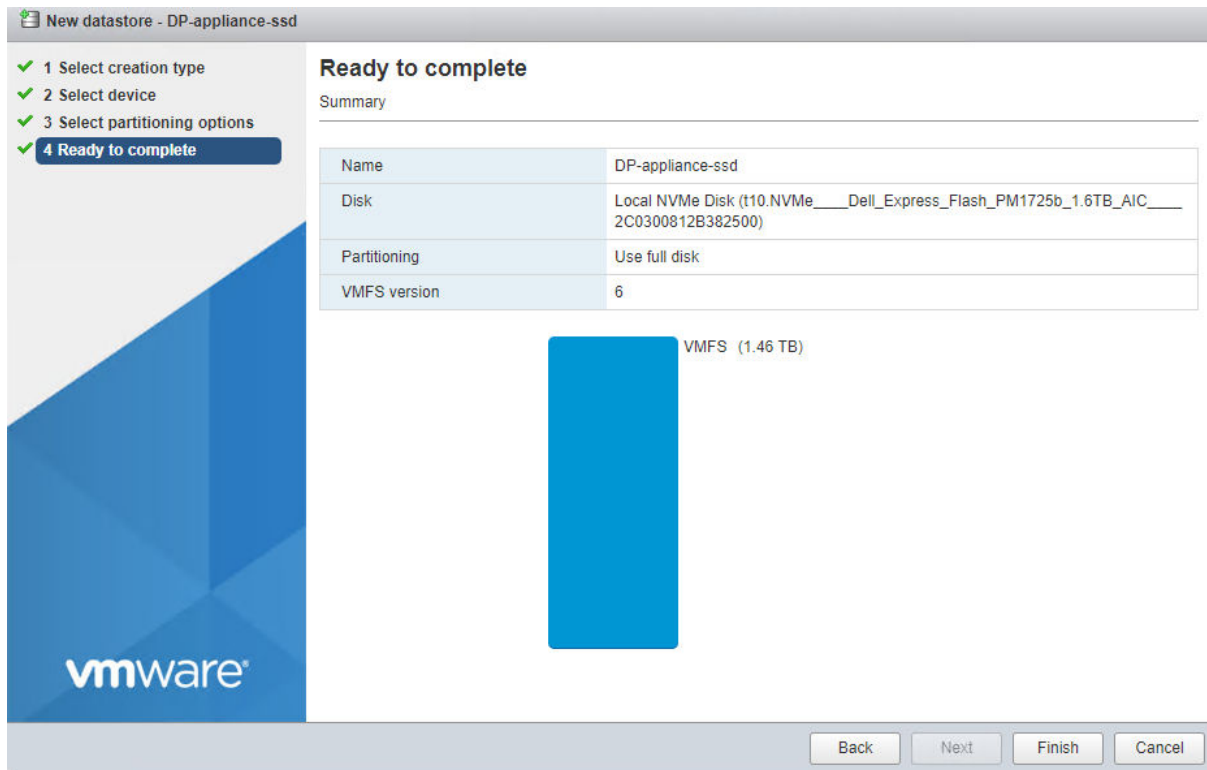
Add the cache tier to the DDVE VM

Procedure

1. Log in to the ESXi server.

2. Add a hard disk to the DDVE VM using the newly created SSD datastore named DP-appliance-ssd.

   a. Under **Virtual Machines**, select the DDVE VM.

   b. Click **Edit**.

   c. Click **Add hard disk**, and select **New hard disk**.

   d. For the disk size, enter the size that you recorded previously.

   e. For the location, choose **DP-appliance-ssd**.

   f. For **Disk Provisioning**, click **Thick provisioned, lazily zeroed**.

   g. For **Disk mode**, select **Independent - persistent**.

▾ 💾 New Hard disk ⚠	960	GB ▾
Maximum Size	1.45 TB	
Location	[DP-appliance-ssd] /	Browse...
Disk Provisioning	○ Thin provisioned ◉ Thick provisioned, lazily zeroed ○ Thick provisioned, eagerly zeroed	
Shares	Normal ▾	1000 ▾
Limit - IOPs	Unlimited ▾	
Virtual Device Node	SCSI controller 0 ▾	SCSI (0:2) ▾
Disk mode	Independent - persistent ▾	
Sharing	None ▾	
	ⓘ Disk sharing is only possible with eagerly zeroed, thick provisioned disks.	

3. Log in to the DDVE VM as sysadmin.

4. To determine the device number for the new SSD hard disk, type the following command: `# disk show hardware`

```
sysadmin@ssg242172# disk show hardware
Disk    Slot       Manufacturer/Model       Firmware   Capacity   Type
        (pci/idx)
-----   ---------  -----------------------  --------   ---------  ------
dev1    160:0      VMware  Virtual_disk     n/a        250.0 GiB  SAS
dev2    160:1      VMware  Virtual_disk     n/a        10.0 GiB   SAS
.....
dev28   224:11     VMware  Virtual_disk     n/a        4.1 TiB    SAS
dev29   224:12     VMware  Virtual_disk     n/a        4.1 TiB    SAS
dev30   224:13     VMware  Virtual_disk     n/a        4.1 TiB    SAS
dev31   160:2      VMware  Virtual_disk     n/a        960.0 GiB  SAS-SSD
-----   ---------  -----------------------  --------   ---------  -------
30 drives present.
--------    ---------   ---------   ---------
```

In this example, the new SSD hard disk is device 31.

5. To verify that the disk is not being used, type the following command: `# disk show state`

```
sysadmin@ssg242172# disk show state
Dev     1  2  3  4  5  6  7  8  9  10
-----   ------------------------------
1-10    Y  Y  -  .  .  .  .  .  .  .
11-20   .  .  .  U  U  U  U  .  .  .
21-30   .  .  .  .  .  U  U  U  U  U
31-31   U
-----   ------------------------------

Legend   State                Count
------   -------------------  -----
-        Not Installed Disks  1
.        In Use Device        18
U        Unknown Device       10
Y        System Device        2
------   -------------------  -----
Total 0 disks and 31 devs
```

6. To add the cache tier back to the DDVE VM, type the following command: `# storage add tier cache dev<number> spindle-group 1`

```
sysadmin@ssg242172# storage add tier cache dev31 spindle-group 1

Checking storage requirements...done
Adding dev31 to the cache tier...done

Updating system information...done

dev31 successfully added to the cache tier.
```

7. To verify that the cache tier was added successfully, type the following command: `#
storage show tier cache`

```
sysadmin@ssg242172# storage show tier cache
Cache tier details:
Device    Device    Device
Group               Size
------    ------    ---------
dg4       31        960.0 GiB
------    ------    ---------

Spindle   Devices   Count   Total Size
Group
-------   -------   -----   ----------
1         31        1       960.0 GiB
-------   -------   -----   ----------

Current cache tier size: 0.9 TiB

Storage addable devices:
Device       Device   Device
Type                  Size
---------    ------   -------
(unknown)    14       4.1 TiB
(unknown)    15       4.1 TiB
(unknown)    16       4.1 TiB
(unknown)    17       4.1 TiB
(unknown)    26       4.1 TiB
(unknown)    27       4.1 TiB
(unknown)    28       4.1 TiB
(unknown)    29       4.1 TiB
(unknown)    30       4.1 TiB
---------    ------   -------

Capacity License:
License    Total        Used         Remaining
--------   ---------    ---------    ---------
CAPACITY   54.56 TiB    54.56 TiB    0.00 TiB
--------   ---------    ---------    ---------
```

8. To verify that the filesystem is enabled and running, type the following command: `filesys
status`

```
sysadmin@ssg242172# filesys status
The filesystem is enabled and running.
```

Results

The NVMe replacement is complete.

Start up the IDPA

You can start the IDPA from the Dell server through iDRAC.

Start up the IDPA from Dell server

About this task

Switch on the power button on the Dell server.

Start up the IDPA from iDRAC

Procedure

1. Turn on the iDRAC and log in to iDRAC from its UI using `root` user and iDRAC password.

2. Click the **Power On System** button.

   (i) Note: The ACM will be accessible within approximately 20 minutes.

3. Connect to the ACM by accessing the *https://<ACM_IP>:8543* URL from the browser.

Remove and replace assemblies

Document references for IDPA

The IDPA documentation set includes the following publications:

- *Integrated Data Protection Appliance DP4400 Installation Guide*
  Instruction for installing the IDPA DP4400 hardware.

- *Integrated Data Protection Appliance Getting Started Guide*
  Explains how to perform initial IDPA configuration tasks and how to get started with basic functionality like backup and restore.

- *Integrated Data Protection Appliance Product Guide*
  Provides the overview and administration information about the IDPA system.

- *Integrated Data Protection Appliance Release Notes*
  Product information about the current IDPA release.

- *Integrated Data Protection Appliance DP4400 Service Procedure Guide*
  Procedures for replacing or upgrading hardware components of the IDPA.

- *Integrated Data Protection Appliance Security Configuration Guide*
  Information about the security features that are used to control user and network access, monitor system access and use, and support the transmission of storage data.

- *Integrated Data Protection Appliance Software Compatibility Guide*
  Information about software components and versions that are used in the IDPA product.

Service video resources

You can obtain additional service video training and information at https://education.emc.com. Videos include:

- Integrated Data Protection Appliance (IDPA) DP4400 CRU Maintenance Power Supply Replacement
- Integrated Data Protection Appliance (IDPA) DP4400 CRU Maintenance Power Front Drive Replacement
- Integrated Data Protection Appliance (IDPA) DP4400 CRU Maintenance Power Mid-Drive Replacement
- Integrated Data Protection Appliance (IDPA) DP4400 CRU Maintenance Power Rear Drive Replacement
- Integrated Data Protection Appliance (IDPA) DP4400 CRU Maintenance Cooling Fan Replacement
- Integrated Data Protection Appliance (IDPA) DP4400 CRU Maintenance DIMM Replacement
- Integrated Data Protection Appliance (IDPA) DP4400 CRU Maintenance BOSS Card M2 Storage Replacement
- Integrated Data Protection Appliance (IDPA) DP4400 CRU Maintenance NIC Card Slot 1 Replacement
- Integrated Data Protection Appliance (IDPA) DP4400 CRU Maintenance NIC Card Slot 2 Replacement
- Integrated Data Protection Appliance (IDPA) DP4400 CRU Maintenance NIC Daughter Card Replacement