


Dell EMC PowerEdge C6400

Installation and Service Manual

Notes, cautions, and warnings

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

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

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

Chapter 1: Dell EMC PowerEdge C6400 overview.....	5
Supported configurations.....	5
Front view of the Dell EMC PowerEdge C6400 enclosure.....	7
Front view of the control panels.....	7
Back view of the enclosure with sleds.....	9
Sled to hard drive mapping.....	9
Expander zoning.....	10
Diagnostic indicators.....	11
Drive indicator codes.....	11
Power supply unit indicator codes.....	12
Locating the Service Tag of your system.....	13
System information label.....	14
 Chapter 2: Installing and removing enclosure components.....	 18
Safety instructions.....	18
Before working inside your system.....	19
After working inside your system.....	19
Recommended tools.....	19
Dell EMC PowerEdge C6420 sled.....	19
Sled Installation Guidelines.....	19
Removing a sled	20
Installing a sled	22
Drives.....	24
Removing a drive blank.....	24
Installing a drive blank.....	25
Removing a drive carrier.....	25
Installing a drive carrier.....	26
Removing the drive from the drive carrier.....	27
Installing a drive into the drive carrier.....	28
Power supply units.....	29
Fault tolerant redundancy.....	29
Removing a power supply unit.....	30
Installing a power supply unit.....	31
System cover.....	32
Removing the system cover.....	32
Installing the system cover.....	33
Backplane cover.....	34
Removing the backplane cover.....	34
Installing the backplane cover.....	35
Cooling fans	36
Removing a cooling fan.....	36
Installing a cooling fan.....	36
Removing the cooling fan cage.....	37
Installing the cooling fan cage.....	38

Power interposer board.....	39
Removing the power interposer board.....	39
Installing the power interposer board.....	41
Chassis management board.....	42
Removing the chassis management board.....	42
Installing the chassis management board.....	43
Linking board.....	44
Removing the linking board.....	44
Installing the linking board.....	45
Cable clip bracket.....	47
Removing the cable clip bracket.....	47
Installing the cable clip bracket.....	48
Midplane.....	49
Removing the right midplane.....	49
Installing the right midplane.....	50
Removing the left midplane.....	51
Installing the left midplane.....	52
Midplane power cable routing.....	54
Drive cage.....	54
Removing the 2.5 inch drive cage.....	54
Installing the 2.5 inch drive cage.....	55
Removing the 3.5 inch drive cage.....	56
Installing the 3.5 inch drive cage.....	57
Backplanes and expander board.....	58
Backplane.....	58
Removing the backplane.....	64
Installing the backplane.....	65
Removing the backplane expander board.....	66
Installing the backplane expander board.....	67
Control panel.....	68
Removing the control panel.....	68
Installing the control panel.....	69
Thermal sensor board.....	71
Removing the thermal sensor board	71
Installing the thermal sensor board.....	72
Chapter 3: Getting help.....	73
Contacting Dell.....	73
Documentation feedback.....	73
Accessing system information by using QRL.....	73
Quick Resource Locator for C6400 and C6420 systems.....	74
Receiving automated support with SupportAssist	74
Recycling or End-of-Life service information.....	74
Chapter 4: Documentation resources.....	75

Dell EMC PowerEdge C6400 overview

The PowerEdge C6400 is an ultra-dense 2U enclosure that can support up to four independent two-socket (2S) sleds. The PowerEdge C6400 enclosure supports the following drive configurations:

- up to 24 x 2.5-inch SAS or SATA drives
- up to 8 x 2.5-inch NVMe drives, with 16 x 2.5-inch SAS or SATA drives
- up to 12 x 3.5-inch SAS or SATA drives
- diskless no backplane

Topics:

- [Supported configurations](#)
- [Front view of the Dell EMC PowerEdge C6400 enclosure](#)
- [Front view of the control panels](#)
- [Back view of the enclosure with sleds](#)
- [Sled to hard drive mapping](#)
- [Expander zoning](#)
- [Diagnostic indicators](#)
- [Locating the Service Tag of your system](#)
- [System information label](#)

Supported configurations

The PowerEdge C6400 system supports the following configurations:

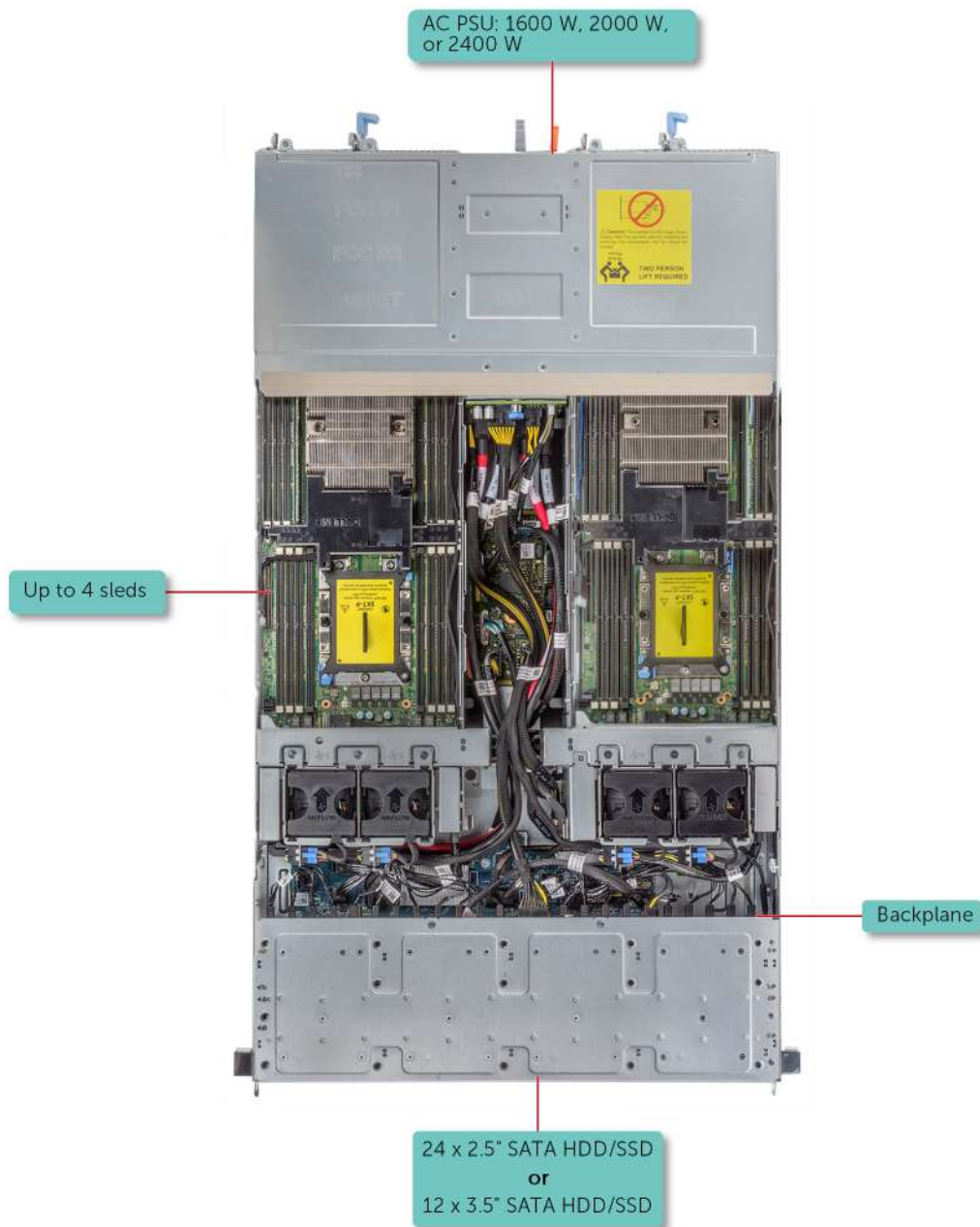


Figure 1. Supported configurations for PowerEdge C6400

Chassis configuration summary table

Table 1. Chassis configuration summary table

PE C6400 Chassis Config.	PEC6420 support	PEC6525 support
24 x 2.5" SAS/SATA Backplane	Yes	Yes
8 x 2.5" NVME + 16 X 2.5" SAS/SATA backplane	Yes	Yes
12 x 3.5" SAS/SATA Backplane	Yes	Yes
Diskless No backplane	Yes	Yes
Expander Backplane	Yes	No
24 x 2.5" All/PURE NVME backplane	No	Yes

Front view of the Dell EMC PowerEdge C6400 enclosure

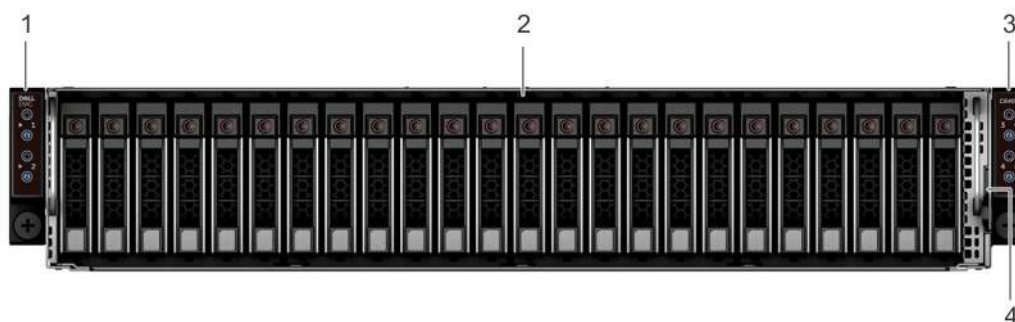


Figure 2. Front view of the enclosure with 24 x 2.5-inch drives

- 1. Left control panel
- 2. Drive bay
- 3. Right control panel
- 4. EST tag

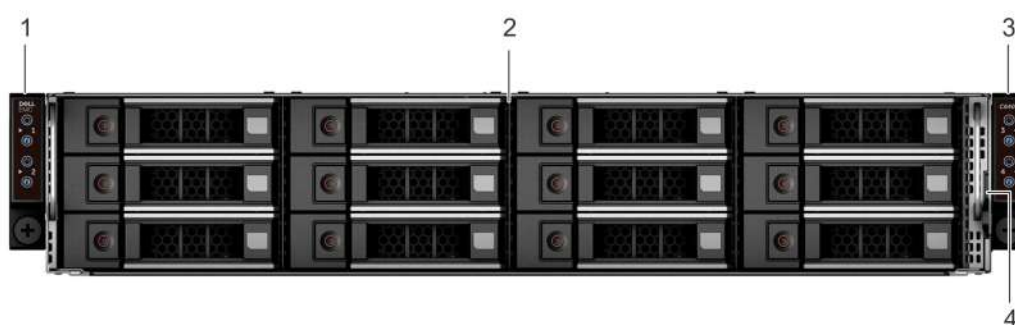


Figure 3. Front view of the enclosure with 12 x 3.5-inch drives

- 1. Left control panel
- 2. Drive bay
- 3. Right control panel
- 4. EST tag

Front view of the control panels

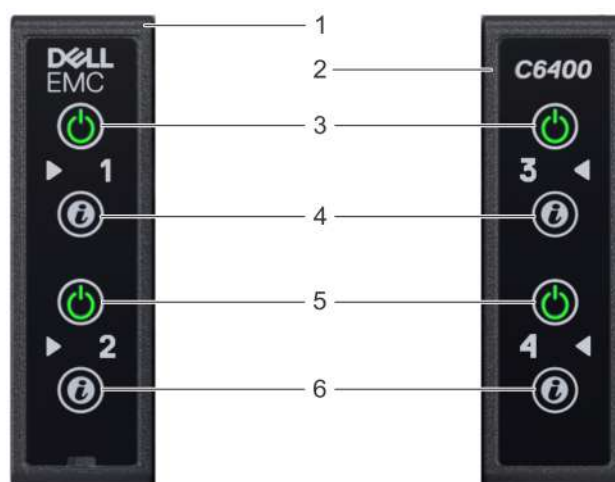






Figure 4. Front view of the left and right control panels

Table 2. Control panel

Item	Indicator or button	Icon	Description
1	Left control panel	-	The power-on indicator and system identification LED for sleds 1 and 2 are on the left control panel.
2	Right control panel	-	The power-on indicator and system identification LED for sleds 3 and 4 are on the right control panel.
3	Power-on indicator or system state indicator or power button for sleds 1 and 3		<p>Press the power button to turn the sled on or off.</p> <p>The power-on indicator turns amber when a critical system event occurs.</p> <p>i NOTE: To gracefully shut down an ACPI-compliant operating system, press the power button.</p>
4	System identification button for sleds 1 and 3		<p>Press the system ID button:</p> <ul style="list-style-type: none"> To locate a particular sled within the enclosure. To turn the system ID on or off. <p>i NOTE: If the sled stops responding during POST, press and hold the system ID button (for more than five seconds) to enter the BIOS progress mode.</p>
5	Power-on indicator or system state indicator or power button for sleds 2 and 4		<p>Press the power button to turn the sled on or off.</p> <p>The power-on indicator turns amber when a critical system event occurs.</p> <p>i NOTE: To gracefully shut down an ACPI-compliant operating system, press the power button.</p>
6	System identification button for sleds 2 and 4		<p>Press the system ID button:</p> <ul style="list-style-type: none"> To locate a particular sled within the enclosure. To turn the system ID on or off. <p>i NOTE: If the sled stops responding during POST, press and hold the system ID button (for more than five seconds) to enter the BIOS progress mode.</p>

Back view of the enclosure with sleds

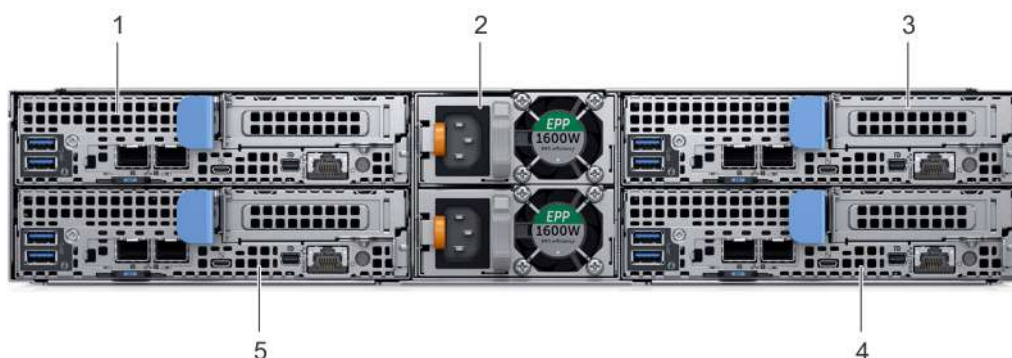


Figure 5. Back view of the enclosure with sleds

1. Sled 3
2. Power supply unit (2)
3. Sled 1
4. Sled 2
5. Sled 4

NOTE: For more information about sled installation sequence, see [Sled Installation Guidelines](#)

Sled to hard drive mapping

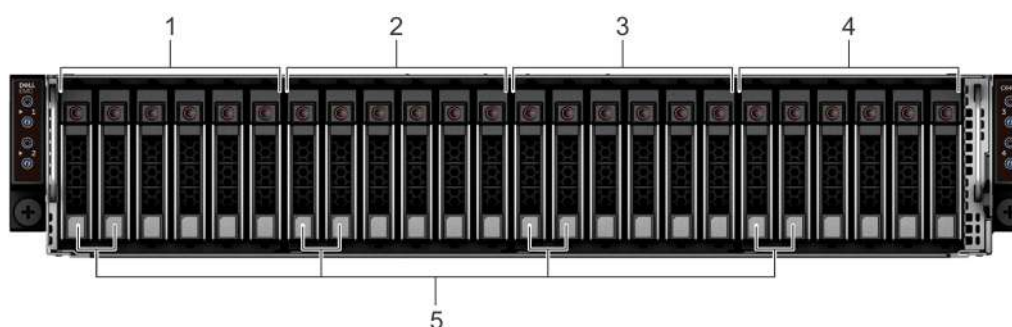


Figure 6. Sled to drive mapping for 24 x 2.5-inch drive configuration

1. Drives 0–5 mapped to sled 1
2. Drives 6–11 mapped to sled 2
3. Drives 12–17 mapped to sled 3
4. Drives 18–23 mapped to sled 4
5. (Optional) NVMe hard drive location

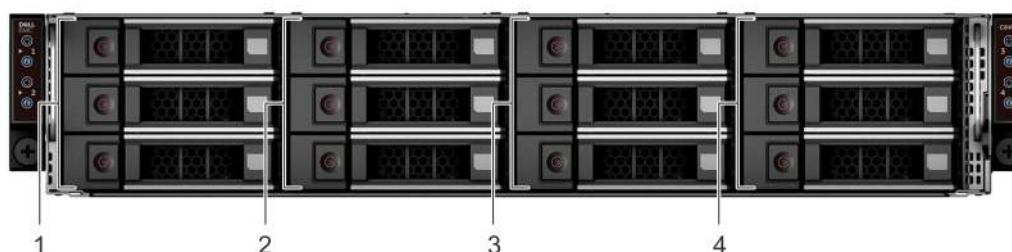


Figure 7. Sled to drive mapping for 12 x 3.5-inch drive configuration

1. Drives 0–2 mapped to sled 1
2. Drives 3–5 mapped to sled 2
3. Drives 6–8 mapped to sled 3
4. Drives 9–11 mapped to sled 4

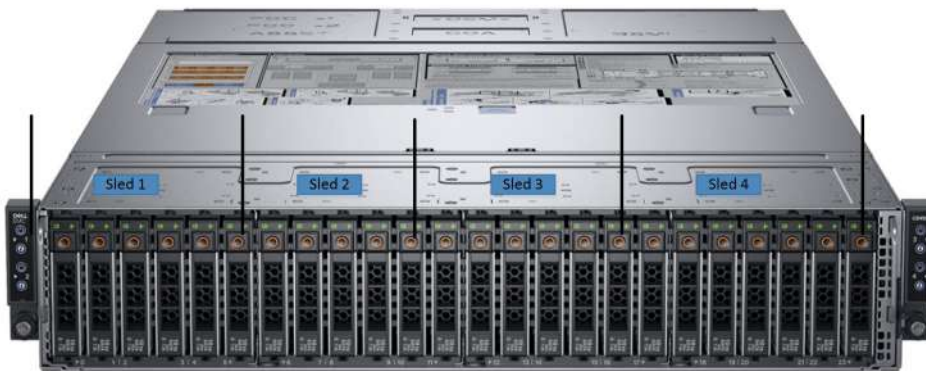
NOTE: The warranty of the drives are linked to the Service Tag of the corresponding sled.

Expander zoning

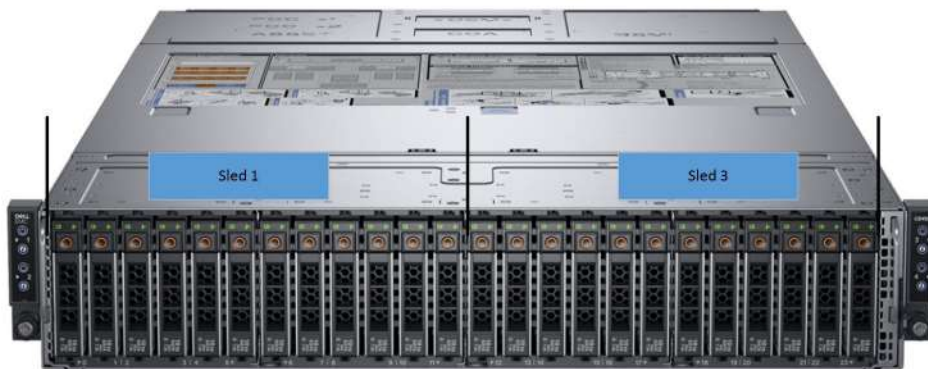
A SAS expander board allows higher, single-volume hard drive configurations. An integrated expander device expands each sleds hard drive footprint.

The Dell EMC PowerEdge C6400 enclosure supports four sled access to a single expander controller at the same time. The enclosure provides two expander zoning options:

- Up to 6 SAS/SATA device of each sled in Split Mode (6+6+6+6)



- Up to 12 SAS/SATA device of sled 1 and sled 3 in Zoning Mode (12+12)



i NOTE:

- Install expander firmware 2.07 or later to support these configurations
- The expander mode works only with a PERC card, and is not supported by the onboard SATA controller.

Diagnostic indicators

The diagnostic indicators on the system indicate operation and error status.

Drive indicator codes

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



Figure 8. Drive indicators on the drive and the mid drive tray backplane

1. Drive activity LED indicator

2. Drive status LED indicator
3. Drive

i NOTE: If the drive is in the Advanced Host Controller Interface (AHCI) mode, the status LED indicator does not turn on.

Table 3. Drive indicator codes

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

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 if a power fault has occurred.

i NOTE: The 2400 W and 2000 W PSUs use a C19 or C20 connector. The 1600 W PSUs use a C13 or C14 connector.

i NOTE: The 2600 W PSU (DPN 9D4R6) that is supported only on Dell EMC PowerEdge C6525 and Dell EMC PowerEdge C6520 sleds uses a C19-C14 connector. The 2000 W, 2400 W, 2600 W PSUs (DPN 9YJ53 and DPN 9D4R6) use a C20 AC inlet connector and the 1600 W PSU uses a C14 AC inlet connector.

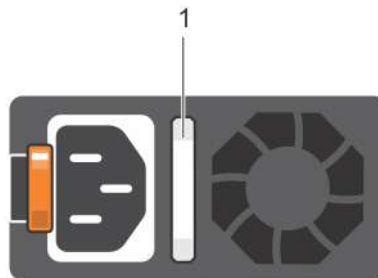


Figure 9. AC PSU status indicator

1. AC PSU status indicator/handle

Table 4. AC PSU status indicator codes

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.

Table 4. AC PSU status indicator codes (continued)

Power indicator codes	Condition
Blinking green and turns off	<p>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.</p> <p>⚠ CAUTION: 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.</p> <p>⚠ 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.</p> <p>⚠ 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.</p> <p>⚠ CAUTION: If two PSUs are used, they must be of the same type and have the same maximum output power.</p>

Locating the Service Tag of your system

Your system is identified by a unique Express Service Code and Service Tag number. The Express Service Code and Service Tag are found on the front of the enclosure by pulling out the EST tag. This information is used by Dell to route support calls to the appropriate personnel.

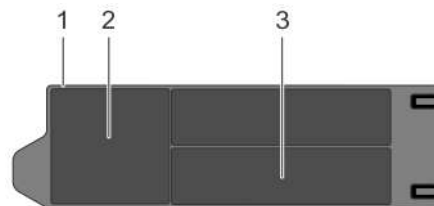


Figure 10. Locating the Service Tag of your system

1. Information tag (top view)
2. QR code label
3. Express Service Tag label

System information label

Sled service information

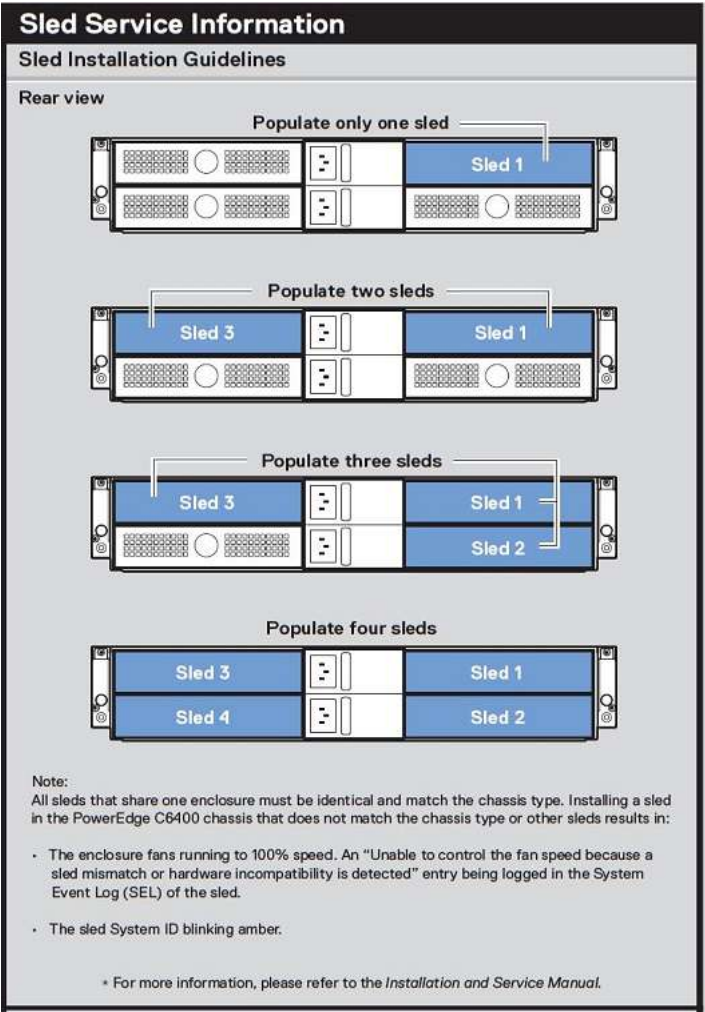


Figure 11. Sled service information

Cable routing

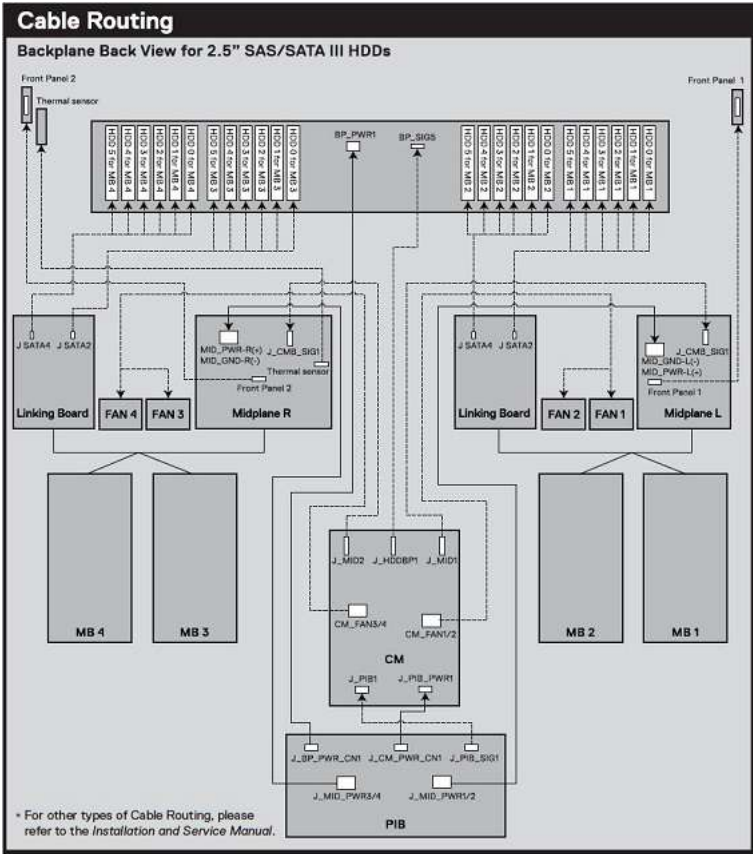


Figure 12. Cable routing

Mechanical overview

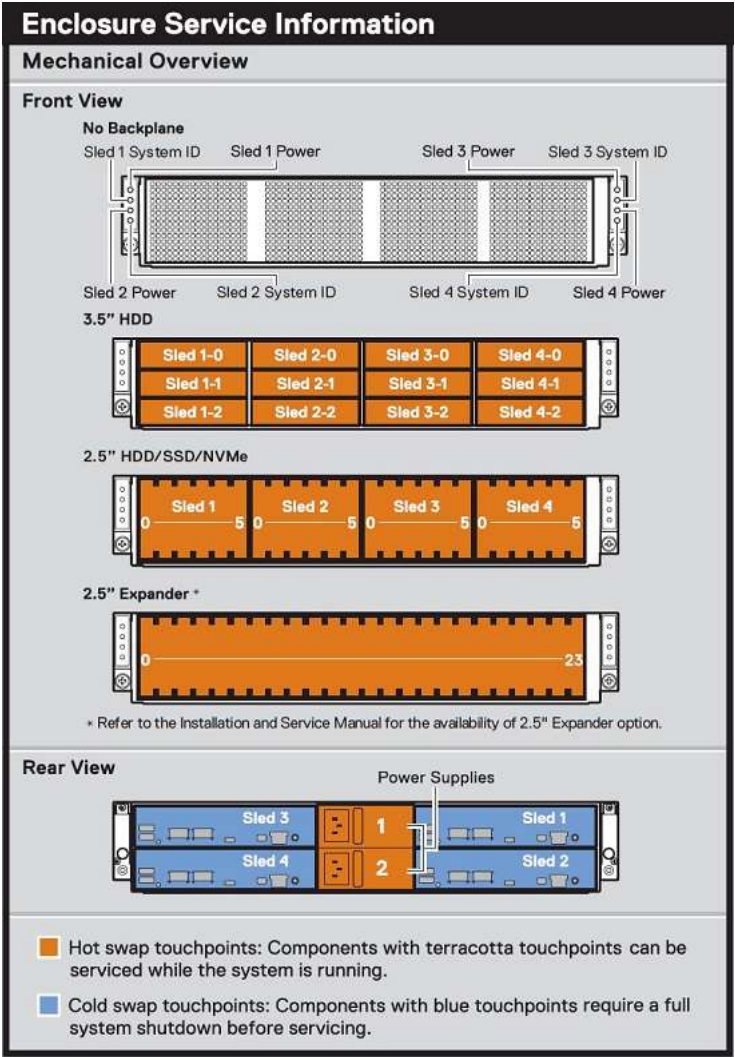


Figure 13. Mechanical overview

Link board and Drive cage

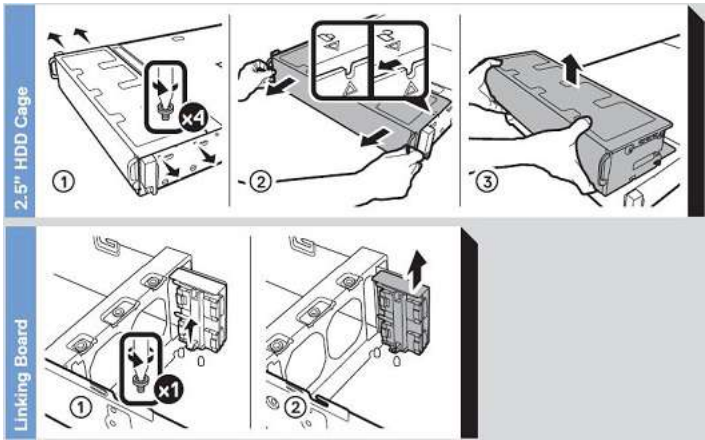










Figure 14. Link board and Drive cage


Jumper settings


Jumper Settings		
Jumper	Setting	Description
 PWRD_EN	 (default)	BIOS password is enable.
		BIOS password is disable. iDRAC local access unlocked at next AC power cycle. iDRAC password reset is enabled in F2 iDRAC setting menu.
 NVRAM_CLR	 (default)	BIOS configuration settings retained at system boot.
		BIOS configuration setting cleared at system boot.


Icon Legend

 CPU

 PCI

 Fan

 Memory Bank

 System ID

EST Express Service Tag


 Shared Service Port /MGMT

Figure 15. Jumper settings

System tasks

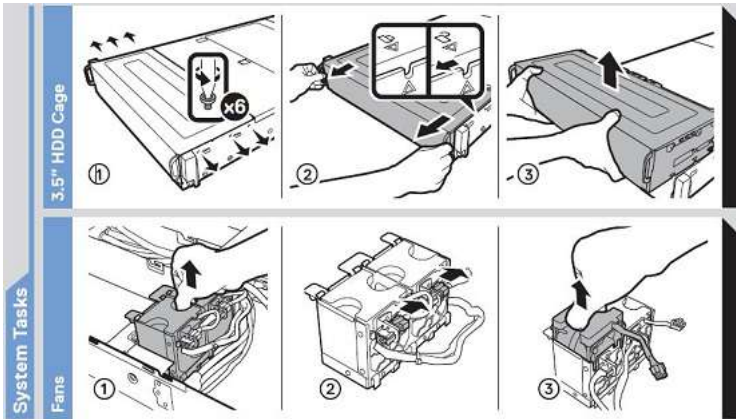



Figure 16. System tasks

Installing and removing enclosure components

Topics:


- [Safety instructions](#)
- [Before working inside your system](#)
- [After working inside your system](#)
- [Recommended tools](#)
- [Dell EMC PowerEdge C6420 sled](#)
- [Drives](#)
- [Power supply units](#)
- [System cover](#)
- [Backplane cover](#)
- [Cooling fans](#)
- [Power interposer board](#)
- [Chassis management board](#)
- [Linking board](#)
- [Cable clip bracket](#)
- [Midplane](#)
- [Drive cage](#)
- [Backplanes and expander board](#)
- [Control panel](#)
- [Thermal sensor board](#)


Safety instructions


 **NOTE:** 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.

 **NOTE:** It is recommended that you always use an antistatic mat and antistatic strap 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.

Before working inside your system

Prerequisites

Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Power off the system, including all attached peripherals.
2. Disconnect the system from the electrical outlet and disconnect the peripherals.
3. If applicable, remove the system from the rack.
For more information, see the *Rack Installation Guide* at www.dell.com/poweredgemanuals.
4. Remove the system cover.

After working inside your system

Prerequisites

Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Install the system cover.
2. If applicable, install the system into the rack.
For more information, see the *Rack Installation Guide* at www.dell.com/poweredgemanuals.
3. Reconnect the peripherals and connect the system to the electrical outlet.
4. Power on the attached peripherals and then turn on the system.


Recommended tools


You need the following tools to perform the removal and installation procedures:

- Phillips #1 screwdriver
- Phillips #2 screwdriver
- 1/4 inch flat head screwdriver
- Wrist grounding strap
- ESD mat

Dell EMC PowerEdge C6420 sled

Sled Installation Guidelines

 **NOTE:** Ensure to install a sled blank in all the empty slots. Operating the enclosure without a blank results in overheating.

 **NOTE:** For optimized thermal operation, ensure to follow the sled population sequence mentioned below:

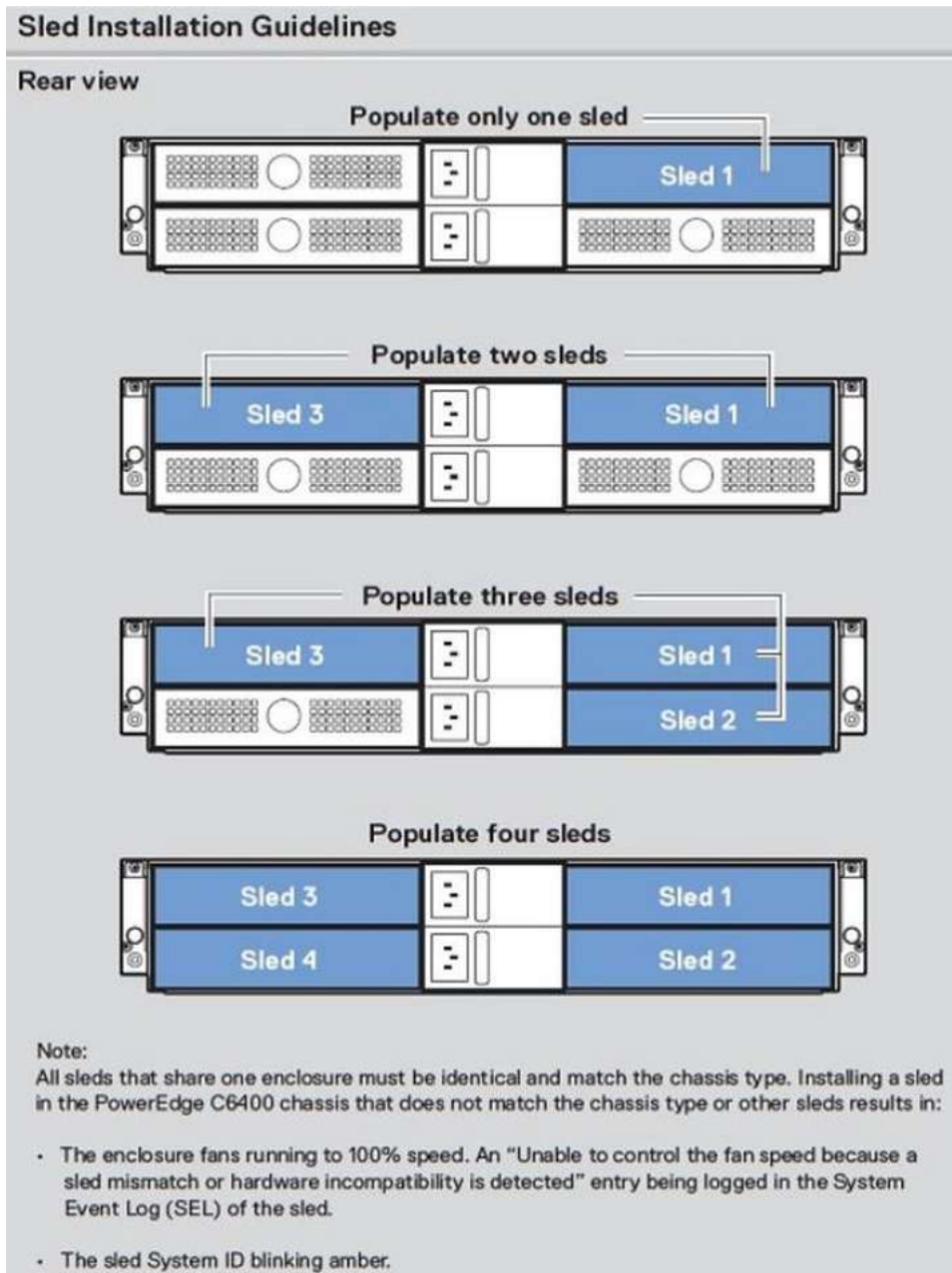


Figure 17. Sled Installation Guidelines

Removing a sled

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your enclosure](#).

i **NOTE:** The process of removing a sled blank is similar to removing a sled.

Steps

Press the retaining latch and using the sled pull handle, slide the sled out of the enclosure horizontally, ensuring that the sled is supported from beneath.

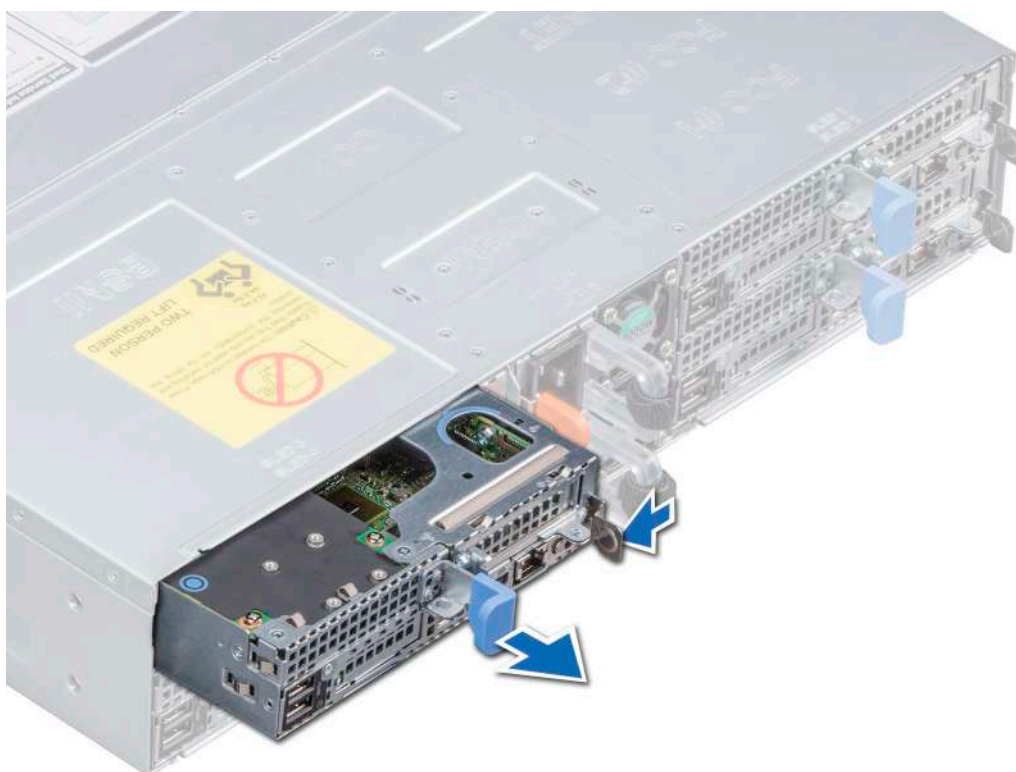


Figure 18. Removing a sled

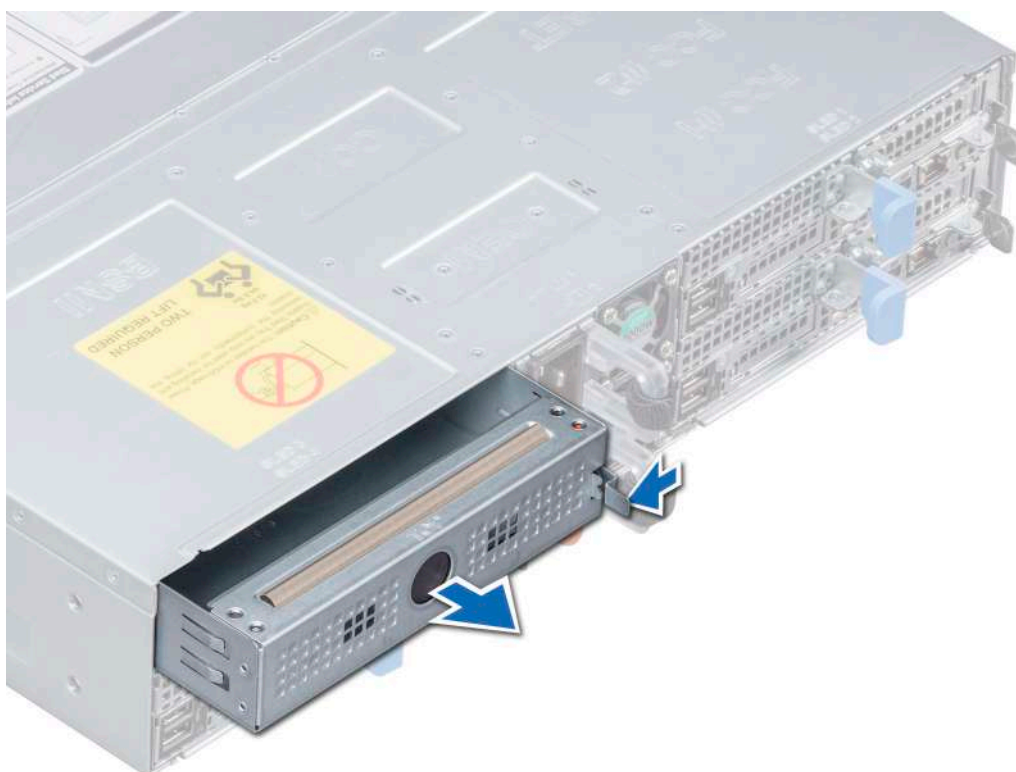


Figure 19. Removing a sled blank

Next steps

1. Install the sled into the enclosure.

NOTE: If the sled is not being replaced immediately, a sled blank must be installed to ensure proper cooling of the system.

Installing a sled

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. If installed, [remove the sled blank](#).

Steps

1. Align the sled to the enclosure horizontally to insert the sled into the enclosure.

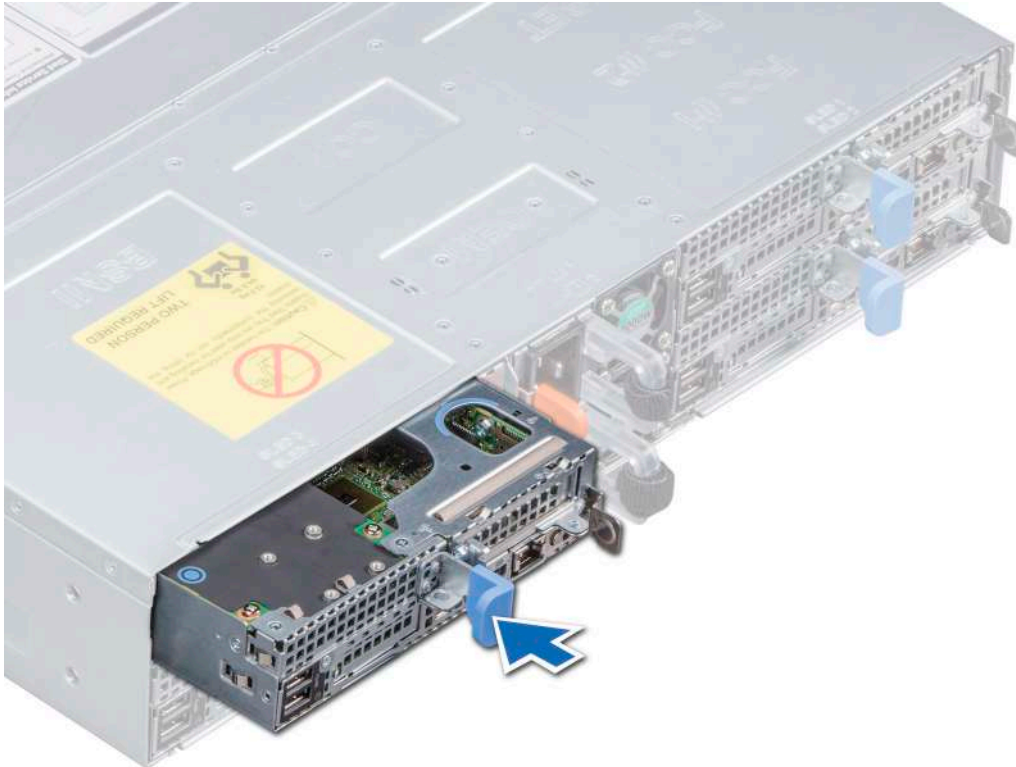


Figure 20. Installing a sled

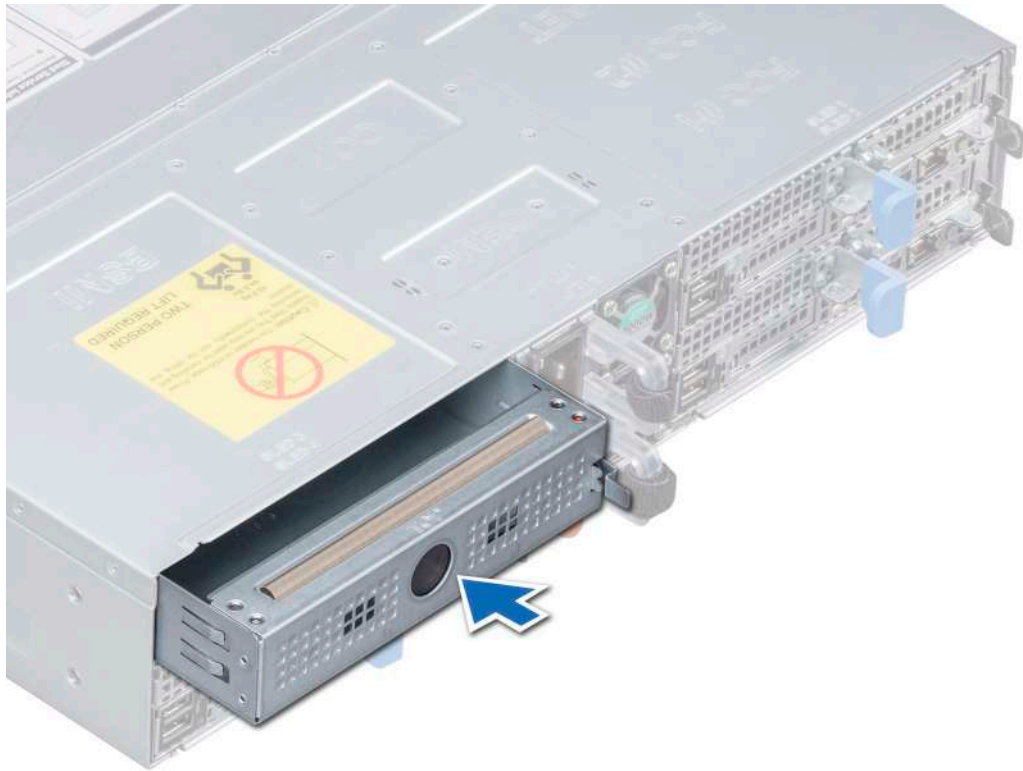


Figure 21. Installing a sled blank

2. Push the blue retention latch to slide the sled into the enclosure, and stop the sled at a distance of 20-30 mm before complete insertion of the sled as shown in the image below.

CAUTION: To avoid any damages to the pins on the sled, do not force the sled into the enclosure. Follow the two-position insertion and gently slide the sled into the enclosure.

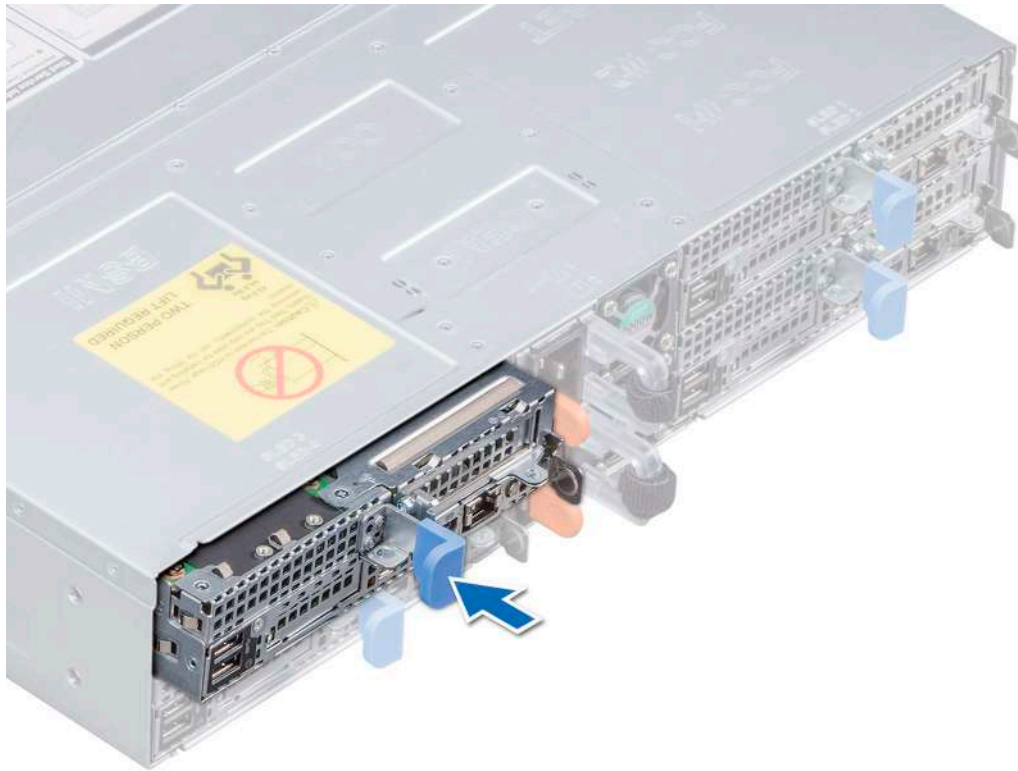


Figure 22. Stop the sled at a distance of 20-30 mm before complete insertion

3. Slide the blue retention latch gently, until the sled locks into the place.

Next steps

1. Follow the procedure listed in [After working inside your enclosure](#).

NOTE: To add the Service Tag of the system board to match the Service Tag of the physical node, contact Dell Technical Support.

Drives

CAUTION: Before attempting to remove or install a 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 drive is being formatted. Doing so can cause a drive failure.

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

Removing a drive blank

The procedure for removing 2.5-inch and 3.5-inch drive blanks is identical.

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

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

CAUTION: To maintain proper system cooling, drive blanks must be installed in all empty drive slots.

 **CAUTION:** Mixing drive blanks from previous generations of PowerEdge servers is not supported.

Steps

Press the release button, and slide the drive blank out of the drive slot.



Figure 23. Removing a drive blank

Next steps

1. [Install a drive or a drive blank.](#)

Installing a drive blank

The procedure for installing 2.5-inch and 3.5-inch drive blanks is identical.

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

 **CAUTION:** Mixing drive blanks from previous generations of PowerEdge servers is not supported.

Steps

Insert the drive blank into the drive slot, and push the blank until the release button clicks into place.



Figure 24. Installing a drive blank

Removing a drive carrier

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Using the management software, prepare the drive for removal.

If the drive is online, the green activity or fault indicator flashes while the drive is turning off. When the drive indicators are off, the drive is ready for removal. For more information, see the documentation for the storage controller.

CAUTION: Before attempting to remove or install a 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 drive removal and insertion.

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

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

Steps

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



Figure 25. Removing a drive carrier

Next steps

1. Follow the procedure listed in [After working inside your enclosure..](#)
2. [Install a drive carrier.](#)
3. If you are not replacing the drive immediately, insert a drive blank in the empty drive slot to maintain proper system cooling.

Installing a drive carrier

Prerequisites

CAUTION: Before attempting to remove or install a 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 drive removal and insertion.

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

CAUTION: Combining SAS and SATA drives in the same RAID volume is not supported.

CAUTION: When installing a drive, ensure that the adjacent drives are fully installed. Inserting a 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: When a replacement hot swappable drive is installed and the system is powered on, the drive automatically begins to rebuild. Ensure that the replacement drive is blank or contains data that you wish to overwrite. Any data on the replacement drive is immediately lost after the drive is installed.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. If applicable, [remove the drive blank](#).

Steps

1. Press the release button on the front of the drive carrier to open the release handle.
2. Insert and slide the drive carrier into the drive slot.
3. Close the drive carrier release handle until it clicks in place.



Figure 26. Installing a drive carrier

Removing the drive from the drive carrier

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

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

Steps

1. Using a Phillips #1 screwdriver, remove the screws from the slide rails on the drive carrier.
2. Lift the drive out of the drive carrier.



Figure 27. Removing the drive from the drive carrier

Next steps

1. If applicable, [install the drive into the drive carrier](#).

Installing a drive into the drive carrier

Prerequisites

CAUTION: Mixing drive carriers from other generations of PowerEdge servers is not supported.

NOTE: When installing a drive into the drive carrier, ensure that the screws are torqued to 4 in-lbs.

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Insert the drive into the drive carrier with the connector end of the drive towards the back of the carrier.
2. Align the screw holes on the drive with the screws holes on the drive carrier.
When aligned correctly, the back of the drive is flush with the back of the drive carrier.
3. Using a Phillips #1 screwdriver, secure the drive to the drive carrier with screws.



Figure 28. Installing a drive into the drive carrier

Next steps

Install the drive carrier.

Power supply units

CAUTION: The PSUs must have the Extended Power Performance (EPP) label. Mixing PSUs (even the PSUs that have the same power rating) from previous generations of PowerEdge servers is not supported. Mixing PSUs results in a PSU mismatch condition or failure to turn the system on.

Your system supports two 2400 W AC PSUs.

NOTE: For more information, see the PowerEdge T440 Technical Specs at www.dell.com/poweredgemanuals.

Fault tolerant redundancy

Policy Budgeting

Fault Tolerant Redundancy is a hybrid redundancy mode which uses the power capacity limits of a single Power Supply Unit for Power Budget Checks, similar to Grid Redundancy, but enforces added performance limiting after redundancy is lost. Previous generation modular sleds will still work with Fault Tolerant Redundancy enabled, but they treat it identically to Grid Redundancy.

When the maximum potential power needs of installed chassis components exceeds the capacity of a single Power Supply, the Chassis Management Controller (CMC) will deny power on to further chassis components. The Power Budget Checks for Fault Tolerant Redundancy ensure that the Shared Infrastructure Chassis will remain operational in the event of maximum potential workload conditions at the time of an AC Grid or PSU Supply failure. Using the maximum potential is a conservative target that ensures continued operation across the wide range of potential customer workloads for a given configuration.

Policy philosophy

Similar to Grid Redundancy, Fault Tolerant Redundancy is a conservative redundancy policy that ensures that the Shared Infrastructure Chassis and all installed components remain operational with no risk of shutdown in the event of an AC Grid or Power Supply failure even when all installed components are simultaneously running at their worst case power consumption. New for Fault Tolerant Redundancy is a limit on peak performance that occurs when redundancy is lost. Fault Tolerant

Redundancy can maintain the same conservative standards of redundancy as traditional Grid Redundancy by limiting peak power after redundancy is lost to levels which fit within the surviving Power Supply.

Policy control

As with all Redundancy Policies, while the two Power Supplies remain healthy, load is shared evenly between them and the capacity of both Power Supplies is made available for use. In the event of an AC Grid or Power Supply failure, Power Controls will rapidly engage to restrict the power consumption of the chassis and ensure that consumption is restricted to what a single Power Supply can support. Besides the controls used with all Redundancy Policies, Fault Tolerant Redundancy also implements more performance limiting functionality which restricts the peak power after redundancy loss.

For a fully loaded chassis running at maximum potential power this can result in some observed performance reduction as the chassis Power Control limits are enforced. In practice, customer workloads are often not at the maximum potential power and so practical performance reduction during an AC Grid or Power Supply failure is often minor or even unnoticeable.

Power on behavior after fault

In the event of an AC Grid or Power Supply failure, new chassis components are enabled to power on as long as the maximum potential power of the newly installed chassis components does not exceed the capacity of a single Power Supply when evaluated by the chassis Power Budget Checks. This means that, while customers will note a chassis "Critical" state due to the loss of redundancy, they will observe no difference in which chassis components are enabled to power on (both before and after a redundancy fault). This is because in both cases, the chassis Power Budget Checks use the capacity of only a single Power Supply. This is a key difference from the other Shared Infrastructure Chassis Redundancy Policies.

Logging behavior

As with all Redundancy Policies, when a Power Supply Unit fails, a log message is generated. For the Fault Tolerant Redundancy policy, a log message will also be recorded to note a "Loss of Redundancy". This message indicates that the system is continuing to operate in a Non-Redundant state, and action is necessary to either restore power to a failed AC Grid or replace a failed Power Supply Unit. Details in log messages make it possible to distinguish between these two cases. Finally, in case power-on of a chassis component is denied due to a Power Budget Check, the denial is logged both in CMC logs and iDRAC logs (in the case of compute sleds).

Removing a power supply unit

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. 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.

Steps

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



Figure 29. Removing a power supply unit

Next steps

Install the PSU or install the PSU blank

Installing a power supply unit

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. For systems that support redundant PSU, ensure that both the PSUs are of the same type and have the same maximum output power.

NOTE: The maximum output power (shown in watts) is listed on the PSU label.

Steps

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



Figure 30. Installing a power supply unit

Next steps

1. Connect the power cable to the PSU, and plug the cable into a power outlet.

CAUTION: Secure the power cable to the PSU with the strap provided on the PSU handle.

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.

System cover

Removing the system cover

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Power off the system and all attached peripherals.
3. Disconnect the system from the electrical outlet and disconnect the peripherals.

Steps

1. Press and hold the cover release latch lock down.
2. With your palm on one of the traction pads, slide the system cover toward the rear of the system.
3. Lift the cover from the system.

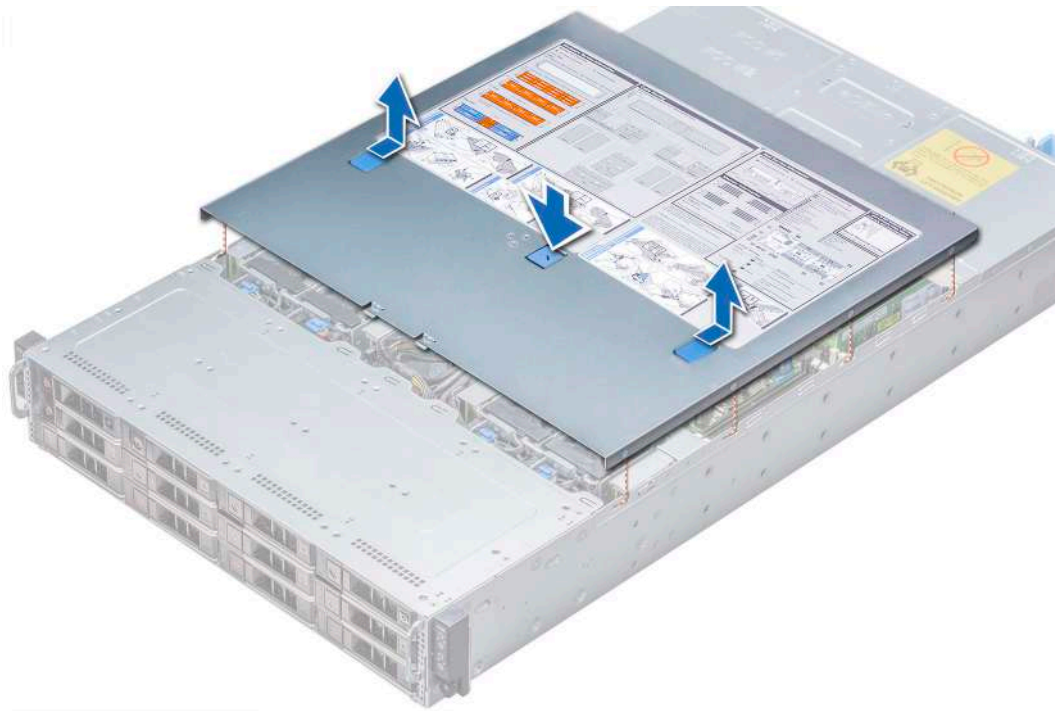


Figure 31. Removing the system cover

Next steps

1. [Install the system cover.](#)

Installing the system cover

Prerequisites

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.

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

Place the system cover on the chassis, and slide it to the front of the chassis until it locks into place.



Figure 32. Installing the system cover

Next steps

1. Reconnect the peripherals, and connect the system to the electrical outlet.
2. Power on the system, and all attached peripherals.

Backplane cover

Removing the backplane cover

Prerequisites

NOTE: This procedure is not applicable for enclosures with the 3.5-inch hard drive configuration.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your enclosure](#).

Steps

1. Using the Phillips #1 screwdriver, remove the screws that secure the backplane cover to the enclosure.
2. Slide the backplane cover toward the back of the enclosure and lift the cover away.

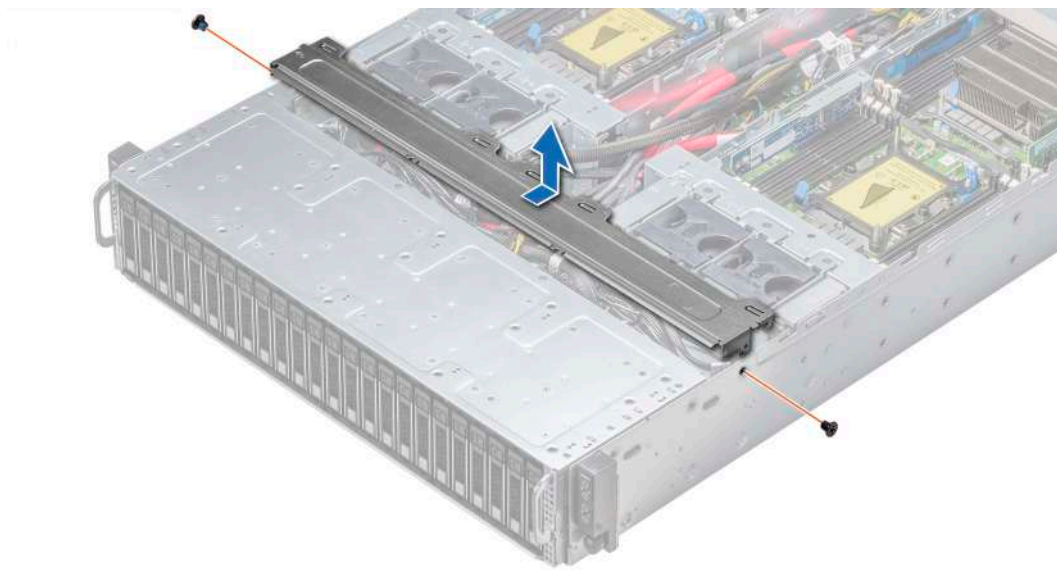


Figure 33. Removing the backplane cover

Next steps

1. [Install the backplane cover.](#)

Installing the backplane cover

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Align the screw holes on the backplane cover with the screw holes on the chassis by sliding the cover toward the front of the enclosure.
2. Using the Phillips #1 screwdriver, tighten the screws to secure the backplane cover to the enclosure.

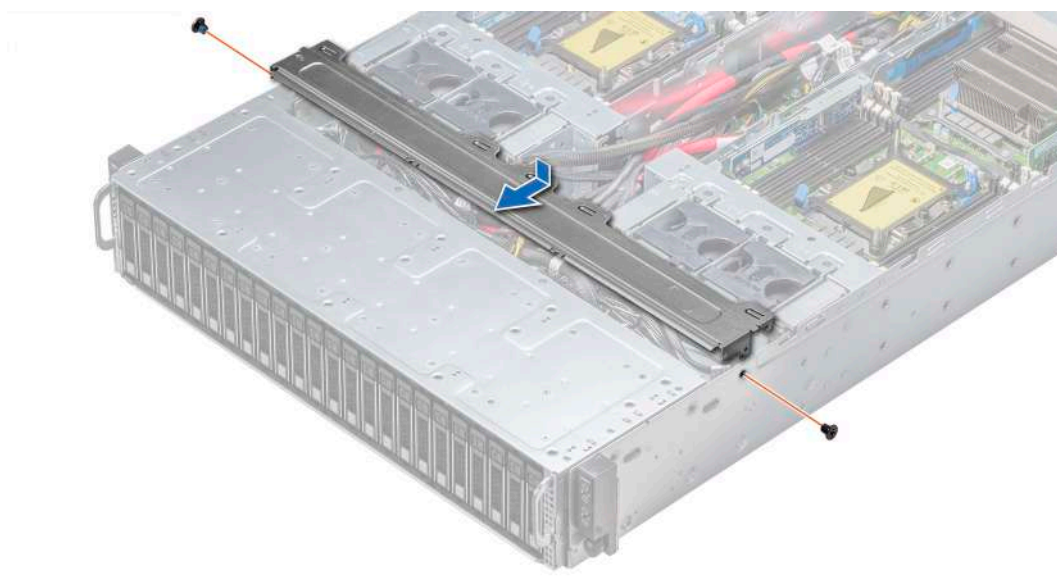


Figure 34. Installing the backplane cover

Next steps

1. Follow the procedure listed in [After working inside your enclosure](#).

Cooling fans

Removing a cooling fan

Prerequisites

- WARNING:** Do not attempt to operate the system without the cooling fans.
- WARNING:** The cooling fan spins for some time after the system is powered off. Allow the fan to stop spinning before removing it from the system.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your enclosure](#).

Steps

Disconnect the fan cable from the connector on the cooling fan cage and lift the fan out.

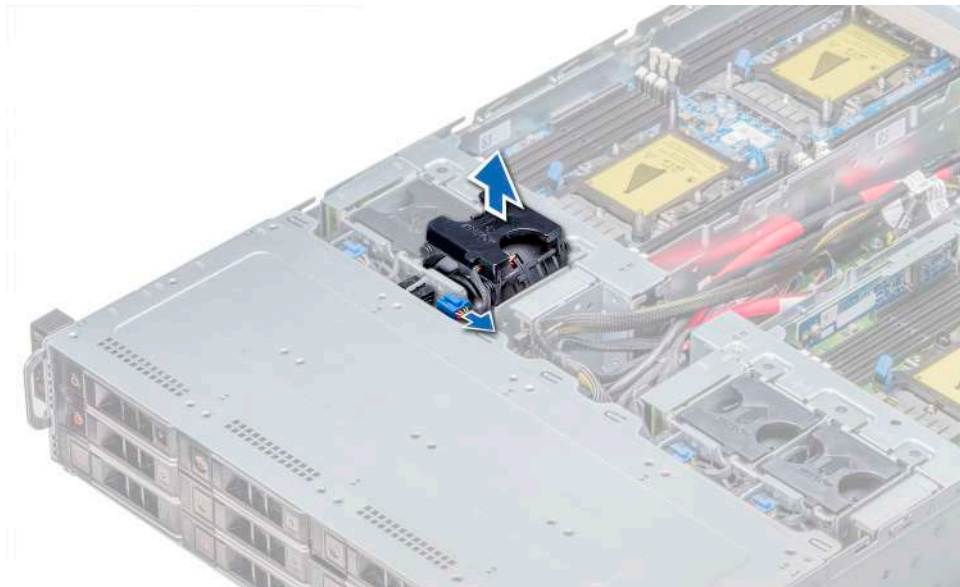


Figure 35. Removing a cooling fan

Next steps

1. [Install a cooling fan](#).
2. For more information about the fan status, see the management software.

Installing a cooling fan

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Align the cooling fan with the fan slot on the cooling fan cage, and push the cooling fan until it is firmly seated.
2. Connect the fan cable to the connector on the cooling fan cage.

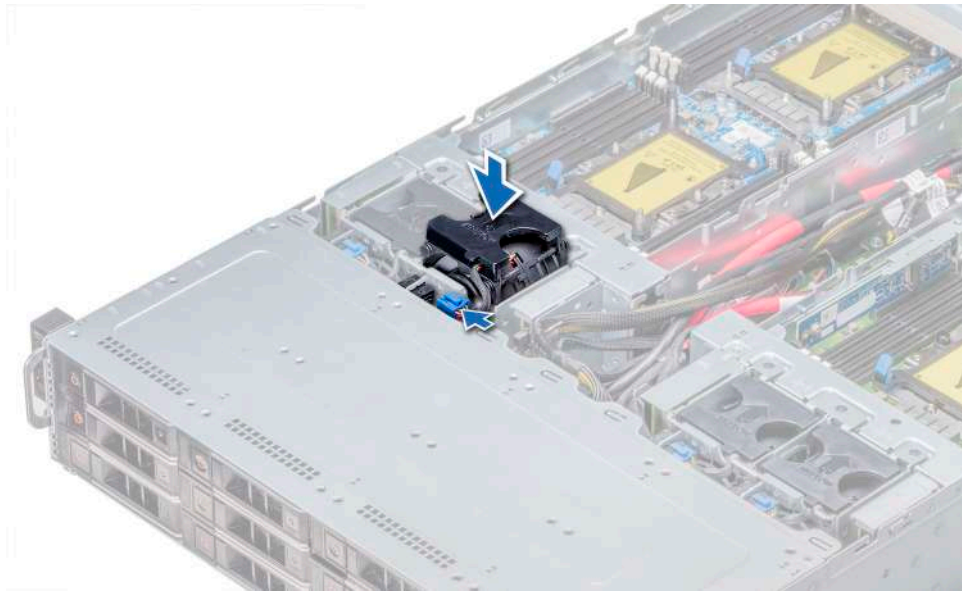


Figure 36. Installing a cooling fan

Next steps

1. Follow the procedure listed in [After working inside your enclosure](#).
2. Check the management software to see if the fan is rotating at the optimal speed.

Removing the cooling fan cage

Prerequisites

⚠ WARNING: Do not attempt to operate the system without the cooling fans.

⚠ WARNING: The cooling fan spins for some time after the system is powered down. Allow the fan to stop spinning before removing it from the system.

ℹ NOTE: Observe the routing of the cables when removing them from the system. Route these cables properly when you replace them to prevent the cables from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your enclosure](#).
3. [Remove the cooling fans](#).

Steps

1. Disconnect the fan power cable from the chassis management board.
2. Lift the cooling fan cage out of the chassis.

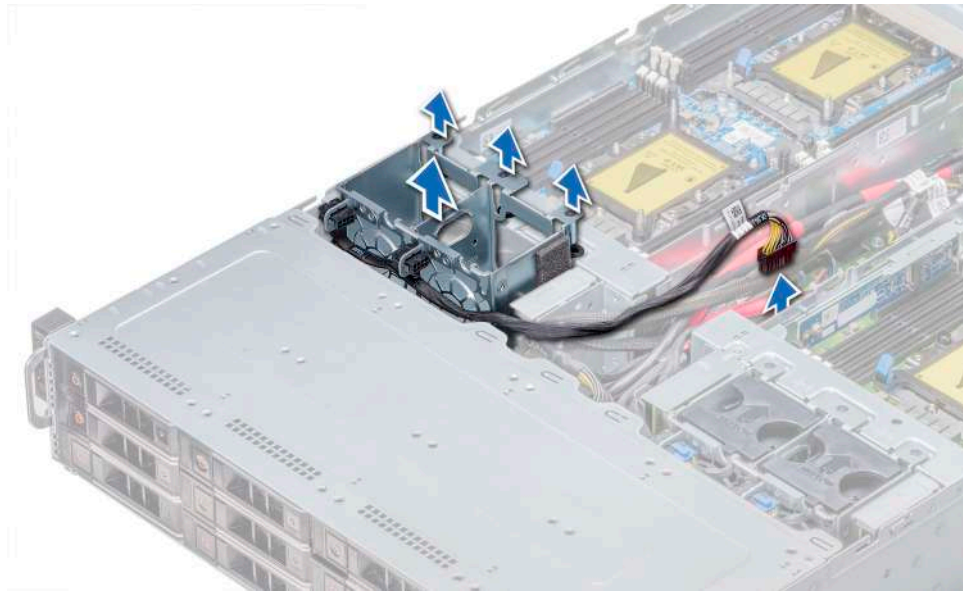


Figure 37. Removing the cooling fan cage

Next steps

1. [Install the cooling fan cage.](#)

Installing the cooling fan cage

Prerequisites

⚠ WARNING: Do not attempt to operate the system without the cooling fans.

i NOTE: Observe the routing of the cables when removing them from the system. Route these cables properly when you replace them to prevent the cables from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Align the guide pins on the cooling fan cage with the guide holes on the chassis.
2. Install the fan cage onto the chassis, and push until it is firmly seated on the guide holes.
3. Connect the fan power cable to the connector on the chassis management board.
To prevent the cable from being damaged, route this cable properly.

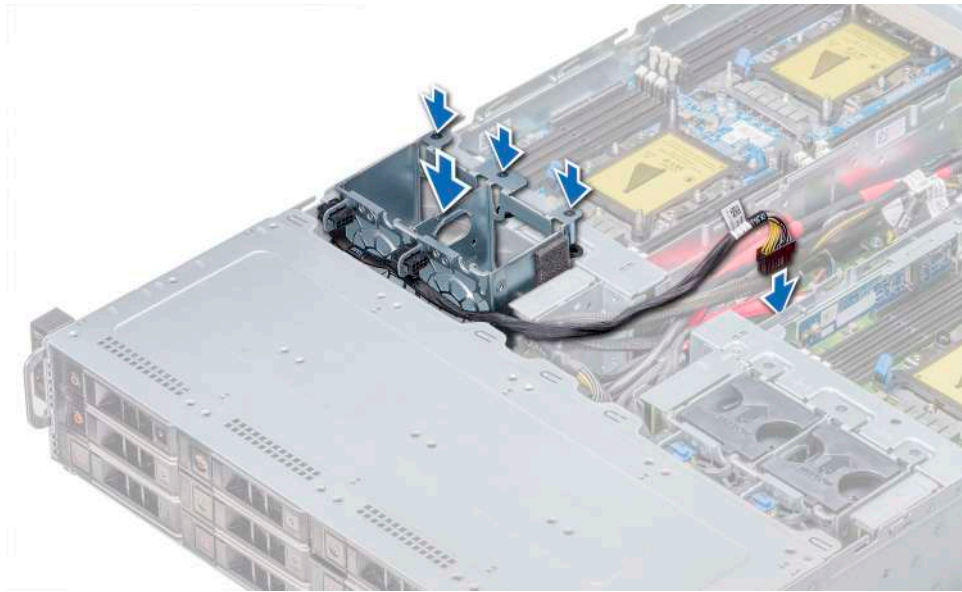


Figure 38. Installing the cooling fan cage

Next steps

1. [Install the cooling fans.](#)
2. Follow the procedure listed in [After working inside your enclosure.](#)
3. Check the management software to see if all the fans are rotating at the optimal speed.

Power interposer board

Removing the power interposer board

Prerequisites

⚠ WARNING: Allow the power interposer board (PIB) to discharge after you power off the system. Handle the PIB by the edges and avoid touching the contact surfaces of the connectors.

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your enclosure.](#)
3. [Remove the power supply units.](#)
4. Disconnect all the cables from the PIB except for the mid-plane power cables.

Steps

1. To release the PIB from the lock on the chassis, pull the blue release latch.
2. Holding the release latch, lift the PIB up and away from the guide hooks on the chassis.
3. Using the Phillips #2 screwdriver, remove the screws that secure the mid-plane power cables to the PIB.

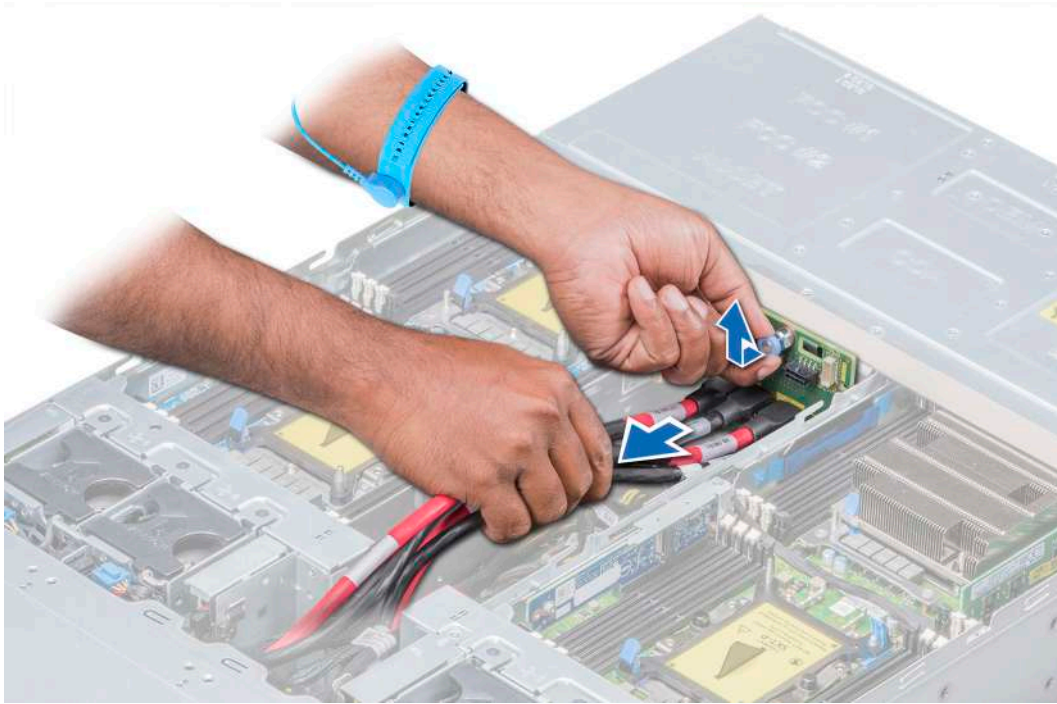


Figure 39. Removing the PIB

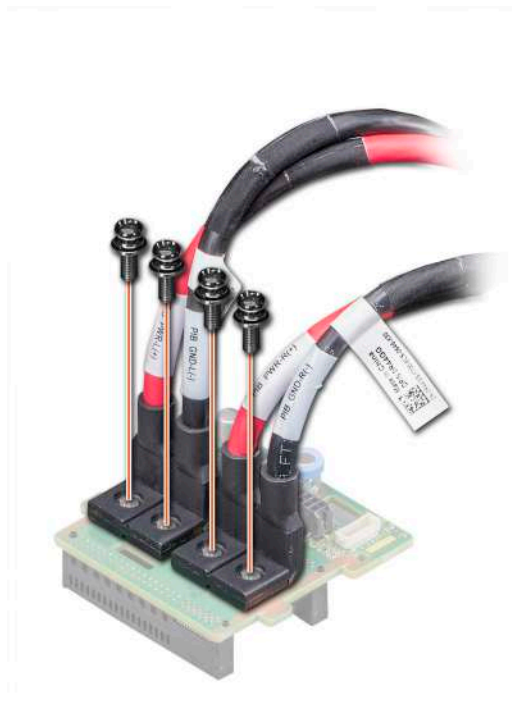


Figure 40. Removing the midplane power cables from the PIB

Next steps

1. [Install the PIB.](#)

Installing the power interposer board

Prerequisites

⚠ WARNING: Allow the power interposer board (PIB) to discharge after you power off the system. Handle the PIB by the edges and avoid touching the contact surfaces of the connectors.

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Using the Phillips #2 screwdriver, replace the screws that secure the midplane power cable to the PIB.

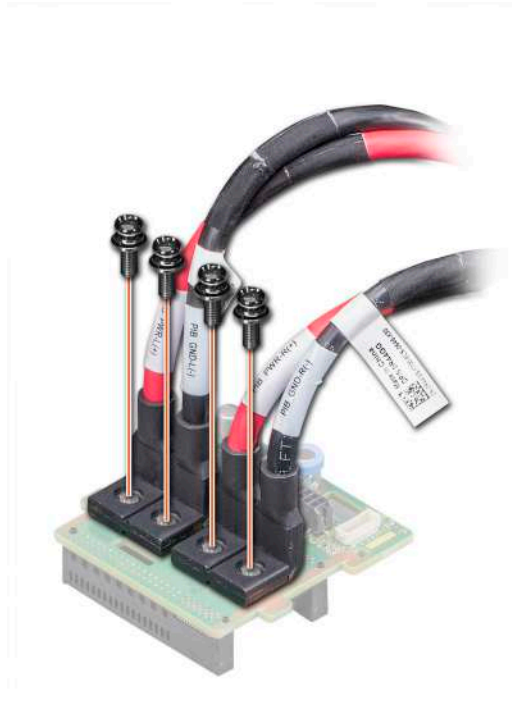


Figure 41. Installing the midplane power cables to the PIB

2. Align and insert the PIB on the guide hooks on the chassis.
3. Push the PIB down to secure it with the lock on the chassis.

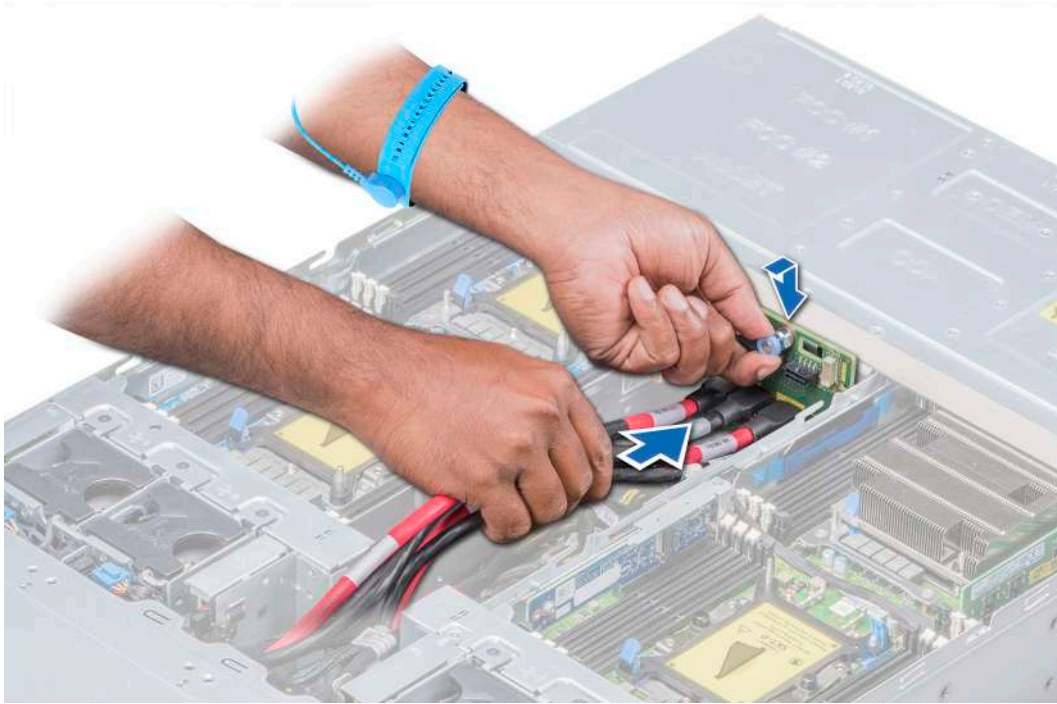


Figure 42. Installing the PIB

Next steps

1. Reconnect all the disconnected cables.
2. [Install the power supply units.](#)
3. Follow the procedure listed in [After working inside your enclosure.](#)

Chassis management board

Removing the chassis management board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your enclosure.](#)
3. [Remove the power supply units.](#)
4. [Remove the power interposer board.](#)
5. Disconnect all the cables that are connected to the chassis management board.

Steps

1. Using the Phillips #2 screwdriver, remove the two screws that secure the chassis management board to the chassis.
2. Sliding the board toward the front of the enclosure, lift the board away after the guide slots are free of the standoffs.

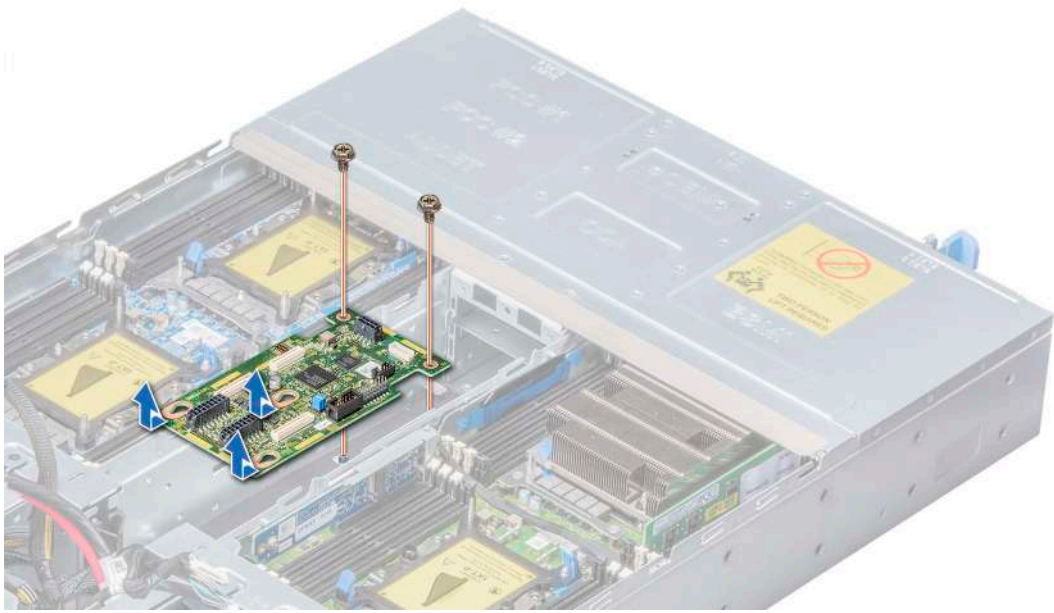


Figure 43. Removing the chassis management board

Next steps

1. [Install the chassis management board.](#)

Installing the chassis management board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#)..

Steps

1. Insert the chassis management board into the enclosure, aligning the guide slots with the standoffs on the chassis.
2. Push the board toward the back of the enclosure to align the screw holes on the board and standoffs chassis.
3. Using the Phillips #2 screwdriver, replace the screws to secure the board in place.

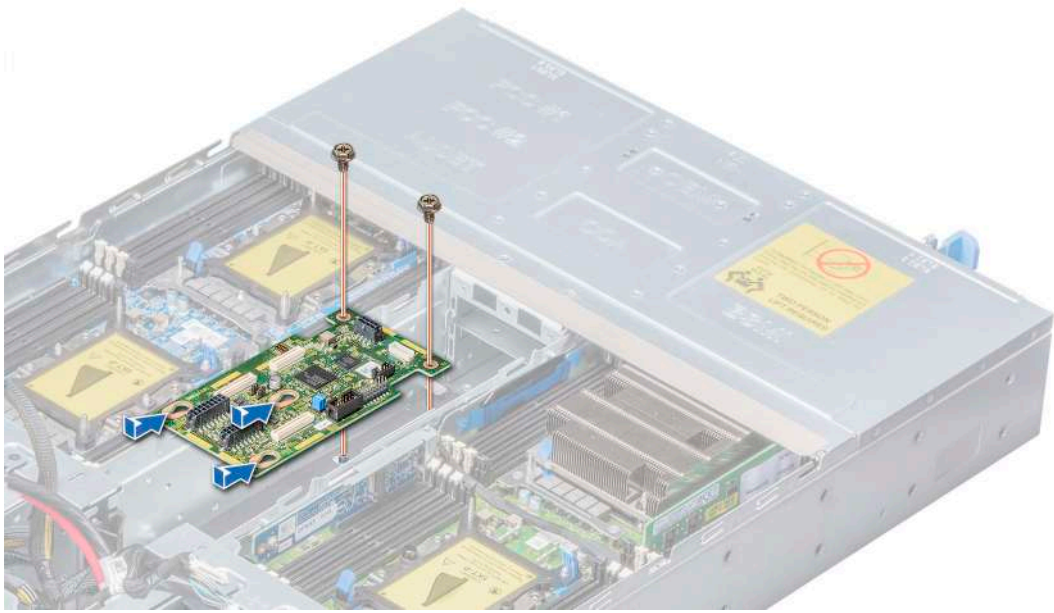


Figure 44. Installing the chassis management board

Next steps

1. Reconnect all the disconnected cables.
2. [Install the power interposer board.](#)
3. [Install the power supply units.](#)
4. Follow the procedure listed in [After working inside your enclosure.](#)

Linking board

Removing the linking board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your enclosure.](#)
3. [Remove all the sleds from the enclosure.](#)
4. [Remove the fan cage.](#)

Steps

1. Using the Phillips #1 screwdriver, remove the screw that secures the linking board to the enclosure.
2. Lift the linking board out of the enclosure.
3. Disconnect all the attached cables.

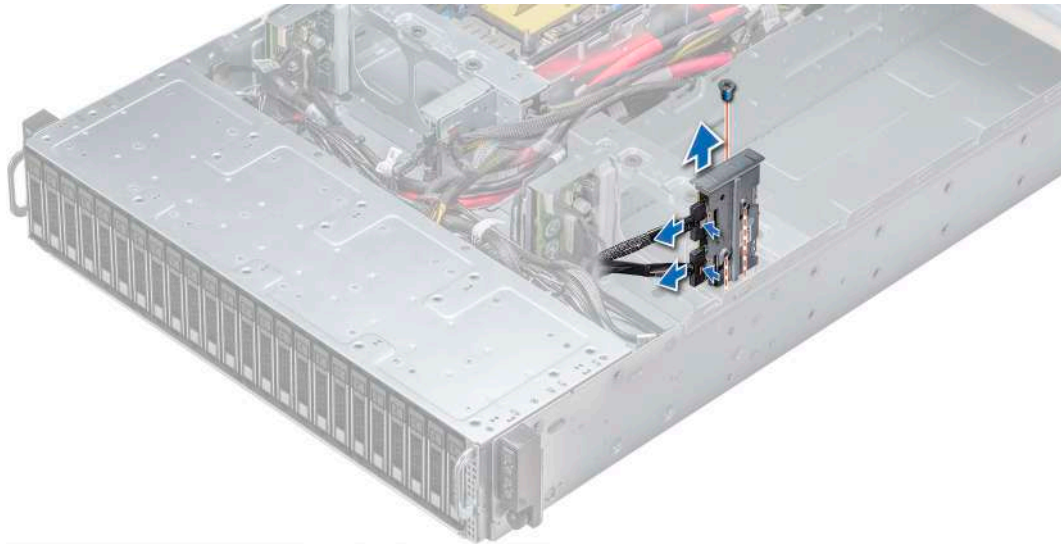


Figure 45. Removing the right linking board

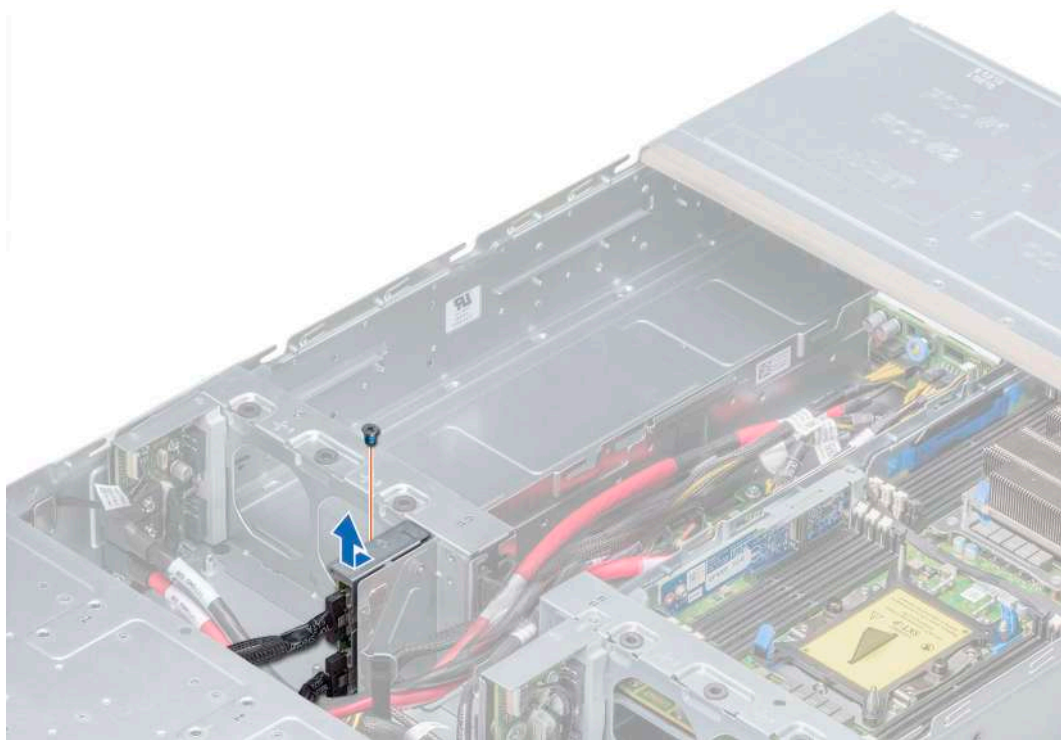


Figure 46. Removing the left linking board

Next steps

1. [Install the linking board.](#)

Installing the linking board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Reconnect all the disconnected cables to the linking board.
2. Align the board with the standoff on the chassis and slide the board into place.
 - NOTE:** Ensure that the linking board cable connector is not folded or twisted while installing the sled, to avoid damaging the linking board cable connector.
3. Using a Phillips #1 screwdriver, replace the screw on the linking board to secure the board in place.

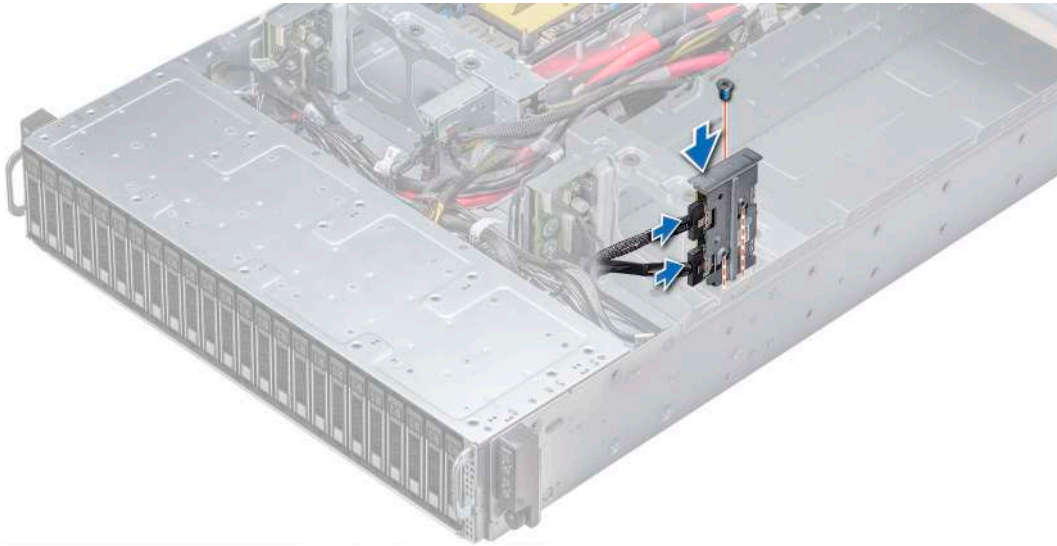


Figure 47. Installing the right linking board

4. Reconnect all the disconnected cables to the left linking board.
5. Align the board with the standoff on the chassis and slide the board into place.
 - NOTE:** Ensure that the linking board cable connector is not folded or twisted while installing the sled, to avoid damaging the linking board cable connector.
6. Using a Phillips #1 screwdriver, replace the screw on the linking board to secure the board in place.

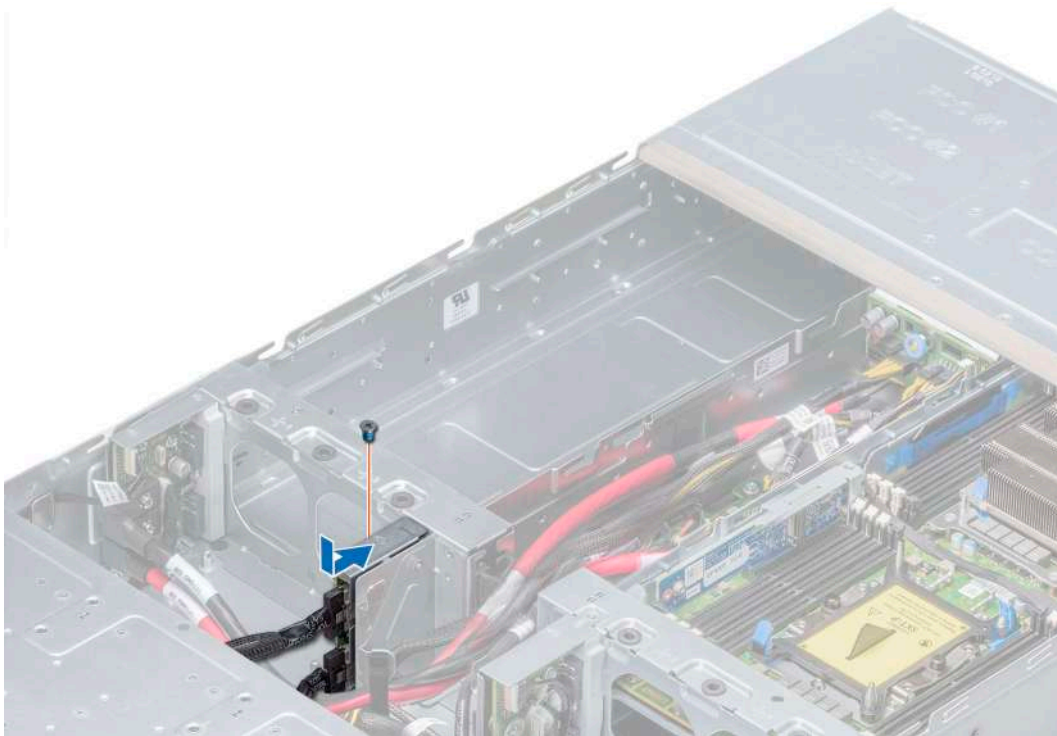


Figure 48. Installing the left linking board

Next steps

1. [Install the fan cage.](#)
2. [Install the sleds into the enclosure.](#)
3. Follow the procedure listed in [After working inside your enclosure.](#)

Cable clip bracket

Removing the cable clip bracket

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your enclosure.](#)
3. [Remove the left linking board.](#)

Steps

1. Using a Phillips 1 screwdriver and hex driver, loosen the two screw nuts that is securing the cable clip bracket.
2. Unclip the cable clip to loosen the cables.
3. Remove the cable clip bracket.

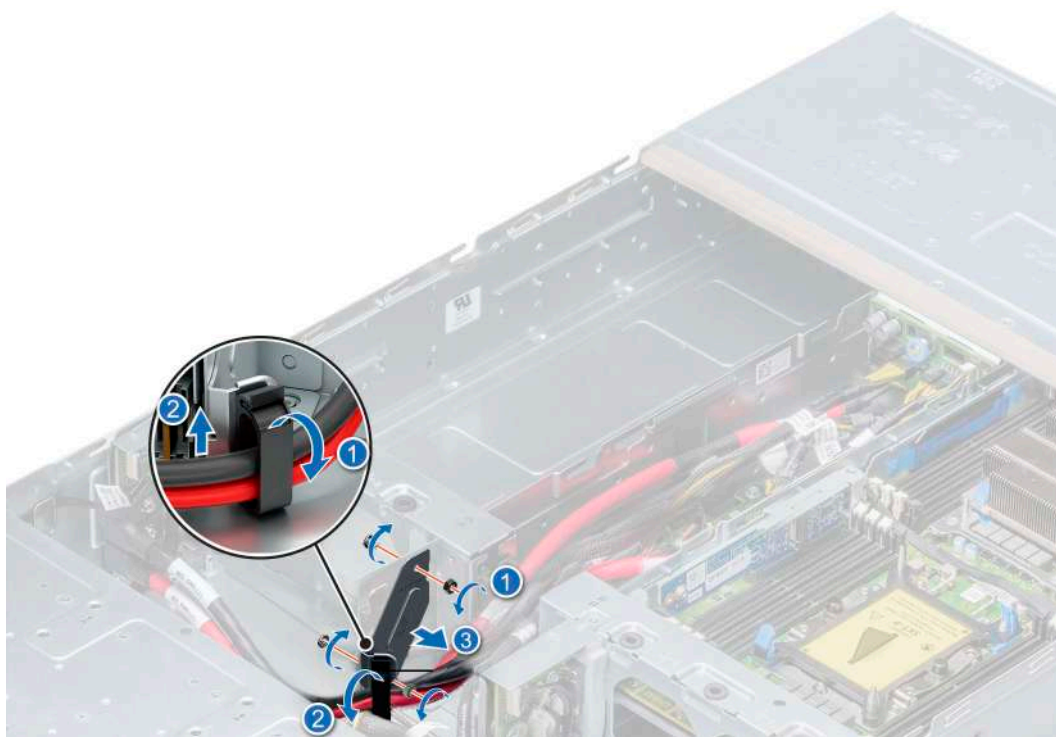


Figure 49. Removing the cable clip bracket

Next steps

1. [Install the left linking board.](#)

Installing the cable clip bracket

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. [Remove the left linking board.](#)

Steps

1. Align the cable clip bracket with the screw holes on the chassis.
2. Using a Phillips 1 screwdriver and hex driver, tighten the two screw nuts to secure the cable clip bracket.
3. Arrange the cables into the bracket and clip to secure the cables in place.

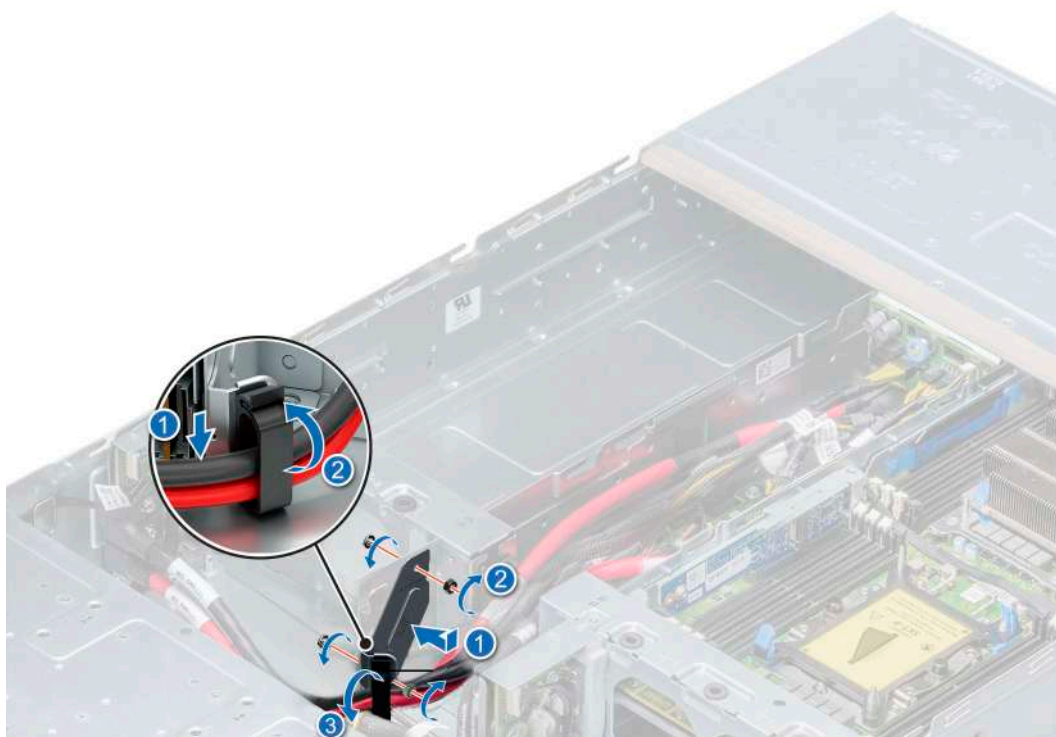


Figure 50. Installing the cable clip bracket

Next steps

1. [Install the left linking board](#)
2. Follow the procedure listed in [After working inside your enclosure](#).

Midplane

Removing the right midplane

Prerequisites

NOTE: Observe the routing of the cables on the chassis as you remove them from the system. Route these cables properly when you replace them to prevent the cables from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [After working inside your enclosure](#).
3. [Remove all the sleds from the enclosure](#).
4. [Remove the cooling fan cage](#).
5. Disconnect all the connected cables.

Steps

1. Using the Phillips #1 screwdriver, remove the screws that secure the midplane to the chassis.
2. Lift the midplane out of the chassis.
3. Using the Phillips #1 screwdriver, remove the screws that secure the power cables to the midplane.

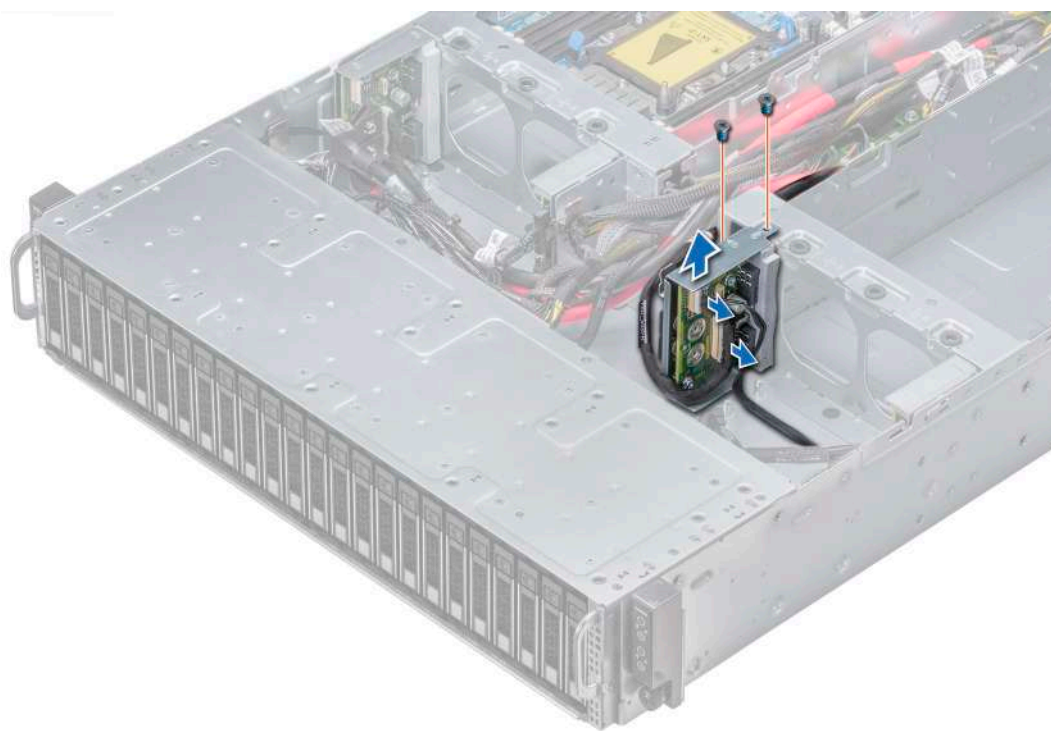


Figure 51. Removing the right midplane

Next steps

1. [Install the right midplane.](#)

Installing the right midplane

Prerequisites

NOTE: You must route the cables properly on the chassis to prevent them from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Using the Phillips #1 screwdriver, connect and secure the power cables to the midplane.
2. Place the midplane into the chassis.
3. Using the Phillips #1 screwdriver, tighten the screws that secure the midplane to the chassis.

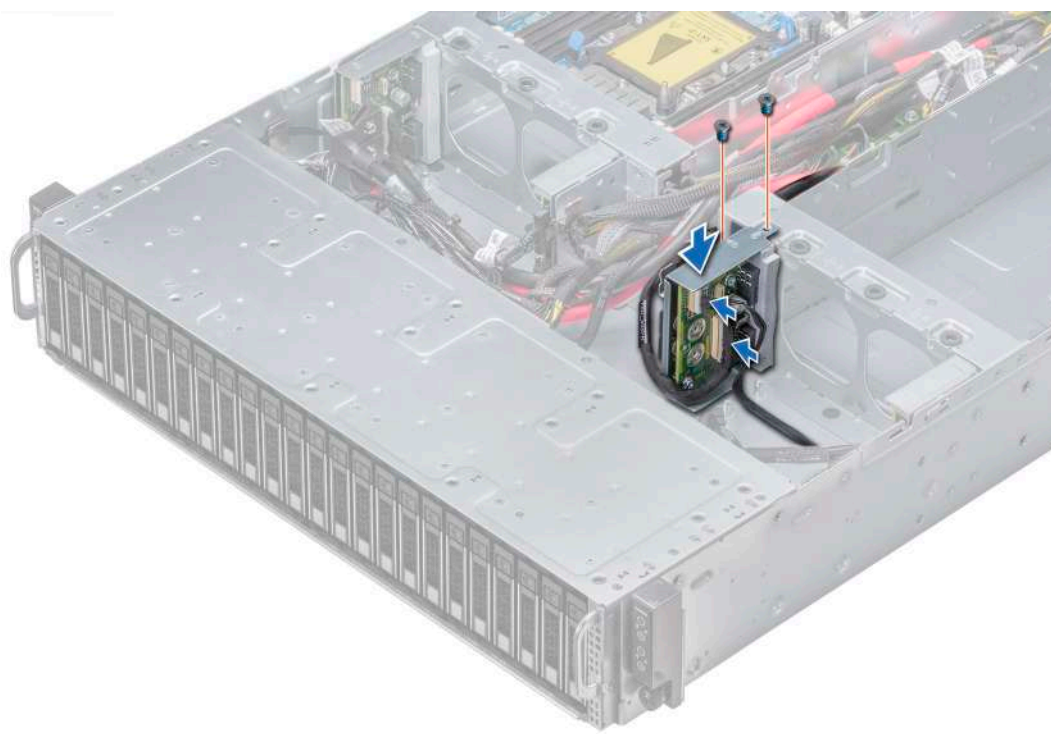


Figure 52. Installing the right midplane

Next steps

1. Reconnect all the disconnected cables.
2. [Install the cooling fan cage.](#)
3. [Install the sleds into the enclosure.](#)
4. Follow the procedure listed in [After working inside your enclosure.](#)

Removing the left midplane

Prerequisites

NOTE: Observe the routing of the cables on the chassis as you remove them from the system. Route these cables properly when you replace them to prevent the cables from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your enclosure.](#)
3. [Remove all the sleds from the enclosure.](#)
4. [Remove the cooling fan cage.](#)
5. Disconnect all the connected cables.

Steps

1. Using the Phillips #1 screwdriver, remove the screws that secure the midplane.
2. Slide and lift the midplane out of the chassis.
3. Using the Phillips #1 screwdriver, remove the screws that secure the power cables to the midplane.

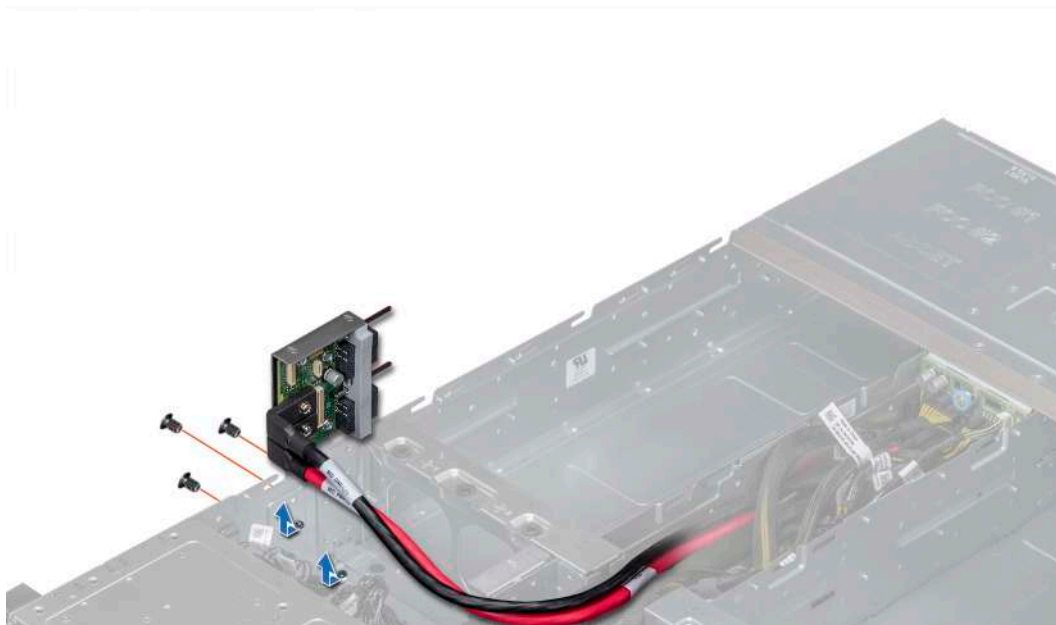


Figure 53. Removing the left midplane

Next steps

1. [Install the midplanes.](#)

Installing the left midplane

Prerequisites

NOTE: You must route the cables properly on the chassis to prevent them from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Using the Phillips #1 screwdriver, connect and secure the power cables to the midplane.
2. Place the midplane into the chassis.
3. Using the Phillips #1 screwdriver, secure the midplane to the chassis with the screws.

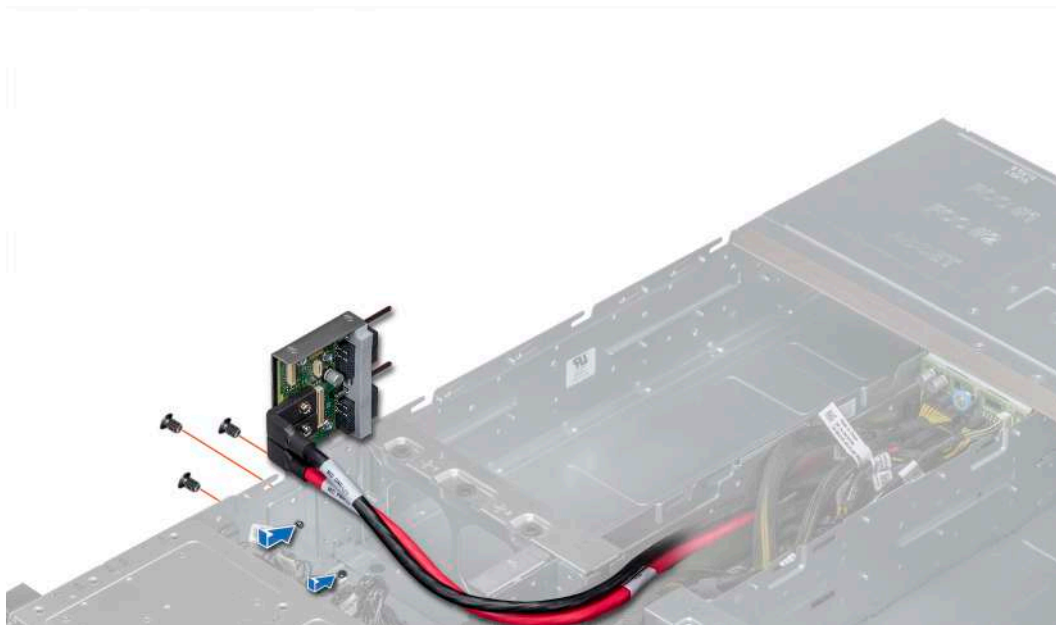


Figure 54. Installing the left midplane

Next steps

1. Connect all the disconnected cables.
2. [Install the cooling fan cage.](#)
3. Follow the procedure listed in [After working inside your enclosure..](#)

Midplane power cable routing

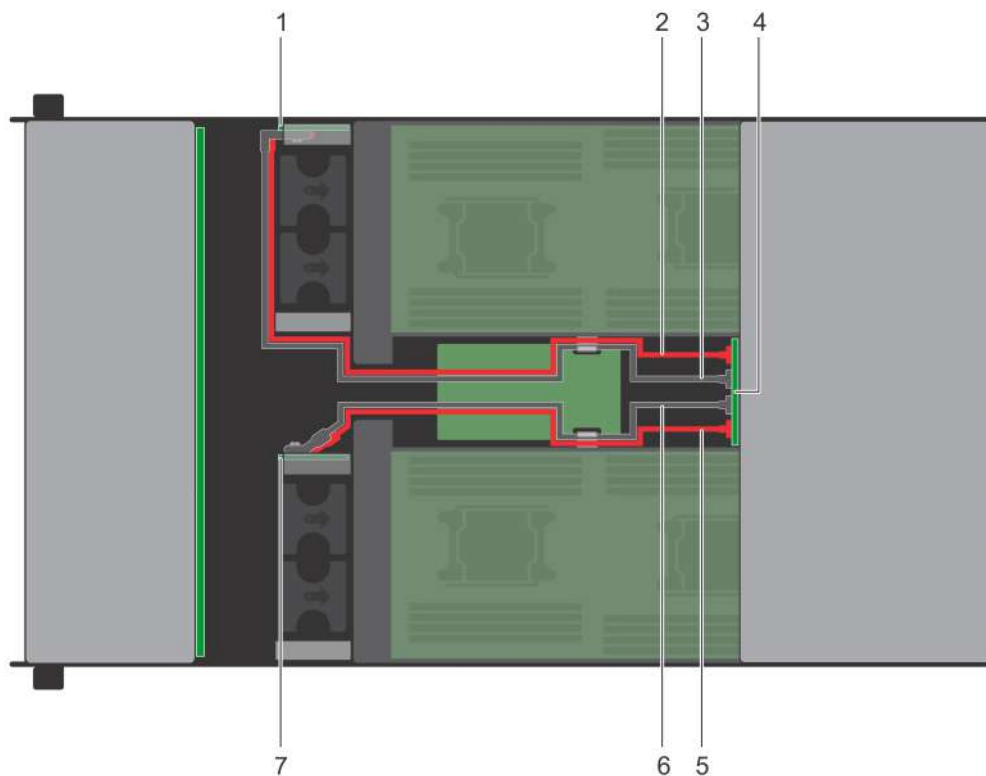


Figure 55. Midplane power cable routing from power interposer board

- | | |
|---|--|
| 1. left midplane | 2. +12 V power cable for left midplane |
| 3. GND cable for left midplane | 4. power interposer board |
| 5. +12 V power cable for right midplane | 6. GND cable for right midplane |
| 7. right midplane | |

Drive cage

Removing the 2.5 inch drive cage

Prerequisites

CAUTION: To prevent damage to the drives and backplane, you must remove the drives from the system before removing the backplane.

CAUTION: You must note the number of each drive and temporarily label them before removal so that you can replace them in the same locations.

NOTE: Observe the routing of the cables on the chassis as you remove them from the system. You must route these cables properly when you replace them to prevent the cables from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your enclosure](#).
3. [Remove the backplane cover](#).
4. [Remove the fan cages](#).
5. If applicable, disconnect the backplane and expander board cables from the linking board and chassis management board.
6. [Remove all the drives](#).

Steps

1. Using the Phillips #1 screwdriver, remove the screws that secure the drive cage to the chassis.
2. Slide the drive cage to the unlock position.
3. Lift the drive cage away from the enclosure.

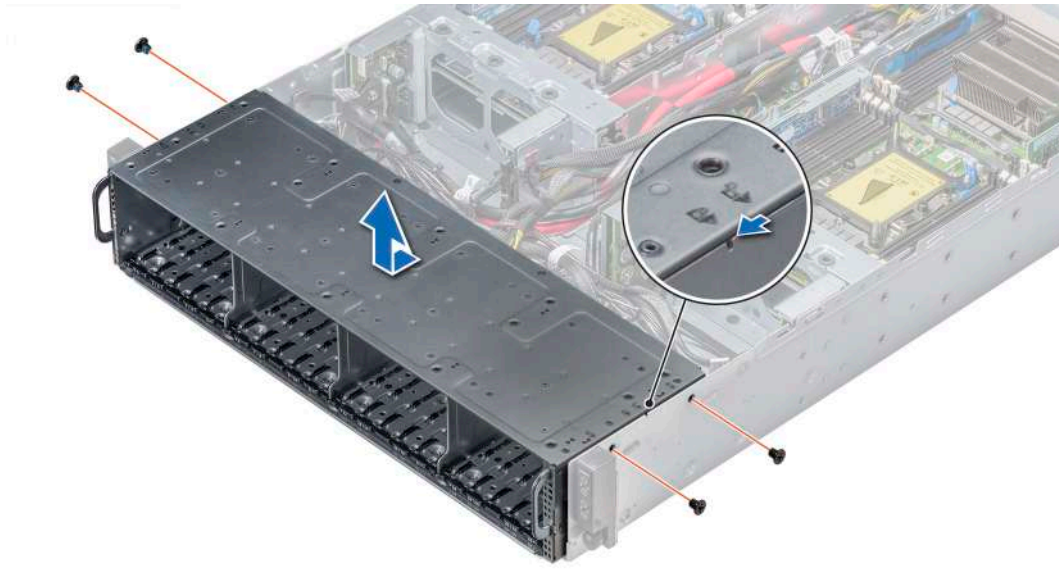


Figure 56. Removing the 2.5-inch drive cage

Next steps

1. [Install the 2.5-inch drive cage.](#)

Installing the 2.5 inch drive cage

Prerequisites

CAUTION: To prevent damage to the drives and backplane, you must remove the drives from the system before removing the backplane.

CAUTION: You must note the number of each drive and temporarily label them before removal so that you can replace them in the same locations.

Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Insert the drive cage into the enclosure, aligning the cage with the standoffs on the chassis.
2. Slide the drive cage toward the lock position.
3. Reconnect all the cables that were disconnected from the backplane.
4. Using the Phillips #1 screwdriver, secure the drive cage in place with screws.

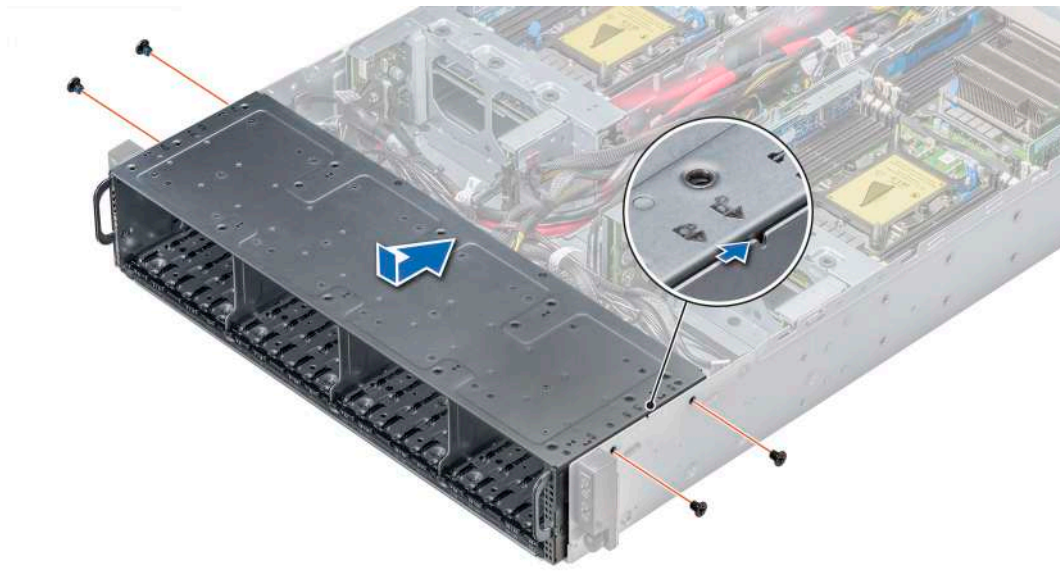


Figure 57. Installing the 2.5-inch drive cage

Next steps

1. If applicable, reconnect all the cables that were disconnected from the linking board and chassis management board.
2. [Install the removed drives.](#)
3. [Install the fan cage.](#)
4. [Install the backplane cover.](#)
5. Follow the procedure listed in [After working inside your enclosure.](#)

Removing the 3.5 inch drive cage

Prerequisites

CAUTION: To prevent damage to the drives and backplane, you must remove the drives from the system before removing the backplane.

CAUTION: You must note the slot number of each drive and temporarily label them before removal so that you can replace them in the same slots.

NOTE: Observe the routing of the cables on the chassis as you remove them from the system. You must route these cables properly when you replace them to prevent the cables from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your enclosure.](#)
3. [Remove the fan cages.](#)
4. Disconnect the backplane cables from the linking board and chassis management board.
5. [Remove all the drives.](#)

Steps

1. Using the Phillips #1 screwdriver, remove the screws that secure the drive cage to the chassis.
2. Slide the drive cage to the unlock position.
3. Hold and lift the drive cage up.
4. Lift the drive cage away from the enclosure.

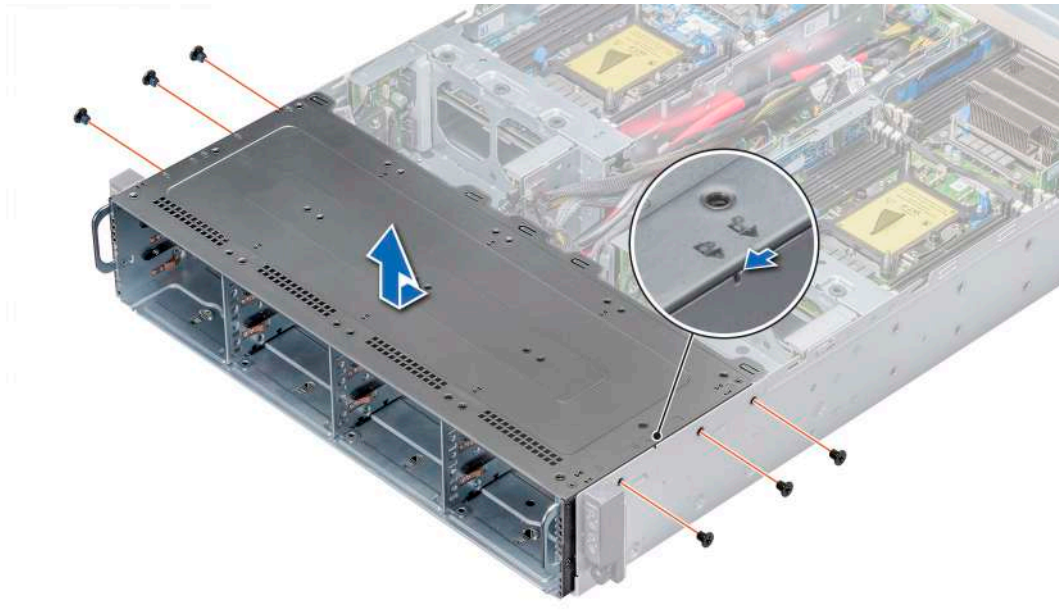


Figure 58. Removing the 3.5-inch drive cage

Next steps

1. [Install the 3.5-inch drive cage.](#)

Installing the 3.5 inch drive cage

Prerequisites

CAUTION: To prevent damage to the drives and backplane, you must remove the drives from the system before removing the backplane.

CAUTION: You must note the number of each drive and temporarily label them before removal so that you can replace them in the same locations.

Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Insert the drive cage into the enclosure, aligning the drive cage with the standoffs on the chassis.
2. Slide the drive cage toward the lock position.
3. Using the Phillips #1 screwdriver, secure the drive cage in place with screws.

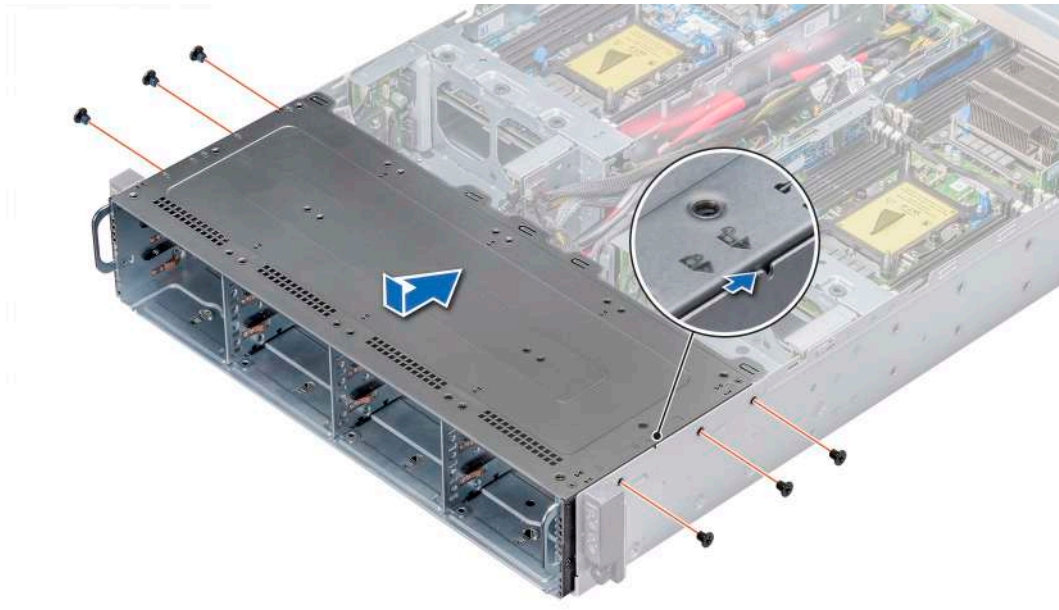


Figure 59. Installing the 3.5-inch drive cage

Next steps

1. Reconnect all the backplane cables that were disconnected from the linking board and chassis management board.
2. [Install all the drives.](#)
3. [Install the fan cages.](#)
4. Follow the procedure listed in [After working inside your enclosure.](#)

Backplanes and expander board

Backplane

The following pages contain information about the backplane and middle plane connectors.

NOTE: SGPIO features will only be available on all passive backplanes at Quarter 4 2017's firmware release.

The image below shows the 12 x 3.5-in hard drive backplane:

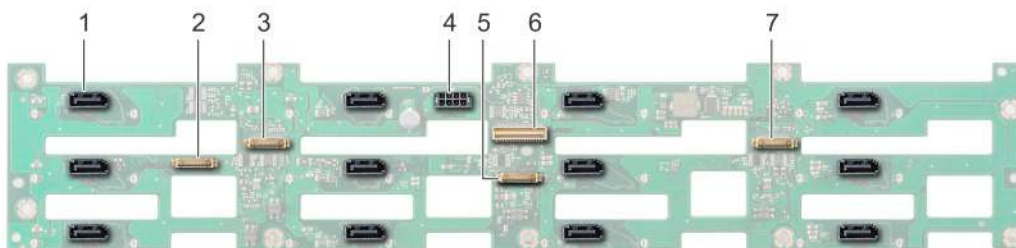


Figure 60. 12 x 3.5-in hard drive backplane

1. SATA/SAS connector (12)
2. Backplane signal cable to sled 4 connector
3. Backplane signal cable to sled 3 connector
4. Backplane power connector
5. Backplane signal cable to sled 2 connector
6. Backplane signal cable connector

7. Backplane signal cable to sled 1 connector

The image below shows the 24 x 2.5-in hard drive backplane:

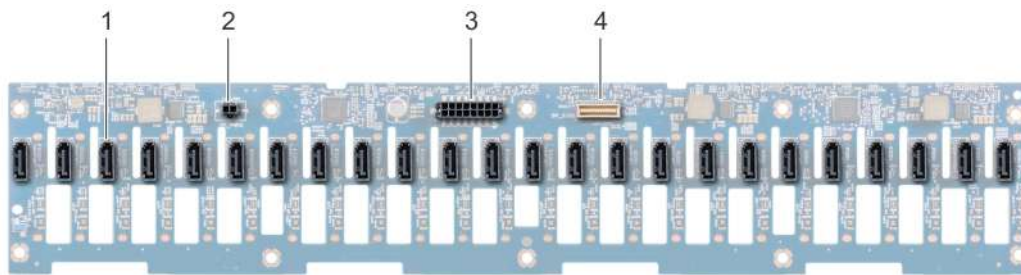


Figure 61. 24 x 2.5-in hard drive backplane

1. SATA connector (24)
2. Expander power connector
3. Backplane power connector
4. Backplane signal connector

The image below shows the 24 x 2.5-in hard drive backplane with NVMe:

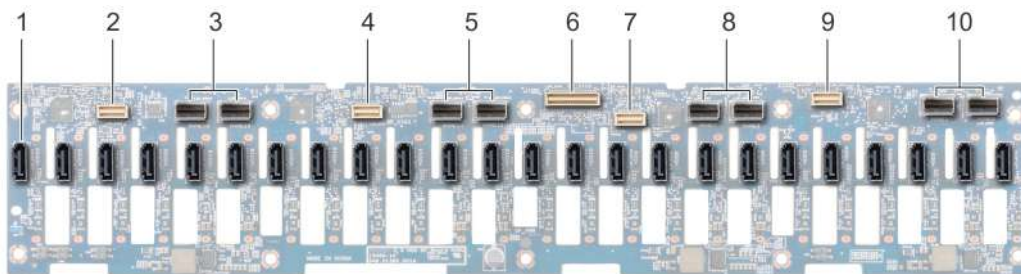


Figure 62. 24 x 2.5-in hard drive backplane with NVMe

1. SATA connector (24)
2. Signal cable to sled 4
3. NVMe ports 19 and 18 connect to sled 4
4. Signal cable to sled 3
5. NVMe ports 13 and 12 connect to sled 3
6. Connector for chassis management board cable
7. Signal cable to sled 2
8. NVMe ports 7 and 6 connect to sled 2
9. Signal cable to sled 1
10. NVMe ports 1 and 0 connect to sled 1

SAS Expander board

The SAS Expander board is necessary to achieve higher, single-volume hard drive configurations. An expander board allows the C6400 to maximize the hard drive space in the hard drive bay. A single expander board supports up to 24 hard drives in the C6400 chassis. The expander board is integrated with the 24 x 2.5-in backplane via MiniSAS hard drive connectors.

The image below shows the SAS Expander board:

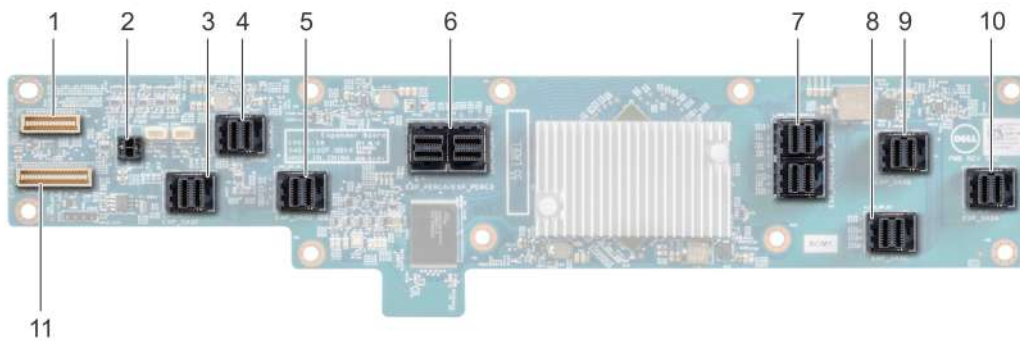


Figure 63. SAS Expander board

1. Expander signal cable connector 2
2. Power connector
3. SAS expander F connector
4. SAS expander E connector
5. SAS expander D connector
6. PERC 3 expander and PERC 4 expander connector
7. PERC 1 expander and PERC 2 expander connector
8. SAS expander C connector
9. SAS expander B connector
10. SAS expander A connector
11. Expander signal cable connector 1

Backplane cable routing

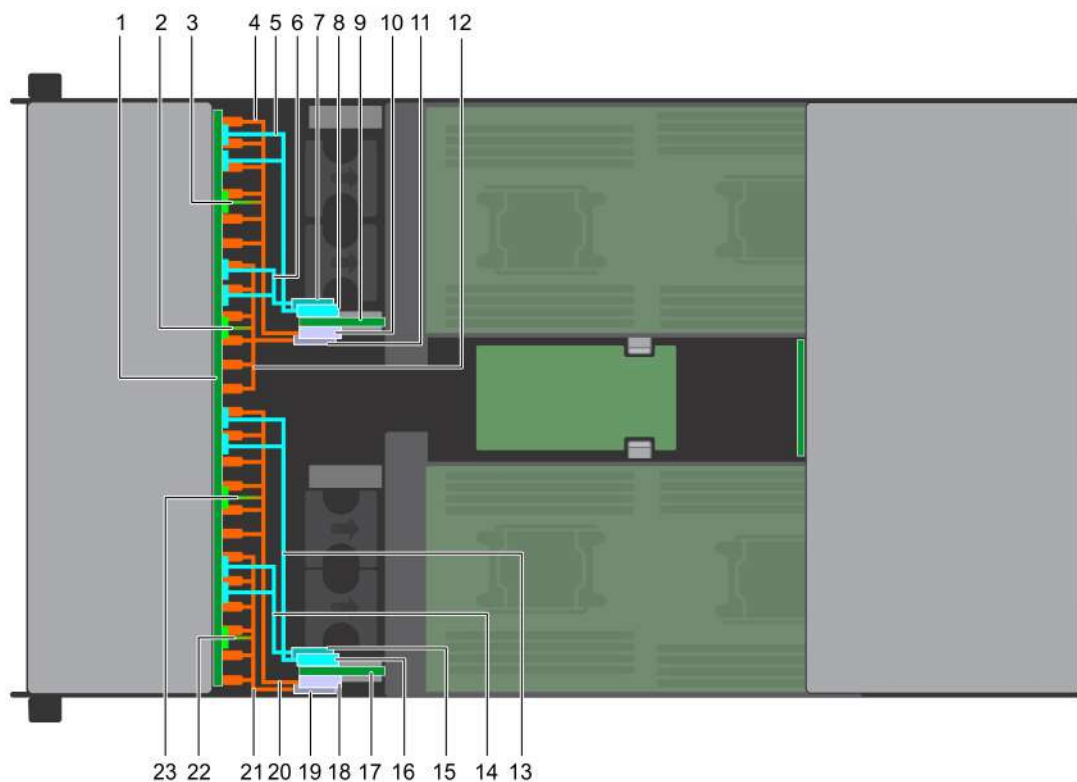


Figure 64. Cabling the 24 x 2.5-inch backplane with NVMe hard drives

1. Backplane
2. Backplane signal cable 1(BP: BPSIG2 to MB: left linking board)

3. Backplane signal cable 2(BP: BPSIG1 to MB: left linking board)
5. NVMe cable for sled 1(BP: BP_NVMe0 sled 1 to MB: left linking board)
7. NVMe connector for sled 2
9. Left linking board
11. Linking board connector for sled 2
13. NVMe cable for sled 3(BP: BP_NVMe12 sled 3 to MB: Right linking board)
15. NVMe connector for sled 4
17. Right linking board
19. Linking board connector for sled 4
21. SATA cable for sled 4(BP: sled 4 to MB: right linking board)
23. Backplane signal cable 4(BP: BPSIG3 to MB: Right linking board)
4. SATA cable for sled 1(BP: sled 1 to MB: left linking board)
6. NVMe cable for sled 2(BP: BP_NVMe6 sled 2 to MB: left linking board)
8. NVMe connector for sled 1
10. Linking board connector for sled 1
12. SATA cable for sled 2(BP: sled 2 to MB: left linking board)
14. NVMe cable for sled 4(BP: BP_NVMe18 sled 4 to MB: right linking board)
16. NVMe connector for sled 3
18. Linking board connector for sled 3
20. SATA cable for sled 3(BP: sled 3 to MB: right linking board)
22. Backplane signal cable 3(BP: BPSIG2 to MB: right linking board)

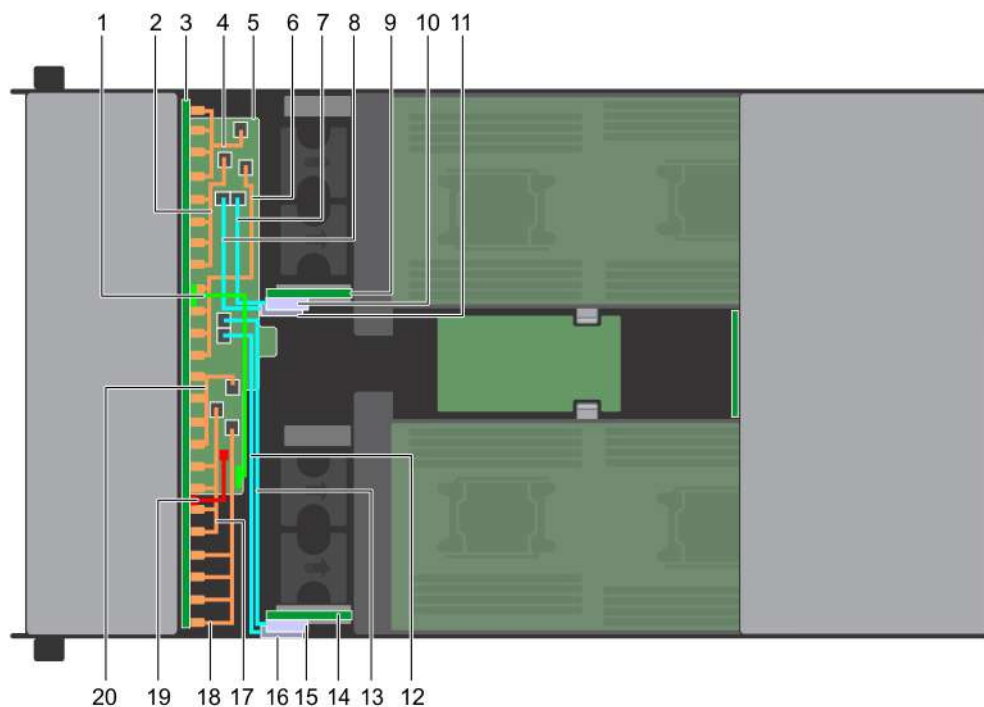


Figure 65. Cabling the 24 x 2.5-inch backplane with expander board

1. Backplane to expander board signal cable
3. Backplane
5. Expander board
7. PERC cable from sled 2(EB: EXP_PERC2 sled 2 to left linking board)
9. Left linking board
11. Linking board connector for sled 2
13. PERC cable from sled 3(EB: EXP_PERC3 sled 3 to right linking board)
15. Linking board connector for sled 3
17. Expander SAS E cable(BP: EXP_SAS E to Expander Board EXP_SAS E)
19. Linking board connector for sled 4
21. Linking board connector for sled 3
23. Linking board connector for sled 2
2. Expander SAS B cable (BP: EXP_SAS B to Expander Board EXP_SAS B)
4. Expander SAS A cable(BP: EXP_SAS A to Expander Board EXP_SAS A)
6. Expander SAS C cable(BP: EXP_SAS C to Expander Board EXP_SAS C)
8. PERC cable from sled 1(EB: EXP_PERC1 sled 1 to left linking board)
10. Linking board connector for sled 1
12. PERC cable from sled 4(EB: EXP_PERC4 sled 3 to right linking board)
14. right linking board
16. Linking board connector for sled 4
18. Expander SAS F cable(BP: EXP_SAS F to Expander Board EXP_SAS F)

19. Backplane to expander board power cable

20. Expander SAS D cable(BP: EXP_SAS D to Expander Board EXP_SAS D)

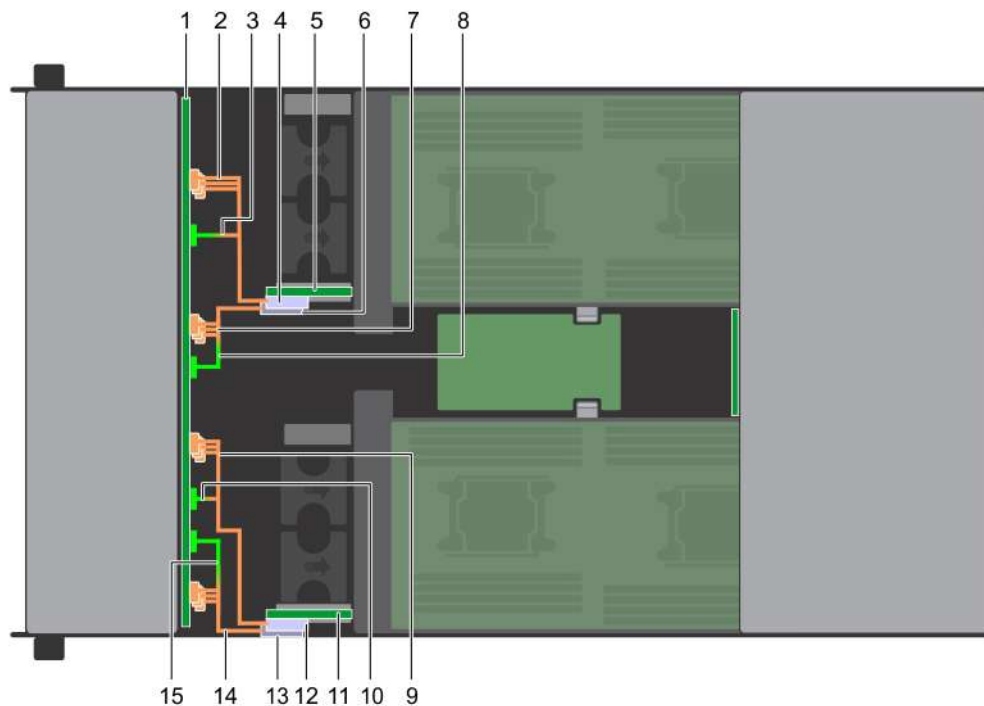


Figure 66. Cabling the 12 x 3.5-inch backplane

- | | |
|--|---|
| 1. Backplane | 2. SATA cable for sled 1(BP: SATA cable sled 1 to left linking board) |
| 3. Signal cable sled 1(BP: BP_SIG1 to left linking board) | 4. Linking board connector for sled 1 |
| 5. Left linking board | 6. Linking board connector for sled 2 |
| 7. SATA cable for sled 2(BP: SATA cable sled 2 to left linking board) | 8. Signal cable sled 2(BP: BP_SIG2 to left linking board) |
| 9. SATA cable for sled 3(BP: SATA cable sled 3 to right linking board) | 10. Signal cable sled 3(BP: BP_SIG3 to left linking board) |
| 11. Right linking board | 12. Linking board connector for sled 3 |
| 13. Linking board connector for sled 4 | 14. SATA cable for sled 4(BP: SATA cable sled 4 to right linking board) |
| 15. Signal cable sled 4(BP: BP_SIG4 to left linking board) | |

Sled to hard drive mapping

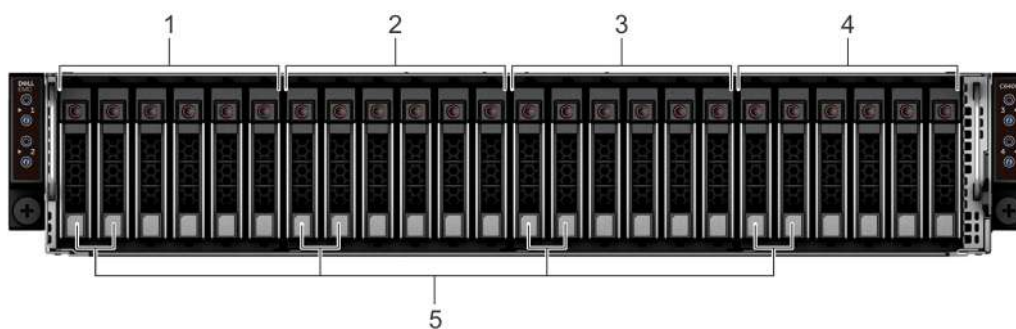


Figure 67. Sled to drive mapping for the enclosure with 24 x 2.5-inch drives

- | | |
|----------------------------------|----------------------------------|
| 1. Drives 0–5 mapped to sled 1 | 2. Drives 6–11 mapped to sled 2 |
| 3. Drives 12–17 mapped to sled 3 | 4. Drives 18–23 mapped to sled 4 |

5. (Optional) NVMe hard drive location

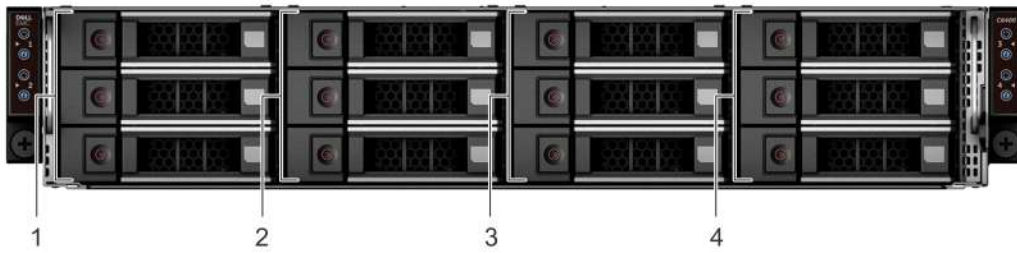


Figure 68. Sled to drive mapping for the enclosure with 12 x 3.5-inch drives

- | | |
|--------------------------------|---------------------------------|
| 1. Drives 0–2 mapped to sled 1 | 2. Drives 3–5 mapped to sled 2 |
| 3. Drives 6–8 mapped to sled 3 | 4. Drives 9–11 mapped to sled 4 |

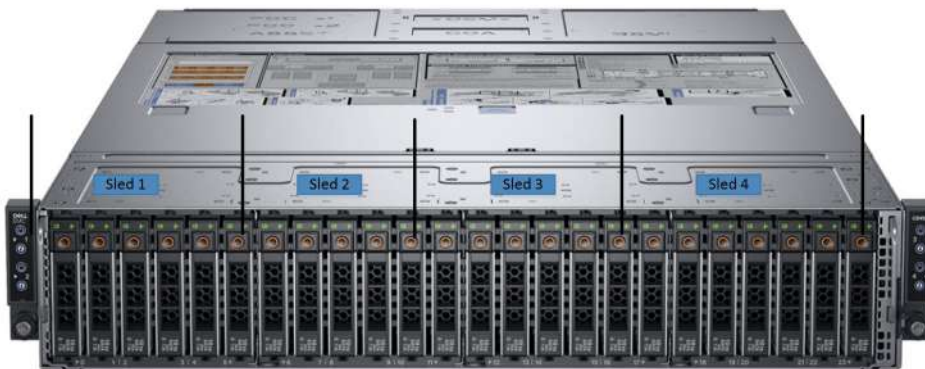
NOTE: The warranty of the drives are linked to the Service Tag of the corresponding sled.

Expander zoning

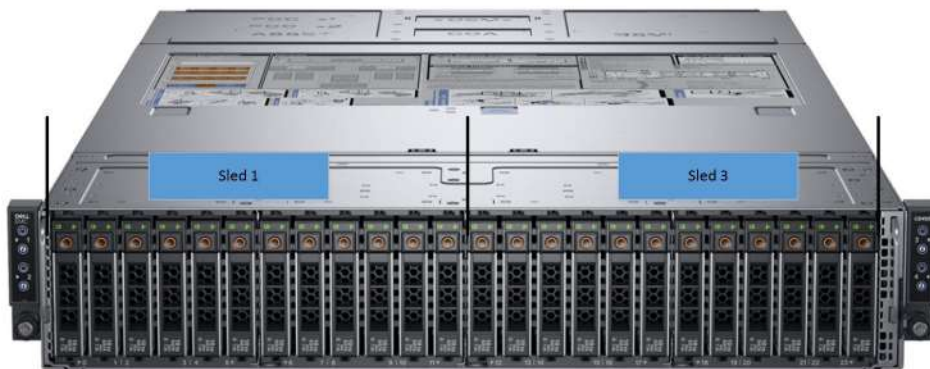
A SAS expander board allows higher, single-volume hard drive configurations. An integrated expander device expands each sleds hard drive footprint.

The PowerEdge 6400 enclosure allows four sleds to access a single expander controller at the same time. there are two zoning options available, they are:

- Up to 6 SAS/SATA device of each sled in Split Mode (6+6+6+6)



- Up to 12 SAS/SATA device of sled 1 and sled 3 in Zoning Mode (12+12)



NOTE:

- Install expander firmware 2.07 (X25-00) or later to support these configurations
- The expander mode works only with a PERC card, and is not supported by the onboard SATA controller.

Removing the backplane

Prerequisites

CAUTION: To prevent damage to the drives and backplane, you must remove the drives from the system before removing the backplane.

CAUTION: You must note the slot number of each drive and temporarily label them before removal so that you can replace them in the same slots.

NOTE: Observe the routing of the cables on the chassis as you remove them from the system. You must route these cables properly when you replace them to prevent the cables from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your enclosure](#).
3. [Remove the drive cage](#).
4. Disconnect all the cables from the backplane.

Steps

1. Orient the drive cage so that the drive bays are facing down.
2. Using the Phillips #2 screwdriver, remove the screws that secure the backplane to the drive cage.
3. Lift the backplane away from the drive cage.

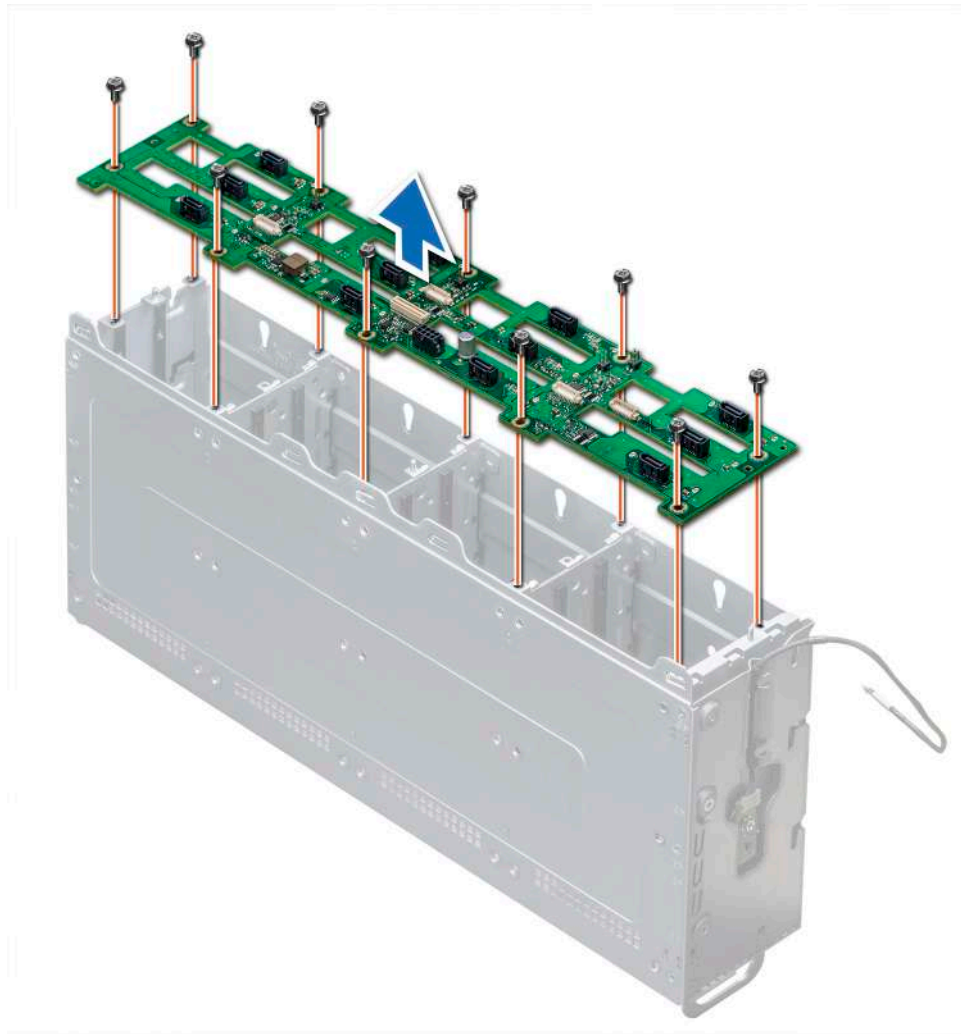


Figure 69. Removing the backplane

Next steps

1. [Install the backplane.](#)

Installing the backplane

Prerequisites

CAUTION: You must note the slot number of each drive and temporarily label them before removal so that you can replace them in the same slots.

NOTE: Observe the routing of the cables on the chassis as you remove them from the system. You must route these cables properly when you replace them to prevent the cables from being pinched or crimped.

Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Orient the drive cage so that the drive bays are facing down.
2. Place the backplane on the drive cage, aligning the screw holes on the backplane with the holes on the drive cage.
3. Using the Phillips #2 screwdriver, replace the screws to secure the backplane to the drive cage.

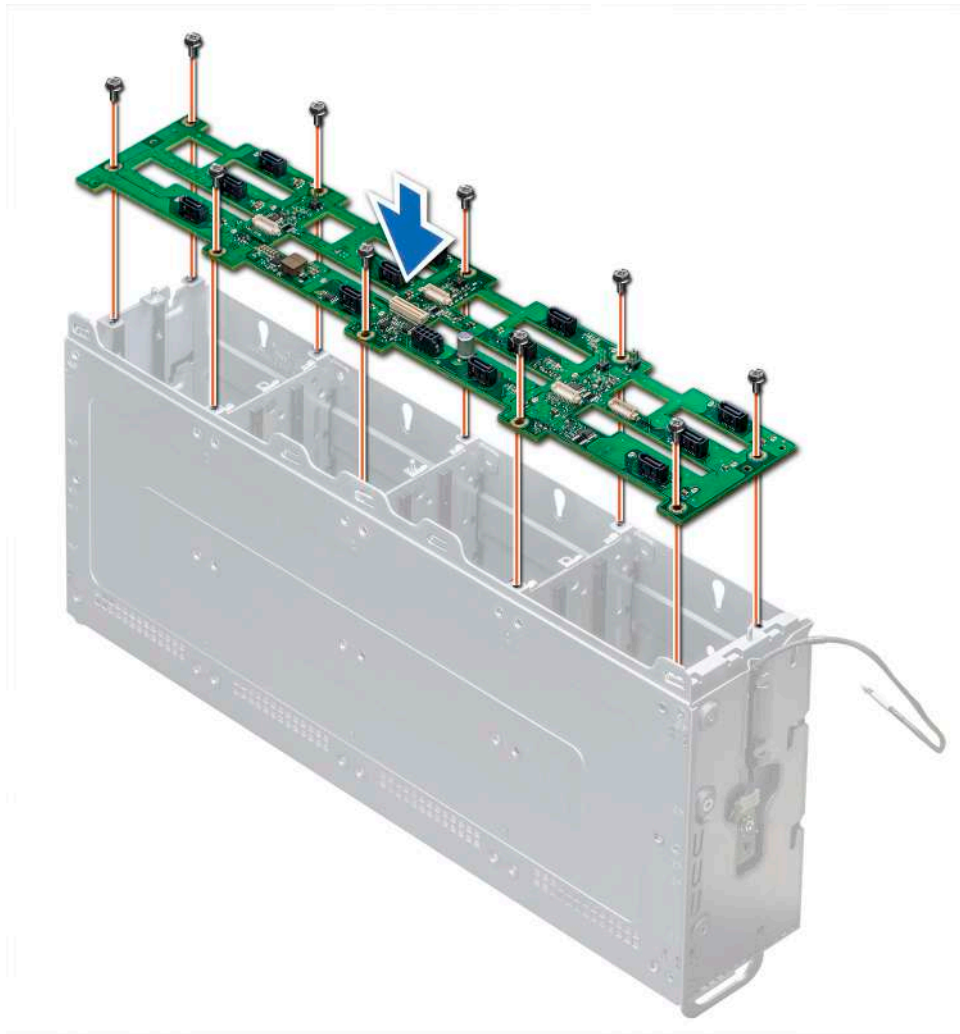


Figure 70. Installing the backplane

Next steps

1. Reconnect all the disconnected cables.
2. [Install the drive cage into the enclosure.](#)
3. Follow the procedure listed in [After working inside your enclosure.](#)

Removing the backplane expander board

Prerequisites

- NOTE:** To prevent damage to the drives and backplane, you must remove the drives from the system before removing the backplane.
 - NOTE:** Observe the routing of the cable on the chassis as you remove them from the system. You must route these cables properly when you replace them to prevent the cables from being pinched or crimped.
 - NOTE:** The backplane expander board is only available with 24 x 2.5-inch drives with NVMe configuration.
1. Follow the safety guidelines listed in [Safety instructions.](#)
 2. Follow the procedure listed in [Before working inside your enclosure.](#)
 3. [Remove the drive cage.](#)
 4. Disconnect all the cables from the backplane expander board.

Steps

1. Using the Phillips #2 screwdriver, remove the screws that secure the backplane expander board to the drive cage.
2. Lift the backplane expander board out of the enclosure.



Figure 71. Removing the backplane expander board

Next steps

1. [Install the backplane expander board.](#)

Installing the backplane expander board

Prerequisites

- NOTE:** Observe the routing of the cable on the chassis as you remove them from the system. You must route these cables properly when you replace them to prevent the cables from being pinched or crimped.
- NOTE:** The backplane expander board is only available with 24 x 2.5-inch drives with NVMe configuration.

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Install the backplane expander board into the enclosure, aligning the screw holes on the board with the holes on the drive cage.
2. Using the Phillips #2 screwdriver, secure the backplane expander board to the chassis.

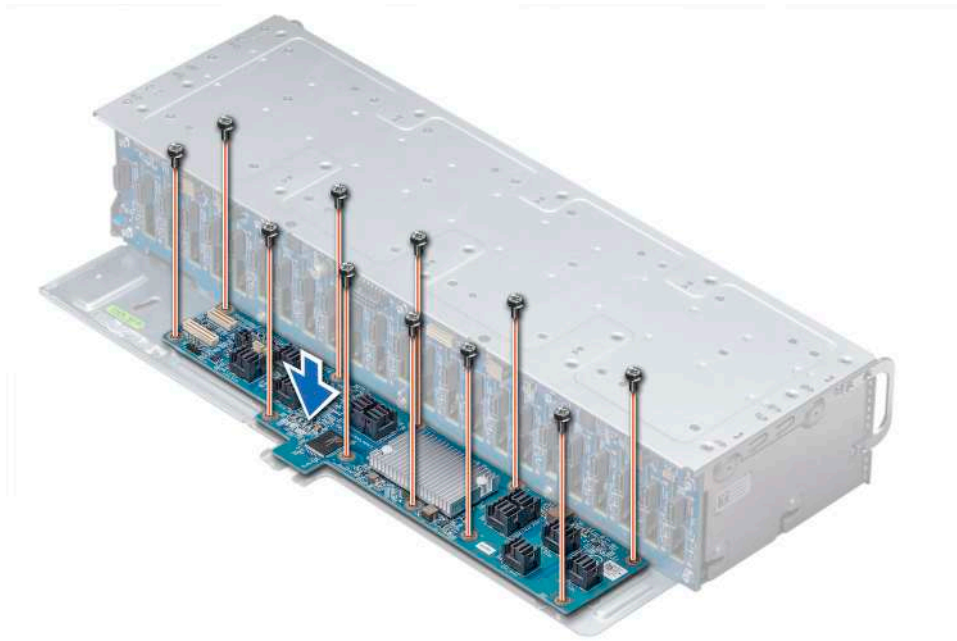


Figure 72. Installing the backplane expander board

Next steps

1. Reconnect all the disconnected cables.
2. [Install the drive cage.](#)
3. Follow the procedure listed in [After working inside your enclosure.](#)

Control panel

Removing the control panel

Prerequisites

NOTE: Observe the routing of the cables on the enclosure as you remove them. You must route these cables properly when you replace them to prevent the cables from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your enclosure.](#)
3. [Remove all the drives.](#)
4. Disconnect all the backplane cables from the linking board and chassis management board.
5. [Remove the drive cage from the enclosure.](#)
6. Disconnect control panel cables from the midplane.

Steps

1. Using the Phillips #1 screwdriver, remove the screws that secure the control panel assembly to the enclosure.
2. Remove the cable from the cable retention clips.
3. Lift the control panel assembly away.

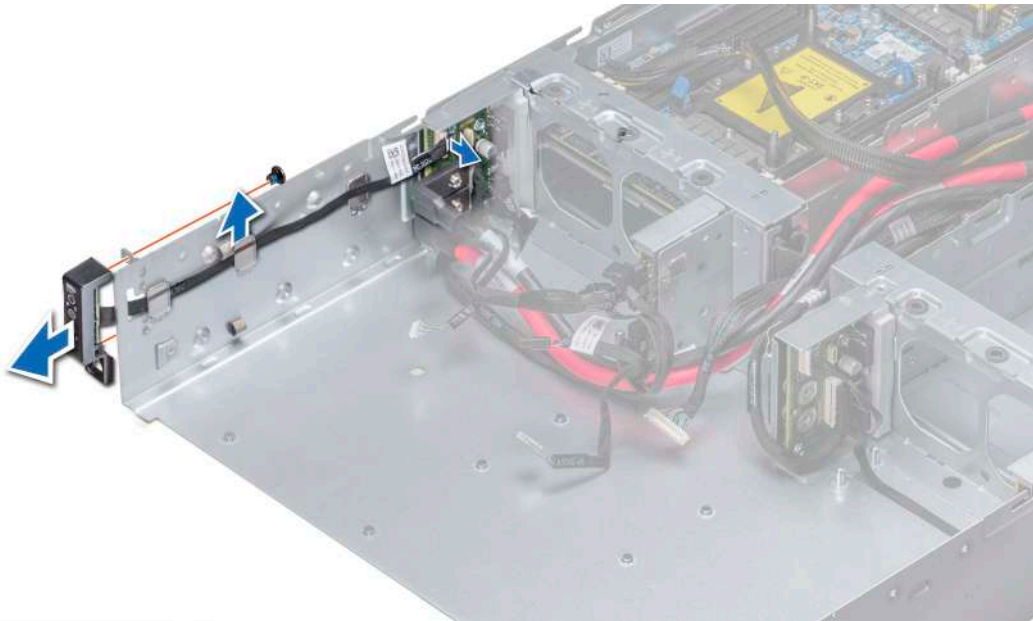


Figure 73. Removing the left control panel assembly

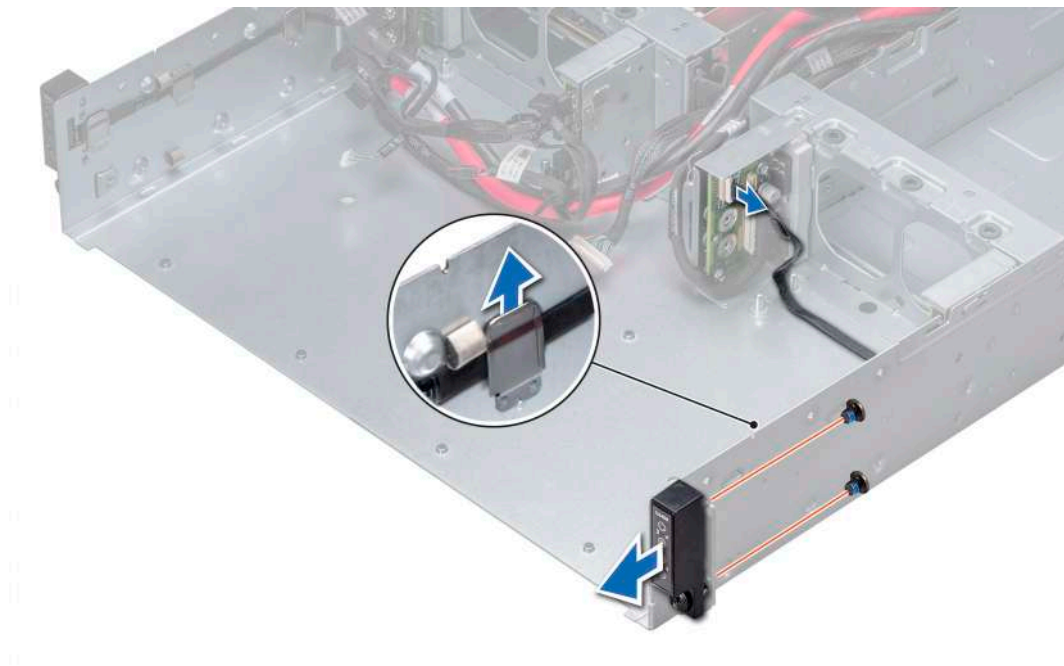


Figure 74. Removing the right control panel assembly

Next steps

1. Install the control panel assembly.

Installing the control panel

Prerequisites

- NOTE:** Observe the routing of the cables on the chassis as you remove them from the system. You must route these cables properly when you replace them to prevent the cables from being pinched or crimped.

NOTE: Additional tape maybe required to secure the cables.

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Route the control panel cable through the cable retention clips.
2. Install the control panel assembly and secure it in place with screws.

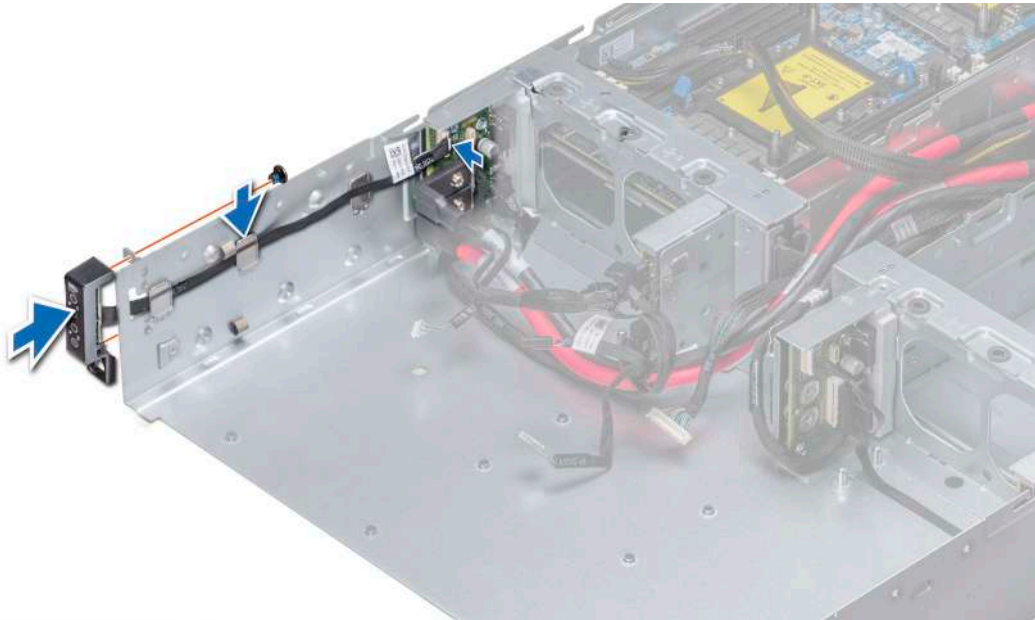


Figure 75. Installing the left control panel

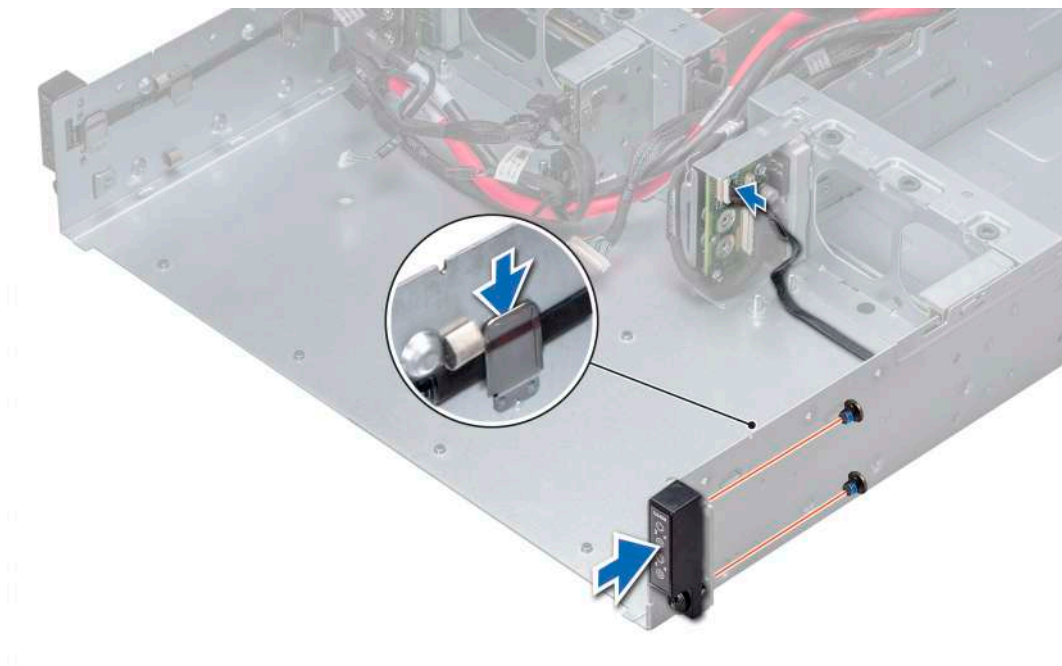


Figure 76. Installing the right control panel

Next steps

1. Reconnect the control panel cable to the midplane.
2. [Install the drive cage into the enclosure.](#)

3. Reconnect all the disconnected backplane cables.
4. [Install all the removed drives.](#)
5. Follow the procedure listed in [After working inside your enclosure.](#)

Thermal sensor board

Removing the thermal sensor board

Prerequisites

CAUTION: To prevent damage to the drives and backplane, you must remove the drives from the system before removing the backplane.

CAUTION: You must note the number of each drive and temporarily label them before removal so that you can replace them in the same locations.

NOTE: Observe the routing of the cables on the chassis as you remove them from the system. You must route these cables properly when you replace them to prevent the cables from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your enclosure.](#)
3. [Remove all the drives.](#)
4. Disconnect all the cables from the backplane.
5. Disconnect the control panel cable from the midplane.
6. [Remove the drive cage from the chassis.](#)

Steps

1. Using the Phillips #1 screwdriver, remove the screw that secures the thermal sensor board assembly to the drive cage.
2. Disconnect the cable from the sensor board assembly.
3. Remove the screw that secures the sensor board to the drive cage, and lift the board away.



Figure 77. Removing the sensor board

Next steps

1. [Install the sensor board.](#)

Installing the thermal sensor board

Prerequisites

NOTE: Observe the routing of the cables on the chassis as you remove them from the system. You must route these cables properly on the chassis to prevent them from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Install the thermal sensor board into the sensor board holder, and using the Phillips #1 screwdriver, secure it to the holder.
2. Connect the cable to the sensor board assembly.
3. Install the sensor board assembly into the drive cage.
4. Replace the screw that secures the sensor board assembly to the drive cage.



Figure 78. Installing the sensor board assembly

Next steps

1. [Replace the drive cage into the chassis.](#)
2. Connect all the cables to the backplane.
3. Connect the control panel cables to the midplane.
4. [Install the drives.](#)
5. Follow the procedure listed in [After working inside your enclosure.](#)

Getting help

Topics:

- [Contacting Dell](#)
- [Documentation feedback](#)
- [Accessing system information by using QRL](#)
- [Receiving automated support with SupportAssist](#)
- [Recycling or End-of-Life service information](#)

Contacting Dell

Dell provides several online and telephone based support and service options. If you do not have an active internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical assistance, or customer service issues:

Steps

1. Go to www.dell.com/support/home.
2. Select your country from the drop-down menu on the lower right corner of the page.
3. For customized support:
 - a. Enter your system Service Tag in the **Enter your Service Tag** field.
 - b. Click **Submit**.
The support page that lists the various support categories is displayed.
4. For general support:
 - a. Select your product category.
 - b. Select your product segment.
 - c. Select your product.
The support page that lists the various support categories is displayed.
5. For contact details of Dell Global Technical Support:
 - a. Click [Contact Technical Support](#).
 - b. Enter your system Service Tag in the **Enter your Service Tag** field on the Contact Us webpage.

Documentation feedback

You can rate the documentation or write your feedback on any of our Dell documentation pages and click **Send Feedback** to send your feedback.

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the information tag in the front of the system, to access the information about the PowerEdge system.

Prerequisites

Ensure that your smartphone or tablet has the QR code scanner installed.

The QRL includes the following information about your system:

- How-to videos

- Reference materials, including the Installation and Service Manual, and mechanical overview
- Your system service tag to quickly access your specific hardware configuration and warranty information
- A direct link to Dell to contact technical assistance and sales teams

Steps

1. Go to www.dell.com/qrl and navigate to your specific product or
2. Use your smartphone or tablet to scan the model-specific Quick Resource (QR) code on your system or in the Quick Resource Locator section.

Quick Resource Locator for C6400 and C6420 systems



Figure 79. Quick Resource Locator for PowerEdge C6400 and C6420 systems

Receiving automated support with SupportAssist

Dell EMC SupportAssist is an optional Dell EMC Services offering that automates technical support for your Dell EMC server, storage, and networking devices. By installing and setting up a SupportAssist application in your IT environment, you can receive the following benefits:

- **Automated issue detection** — SupportAssist monitors your Dell EMC devices and automatically detects hardware issues, both proactively and predictively.
- **Automated case creation** — When an issue is detected, SupportAssist automatically opens a support case with Dell EMC Technical Support.
- **Automated diagnostic collection** — SupportAssist automatically collects system state information from your devices and uploads it securely to Dell EMC. This information is used by Dell EMC Technical Support to troubleshoot the issue.
- **Proactive contact** — A Dell EMC Technical Support agent contacts you about the support case and helps you resolve the issue.

The available benefits vary depending on the Dell EMC Service entitlement purchased for your device. For more information about SupportAssist, go to www.dell.com/supportassist.

Recycling or End-of-Life service information

Take back and recycling services are offered for this product in certain countries. If you want to dispose of system components, visit www.dell.com/recyclingworldwide and select the relevant country.

Documentation resources

This section provides information about the documentation resources for your system.

To view the document that is listed in the documentation resources table:


- From the Dell Technologies support site:
 1. Click the documentation link that is provided in the Location column in the table.
 2. Click the required product or product version.
-  **NOTE:** To locate the product name and model, see the front of your system.
- 3. On the Product Support page, click **Manuals & documents**.
- Using search engines:
 - Type the name and version of the document in the search box.

Table 5. Documentation resources

Task	Document	Location
Setting up your system	<p>For more information about installing and securing the system into a rack, see the Rail Installation Guide included with your rack solution.</p> <p>For information about setting up your system, see the <i>Getting Started Guide</i> document that is shipped with your system.</p>	poweredge manuals
Configuring your system	<p>For information about the iDRAC features, configuring and logging in to iDRAC, and managing your system remotely, see the Integrated Dell Remote Access Controller User's Guide.</p> <p>For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM CLI Guide for iDRAC.</p> <p>For information about Redfish and its protocol, supported schema, and Redfish Eventing implemented in iDRAC, see the Redfish API Guide.</p> <p>For information about iDRAC property database group and object descriptions, see the Attribute Registry Guide.</p> <p>For information about Intel QuickAssist Technology, see the Integrated Dell Remote Access Controller User's Guide.</p>	poweredge manuals
	<p>For information about earlier versions of the iDRAC documents.</p> <p>To identify the version of iDRAC available on your system, on the iDRAC web interface, click ? > About.</p>	idracmanuals

Table 5. Documentation resources (continued)

Task	Document	Location	
	For information about installing the operating system, see the operating system documentation.	https://www.dell.com/operatingsystemmanuals	poweredge manuals
	Managing your system	For information about system management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	
For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.		www.dell.com/openmanagemanuals > OpenManage Server Administrator	
For information about installing, using, and troubleshooting Dell OpenManage Enterprise, see the Dell OpenManage Enterprise User's Guide.		openmanage manuals	
For information about installing and using Dell SupportAssist, see the Dell EMC SupportAssist Enterprise User's Guide.		https://www.dell.com/serviceabilitytools	
For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.		openmanage manuals	
Working with the Dell PowerEdge RAID controllers	For information about understanding the features of the Dell PowerEdge RAID controllers (PERC), Software RAID controllers, or BOSS card and deploying the cards, see the Storage controller documentation.	www.dell.com/storagecontrollermanuals	
Understanding event and error messages	For information about the event and error messages generated by the system firmware and agents that monitor system components, go to qrl.dell.com > Look Up > Error Code , type the error code, and then click Look it up .	www.dell.com/qrl	

Table 5. Documentation resources (continued)

Task	Document	Location
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	poweredge manuals