Dell EMC PowerEdge R740xd2

Installation and Service Manual

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Regulatory Type: E56S001
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DELL Technologies

Notes, cautions, and warnings

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

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

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

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1

About this document

This document provides an overview about the system, information about installing and replacing components, technical specifications, diagnostic tools, and guidelines to be followed while installing certain components.

2

Dell Technologies PowerEdge R740xd2 system overview

The Dell Technologies PowerEdge R740xd2 system is a 2U rack server that supports up to:

- Two 2nd generation Intel Xeon Scalable Processor
- 16 DIMM slots
- Two redundant power supply units
- 26 SAS, SATA, Nearline SAS hard drives or SSDs

  For more information, see Drive Specifications in the PowerEdge R740xd2 Technical Specs at www.dell.com/support/manuals.

NOTE: All instances of SAS, SATA hard drives, and SSDs are referred to as drives in this document, unless specified otherwise.

For more information, see the Dell EMC PowerEdge R740xd2 Technical Specifications on the product documentation page.

Topics:

- Front view of the system
- Rear view of the system
- Inside the system
- Locating the information tag of your system
- System Information Label

Front view of the system

Figure 1. Front view of 24 x 3.5-inch drive system

1. Left control panel
2. Drives (12)
3. Right control panel
4. Right release latch
5. Left release latch

For more information, see the Dell EMC PowerEdge R740xd2 on the product documentation page.

Control panels

Left control panel

Figure 2. Left control panel view

1. System health and system ID indicator
2. Drive indicator

Right control panel

Figure 3. Right control panel view

1. Power button
2. USB 2.0-compliant port
3. Micro USB 2.0-compliant port for iDRAC Direct
4. iDRAC LED indicator

NOTE: For more information on the ports, see the ports and connectors specifications in the PowerEdge R740xd2 Technical Specs at https://www.dell.com/support/manuals/.

Rear view of the system

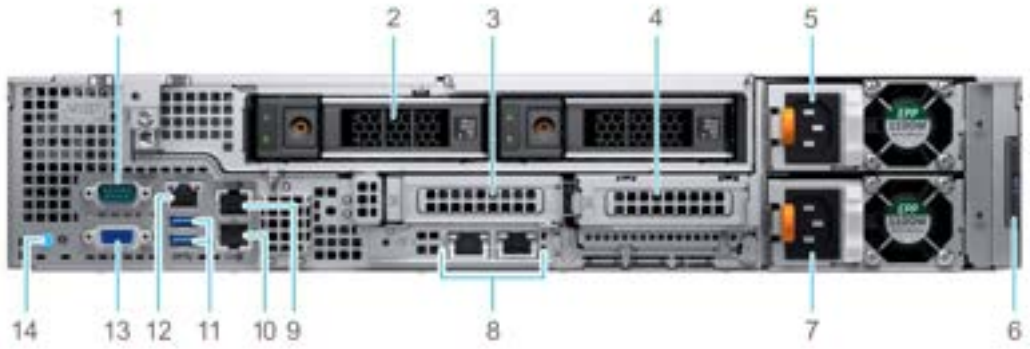

Figure 4. Back panel features of 2 x 3.5-inch (rear) drive system with low-profile risers

1. Serial port
2. Drives (2)
3. Low-profile riser 1 (slot 2)
4. Low-profile riser 2 (slot 3)
5. Power supply unit (PSU 1)
6. Information tag
7. Power supply unit (PSU 2)
8. LOM ethernet port (2)
9. Ethernet port (Gb1)
10. Ethernet port (Gb2)
11. USB 3.0 port (2)
12. iDRAC9 dedicated network port
13. VGA port
14. System identification button

Figure 5. Back panel features of 2 x 3.5-inch (rear) drive system with full-height riser

1. Serial port
2. Drive (2)
3. Full-height riser slot (slot 2)
4. Power supply unit (PSU 1)
5. Information tag
6. Power supply unit (PSU 2)
7. LOM ethernet port (2)
8. Ethernet port (Gb1)
9. Ethernet port (Gb2)
10. USB 3.0 port (2)
11. iDRAC9 dedicated network port
12. VGA port
13. System identification button

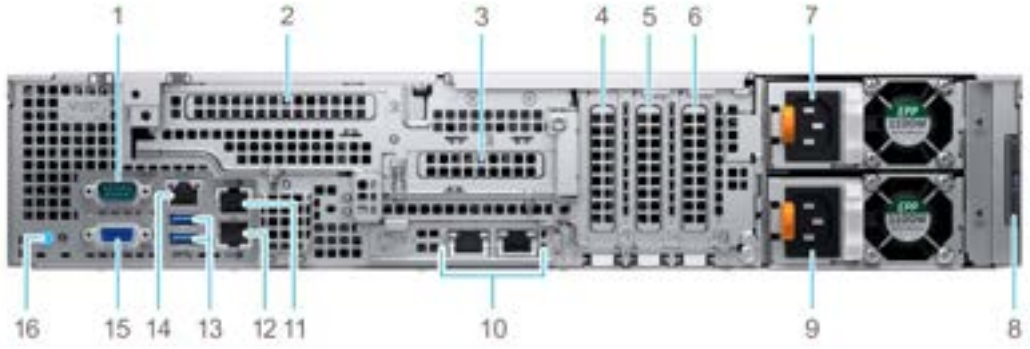

Figure 6. Back panel features of system with butterfly riser

1. Serial port
2. Butterfly riser full-height (slot 2)
3. Butterfly riser low-profile (slot 3)
4. Low-profile PCIe expansion card (slot 4)
5. Low-profile PCIe expansion card (slot 5)
6. Low-profile PCIe expansion card (slot 6)
7. Power supply unit (PSU 1)
8. Information tag
9. Power supply unit (PSU 2)
10. LOM ethernet port (2)
11. Ethernet port (Gb1)
12. Ethernet port (Gb2)
13. USB 3.0 port (2)
14. iDRAC9 dedicated network port
15. VGA port
16. System identification button

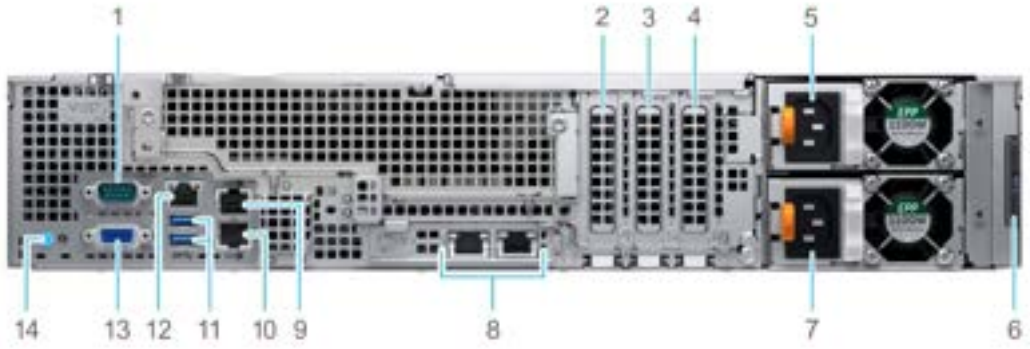

Figure 7. Back panel features of system without risers

1. Serial port
2. Low-profile PCIe expansion card (slot 4)
3. Low-profile PCIe expansion card (slot 5)
4. Low-profile PCIe expansion card (slot 6)
5. Power supply unit (PSU 1)
6. Information tag
7. Power supply unit (PSU 2)
8. LOM ethernet port (2)
9. Ethernet port (Gb1)
10. Ethernet port (Gb2)
11. USB 3.0 port (2)
12. iDRAC9 dedicated network port
13. VGA port
14. System identification button

For more information, see the Dell EMC PowerEdge R740xd2 on the product documentation page.

Inside the system

NOTE: Components that are hot swappable are marked orange and touch points on the components are marked blue.

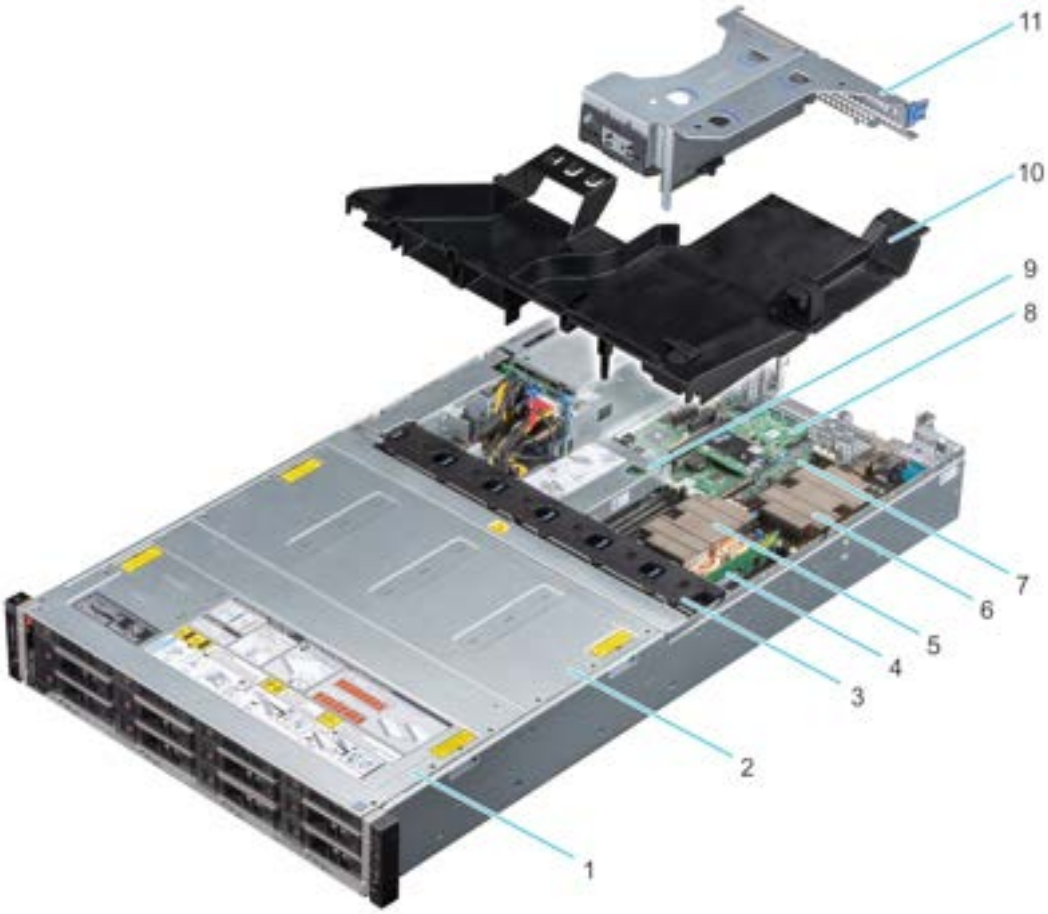

Figure 8. Inside the system with butterfly riser

1. Drive bay 1
2. Drive bay 2
3. Fans (6)
4. Memory module
5. Processor and heatsink module 1
6. Processor and heatsink module 2
7. System board
8. LOM riser card
9. Internal PERC riser
10. Air shroud
11. Butterfly riser

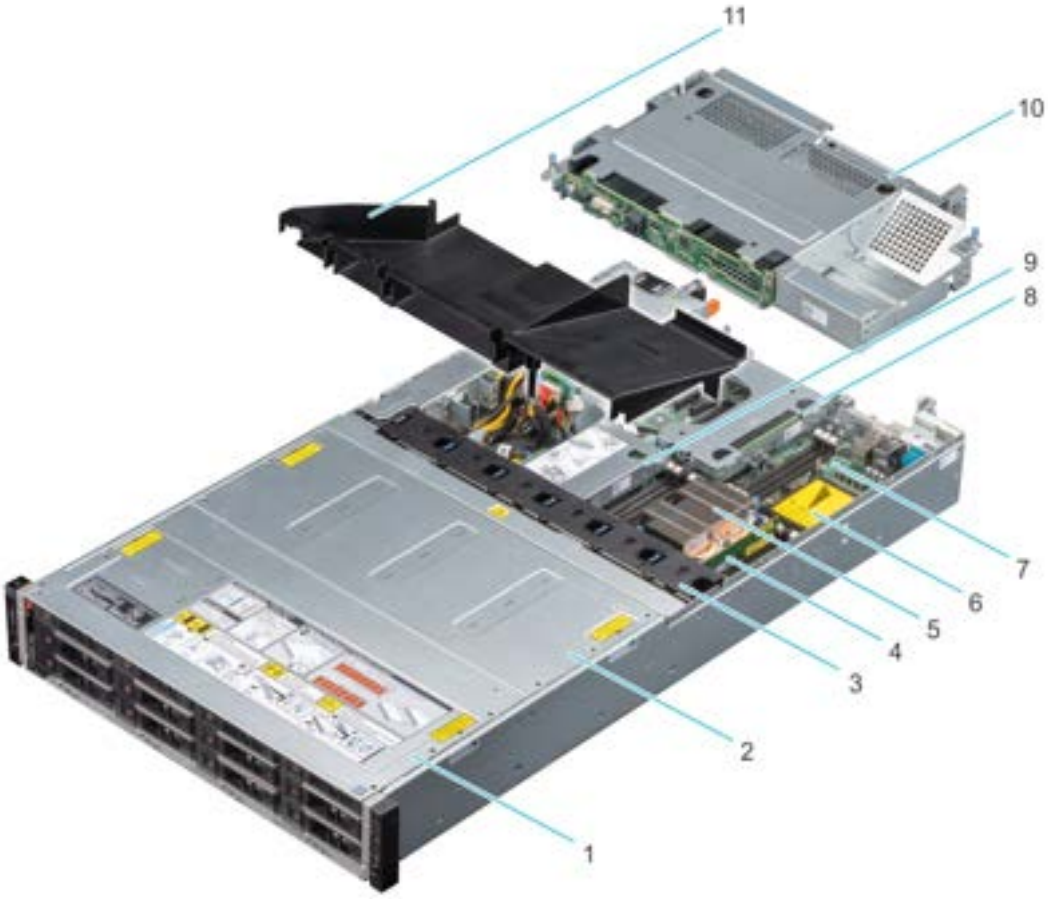

Figure 9. Inside the system with rear drive cage and full height riser

1. Drive bay 1
2. Drive bay 2
3. Fan (6)
4. Memory module
5. Processor and heatsink module 1
6. Processor 2 dust cover
7. System board
8. 1 full height riser (or 2 low-profile risers)
9. Internal PERC riser
10. Drive cage (rear)
11. Air shroud (24 x 3.5 inch + 2 x 3.5 inch rear hard drive system)

Locating the information tag of your system

Your system is identified by a unique Express Service Code and Service Tag number. You can view the Express Service Code and Service Tag by pulling out the information tag located on the rear of the system. Alternatively, the information may be on a sticker on the chassis of the system. Alternatively, the information may be on the Mini Enterprise Service Tag (MEST) label on the chassis, on the rear of the system. This information is used by Dell to route support calls to the appropriate personnel.

Figure 10. Locating the information tag of your system

1. Information tag (Top view)
2. iDRAC MAC address and iDRAC secure password label
3. Express Service Tag
4. QRL label
5. Information tag (back view)

System Information Label

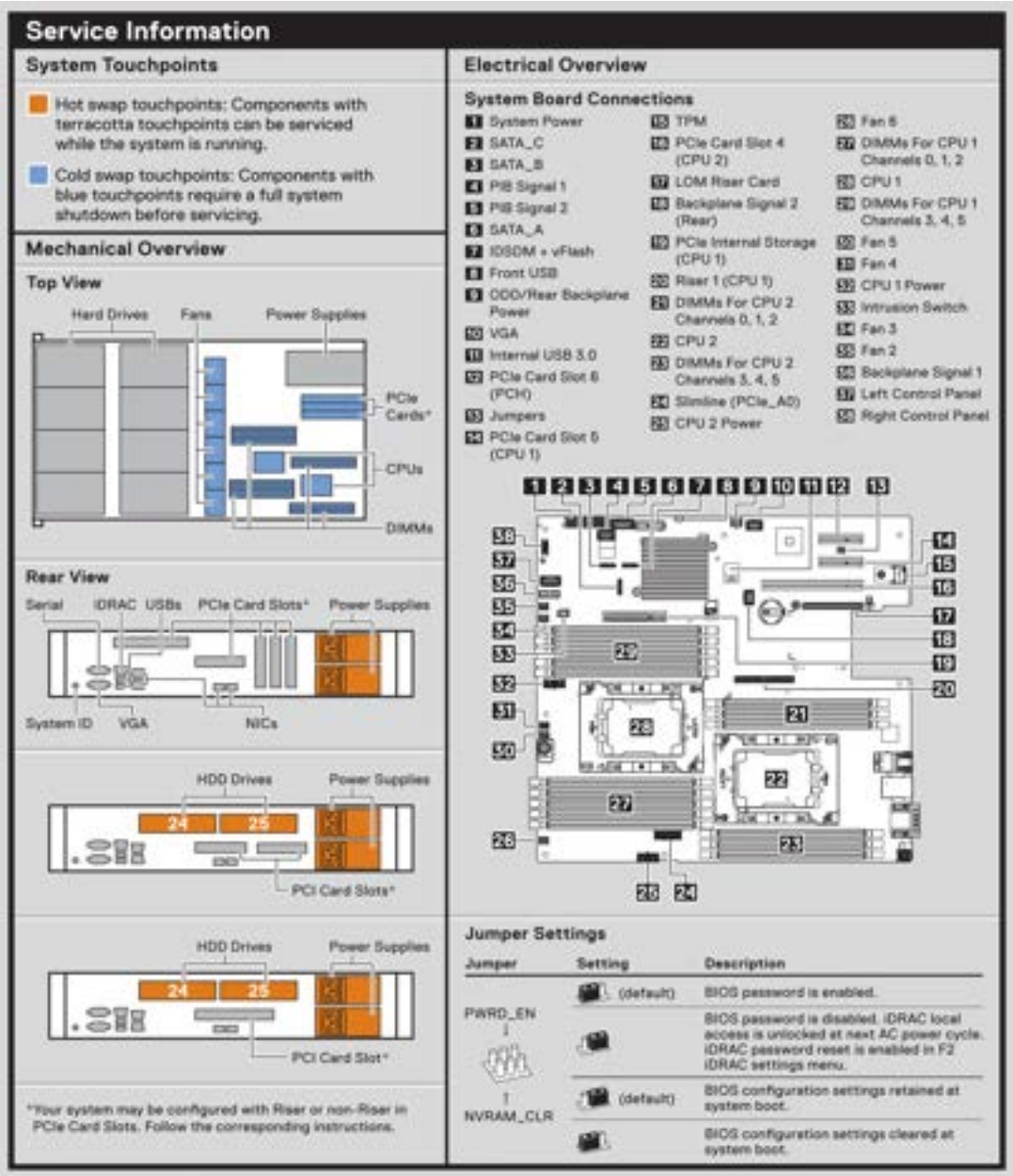

Figure 11. PowerEdge R740xd2 – Service information

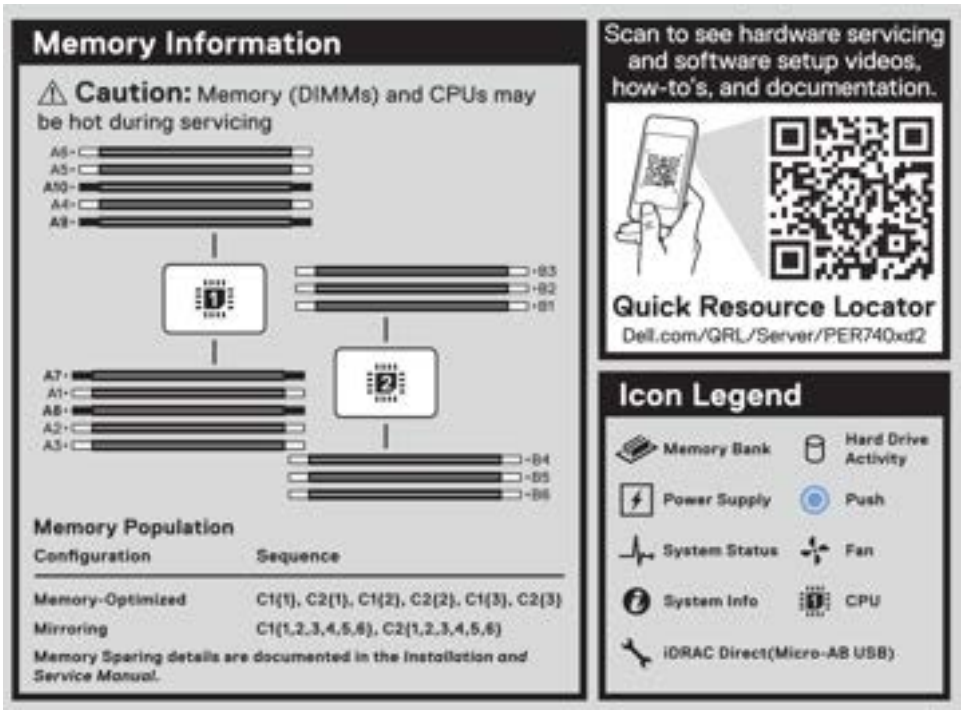

Figure 12. Memory information

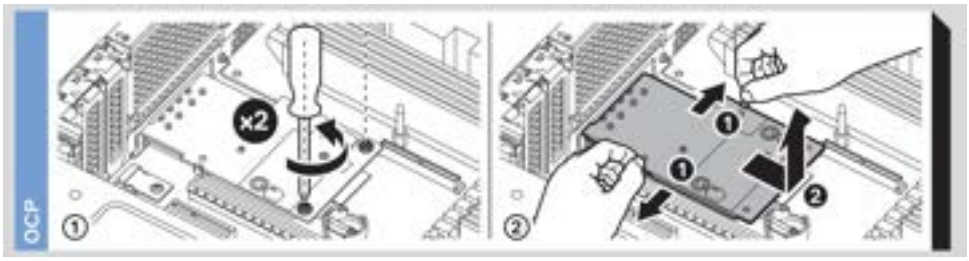

Figure 13. OCP installation

Figure 14. Riser installation

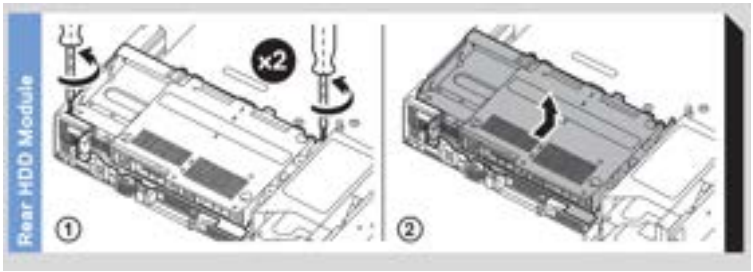

Figure 15. Rear drive cage installation

Figure 16. Drive Bays Operation

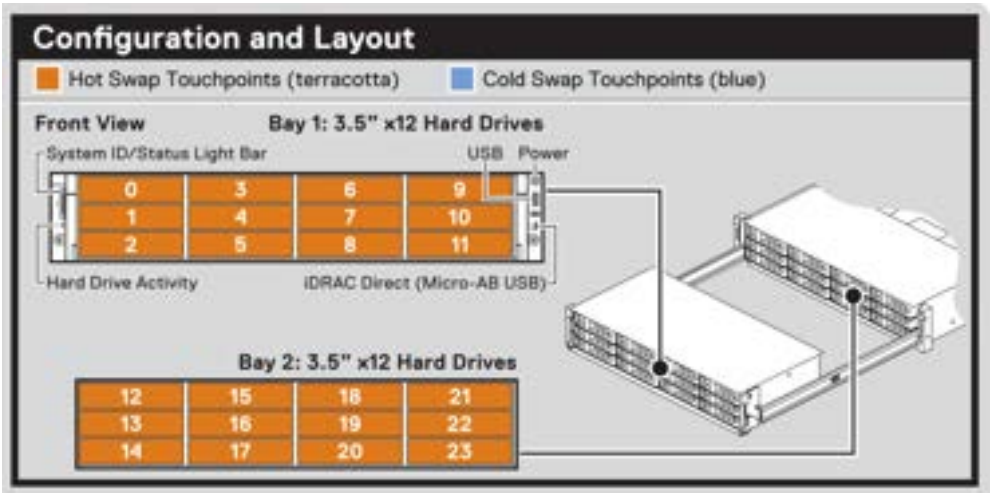

Figure 17. Drive configuration and layout

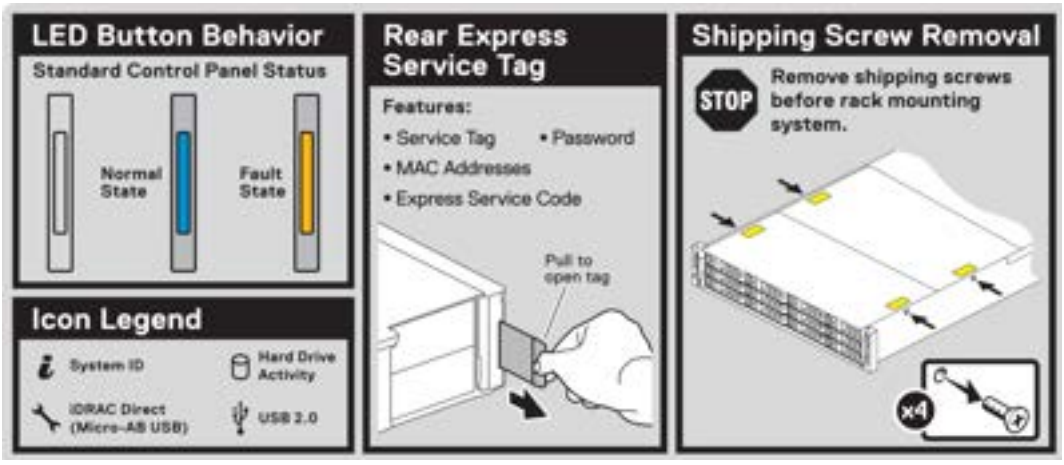

Figure 18. System LED indicator and Express Service Tag

3

Initial system setup and configuration

Topics:

- Setting up your system
- iDRAC configuration
- Options to install the operating system

Setting up your system

Perform the following steps to set up your system:

Steps

1. Unpack the system.
2. Remove the shipping screws from the sides of the system, before installing it in the rack.

   CAUTION: Do not attempt to lift the system by yourself to avoid potential injury. Do not apply uneven force to either end of the system to prevent the chassis from distorting or bending. Keep the system parallel to the ground when lifting and moving it.
3. Install the system into the rack. For more information about installing the system into the rack, see the *Rail Installation Guide* at www.dell.com/poweredgemanuals.
4. Connect the peripherals to the system.
5. Connect the system to its electrical outlet.
6. Power on the system by pressing the power button or by using iDRAC.
7. Power on the attached peripherals.

   For more information about setting up your system, see the *Getting Started Guide* that shipped with your system.

   For information on how to manage basic settings and features of the system, see the Dell EMC PowerEdge R740xd2 BIOS and UEFI Reference Guide on the product documentation page.

iDRAC configuration

The Integrated Dell Remote Access Controller (iDRAC) is designed to make system administrators more productive and improve the overall availability of Dell systems. iDRAC alerts administrators about system issues and enables them to perform remote system management. This reduces the need for physical access to the system.

Options to set up iDRAC IP address

To enable communication between your system and iDRAC, you must first configure the network settings based on your network infrastructure.

NOTE: For static IP configuration, you must request for it at the time of purchase.

This option is set to **DHCP** by Default. You can set up the IP address by using one of the following interfaces:

Interfaces	Document/Section
iDRAC Settings utility	*Dell Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals

Interfaces	Document/Section
Dell Deployment Toolkit	*Dell Deployment Toolkit User's Guide* at www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Dell Lifecycle Controller	*Dell Lifecycle Controller User's Guide* at www.dell.com/poweredgemanuals
iDRAC Direct	See *Dell Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals

NOTE: To access iDRAC, ensure that you connect the ethernet cable to the iDRAC9 dedicated network port or use iDRAC direct by using the USB cable. You can also access iDRAC through the shared LOM mode, if you have opted for a system that has the shared LOM mode enabled.

Log in to iDRAC

You can log in to iDRAC as:

- iDRAC user
- Microsoft Active Directory user
- Lightweight Directory Access Protocol (LDAP) user

If you have opted for secure default access to iDRAC, you must use the iDRAC secure default password available on the system Information tag. If you have not opted for secure default access to iDRAC, then use the default user name and password –`root` and `calvin`. You can also log in by using your Single Sign-On or Smart Card.

NOTE: You must have the iDRAC credentials to log in to iDRAC.

NOTE: Ensure that you change the default username and password after setting up the iDRAC IP address.

NOTE: The Intel Quick Assist Technology (QAT) on the Dell EMC PowerEdge R740xd2 is supported with chipset integration and is enabled through an optional license. The license files are enabled on the sleds through iDRAC.

For more information about drivers, documentation, and white papers on the Intel QAT, see https://01.org/intel-quickassist-technology.

For more information about logging in to the iDRAC and iDRAC licenses, see the latest *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals.

You can also access iDRAC by using RACADM. For more information, see the *RACADM Command Line Interface Reference Guide* at www.dell.com/poweredgemanuals.

Options to install the operating system

If the system is shipped without an operating system, install a supported operating system by using one of the following resources:

Table 1. Resources to install the operating system

Resources	Location
iDRAC	www.dell.com/idracmanuals
Lifecycle Controller	www.dell.com/idracmanuals > Lifecycle Controller
OpenManage Deployment Toolkit	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Dell certified VMware ESXi	Virtualization solutions
Installation and How-to videos for supported operating systems on PowerEdge systems	Supported Operating Systems for Dell EMC PowerEdge systems

Methods to download firmware and drivers

You can download the firmware and drivers by using any of the following methods:

Table 2. Firmware and drivers

Methods	Location
From the Dell Technologies support site	www.dell.com/support/home
Using Dell Remote Access Controller Lifecycle Controller (iDRAC with LC)	www.dell.com/idracmanuals
Using Dell Repository Manager (DRM)	www.dell.com/openmanagemanuals > Repository Manager
Using Dell OpenManage Essentials	www.dell.com/openmanagemanuals > OpenManage Essentials
Using Dell OpenManage Enterprise	www.dell.com/openmanagemanuals > OpenManage Enterprise
Using Dell Server Update Utility (SUU)	www.dell.com/openmanagemanuals > Server Update Utility
Using Dell OpenManage Deployment Toolkit (DTK)	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Using iDRAC virtual media	www.dell.com/idracmanuals

Downloading drivers and firmware

Dell EMC recommends that you download and install the latest BIOS, drivers, and systems management firmware on your system.

Prerequisites

Ensure that you clear the web browser cache before downloading the drivers and firmware.

Steps

1. Go to www.dell.com/support/home.
2. In the **Drivers & Downloads** section, type the Service Tag of your system in the **Enter a Service Tag or product ID** box, and then click **Submit**.

   NOTE: If you do not have the Service Tag, select **Detect Product** to allow the system to automatically detect the Service Tag, or click **View products**, and navigate to your product.

3. Click **Drivers & Downloads**.
   The drivers that are applicable to your system are displayed.
4. Download the drivers to a USB drive, CD, or DVD.

4

Installing and removing system components

Topics:

- Safety instructions
- Before working inside your system
- After working inside your system
- Recommended tools
- Front bezel
- System cover
- Air shroud
- Internal PERC riser
- Cooling fans
- Intrusion switch
- Drive bay
- Drives
- Drive backplane bracket
- Bay intrusion switch
- Rear drive cage
- Drive backplane
- Cable routing
- System memory
- Processor and heat sink
- Expansion cards and expansion card risers
- M.2 SSD module
- Optional IDSDM / vFlash module
- LOM riser card
- System battery
- Optional internal USB memory key
- Power supply units
- Power interposer board
- System board
- Trusted Platform Module
- Cable chain assembly
- Control panel

Safety instructions

WARNING: Do not attempt to lift the system by yourself to avoid potential injury. Do not apply uneven force to either end of the system to prevent the chassis from distorting or bending. Keep the system parallel to the ground when lifting and moving it.

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

NOTE: This product is intended for restricted access locations, such as a dedicated equipment room or equipment closet, in accordance with the National Electrical Code, American National Standards Institute (ANSI), National Fire Protection Association (NFPA) 70.

Equipment Location - The equipment placed in the restricted access location that can be accessed only by the service personnel or users who have been instructed about the restrictions applied to the location. The location can be accessed using a tool or a key or any other means of security, and is controlled by the authority responsible for the location.

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.

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.

NOTE: It is recommended that you always use an antistatic mat and antistatic strap while working on components inside the system.

CAUTION: Keep hands clear off the rotating fan blades of the high performance fans, as it may cause serious injury or cuts. Ensure system is powered off before servicing.

Before working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Power off the system and all attached peripherals.
2. Disconnect the system from the electrical outlet, and disconnect the peripherals.

After working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Reconnect the peripherals and connect the system to the electrical outlet.
2. Power on the attached peripherals and then power on the system.

Recommended tools

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

- Key to the bezel lock

  The key is required only if your system includes a bezel.

- Phillips #1 screwdriver
- Phillips #2 screwdriver
- Torx #T15 screwdriver
- 5mm hex nut screwdriver
- Plastic scribe
- 1/4 inch flat blade screwdriver
- Wrist grounding strap connected to the ground
- ESD mat

You need the following tools to assemble the cables for a DC power supply unit:

- AMP 90871-1 hand-crimping tool or equivalent
- Tyco Electronics 58433-3 or equivalent
- Wire-stripper pliers to remove insulation from size 10 AWG solid or stranded, insulated copper wire

  NOTE: Use alpha wire part number 3080 or equivalent (65/30 stranding).

Front bezel

Removing the front bezel

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Keep the bezel key handy.

Steps

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

Figure 19. Removing the front bezel

Next steps

Replace the front bezel.

Installing the front bezel

Prerequisites

1. Follow the safety guidelines listed in Safety instruction.
2. Locate and remove the bezel key.

   NOTE: The bezel key is part of the front bezel package.

Steps

1. Align and insert the tabs on the right end of the bezel into the slots on the system.

   NOTE: Ensure that the drive bay is locked before installing the front bezel, for more information see closing the drive bays section.

2. Fit the left end of the bezel onto the system and press the bezel until you hear the release button click.
3. Lock the bezel.

Figure 20. Installing the front bezel

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.

6. Remove the system from the rack and place it on an ESD work bench. For more information, see the **Rail Installation Guide** at www.dell.com/poweredgemanuals.

Steps

1. Using a 1/4-inch flat head or Phillips #2 screwdriver, turn the lock counterclockwise to the unlock position.
2. Press the release tabs on the system cover, and slide the cover towards the rear of the system.
3. Lift the cover from the system.

Figure 21. Removing the system cover

Installing 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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.

Steps

1. Align the tabs on the system cover with the guide slots on the system.
2. Slide the cover towards the front of the system, until the system cover locks in place.
3. Using a 1/4 inch flat head or Phillips #2 screwdriver, turn the lock clockwise to the lock position.

Figure 22. Installing system cover

Next steps

1. Close the drive bays.
2. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
3. Open the drive bays, install all drives, and then close the drive bays.
4. Install the power supply units.
5. Follow the procedure listed in After working inside your system.

Air shroud

Removing the air shroud

Prerequisites

CAUTION: Never operate your system with the air shroud removed. The system may get overheated quickly, resulting in shutdown of the system and loss of data.

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. If installed, remove the butterfly riser.

Steps

Lift the air shroud away from the system.

Figure 23. Removing air shroud

Figure 24. Removing air shroud for system with rear drive configuration

Next steps

Replace the air shroud.

Installing the air shroud

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. If installed, remove the butterfly riser.

Steps

1. Align the slots on the air shroud with the guide pin on the system.

   NOTE: Route the cable properly to prevent the cable from being pinched or crimped.

2. Lower the air shroud into the system until it is firmly seated.

Figure 25. Installing air shroud

Figure 26. Installing air shroud for system with the rear drive configuration

Next steps

1. If removed, install the butterfly riser.
2. Install the system cover.
3. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
4. Open the drive bays, install all drives, and then close the drive bays.
5. Install the power supply units.
6. Follow the procedure listed in After working inside your system.

Internal PERC riser

Removing the internal PERC riser

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. If installed, remove the rear drive cage.
10. Open the cable guiding latch for easy access.

Steps

1. Lower the plunger and holding the blue touch points, lift the internal PERC riser out of the system.

Figure 27. Removing internal PERC riser

2. Turn over the internal riser so that the PERC card is facing up.

3. Using a Phillips #2 screwdriver, loosen the screws from the cable connector and disconnect the cable connected to the internal PERC card.

Figure 28. Disconnecting the cable from internal PERC card

Next steps

Replace the internal PERC riser.

Installing the internal PERC riser

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. If installed, remove the rear drive cage.

Steps

1. Connect the cable connector to the internal PERC card by aligning it to the guiding pins and replace the screws using a Phillips #2 screwdriver.

Figure 29. Connecting the cable to internal PERC riser

2. Turn over the internal PERC riser and align the internal PERC riser to the PCI slot by holding the blue touch points, and press until fully seated.
3. Lift the plunger to lock the riser in place.

Figure 30. Installing internal PERC riser

Next steps

1. Connect the cables to the backplane and then route the cables to the cable guiding latch and close the latch.
2. If removed, install the rear drive cage.
3. Install the air shroud.
4. Install the system cover.
5. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
6. Open the drive bays, install all drives, and then close the drive bays.
7. Install the power supply units.
8. Follow the procedure listed in After working inside your system.

Removing the PERC card from the internal PERC riser

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. If installed, remove the rear drive cage.
10. Remove the internal PERC riser.

Steps

1. Disconnect the battery cable connected to the PERC card.
2. Pull the PERC card out of the connector on the internal PERC riser.

Figure 31. Removing the PERC card from the internal PERC riser

Next steps

Replace the PERC card into the PERC riser.

Installing PERC card into the internal PERC riser

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. If installed, remove the rear drive cage.
11. Remove the internal PERC riser.

Steps

1. Align the PERC card to the guiding pins on the internal PERC riser and push the card in.
2. Route the battery cable around the riser and connect to the PERC card.

Figure 32. Installing the PERC card into internal PERC riser

Next steps

1. Install the internal PERC riser
2. If removed, install the rear drive cage.
3. Install the air shroud.
4. Install the system cover.
5. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
6. Open the drive bays, install all drives, and then close the drive bays.
7. Install the power supply units.
8. Follow the procedure listed in After working inside your system.

Cooling fans

Removing the cooling fan

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.

7. Remove the system cover.
8. Remove the air shroud.
9. Remove the internal PERC riser.
10. Move the cables out of the way to access the cooling fan cable connector on the system board.

Steps

1. Press the tabs on the fan cable connector and disconnect the cable from the system board.
2. Remove the cable from the cable retention tabs.
3. Press the blue release tab and lift the cooling fan from the cooling fan cage.

NOTE: If removing cooling fan 1, remove the fan cable connector from the power interposer board (PIB).

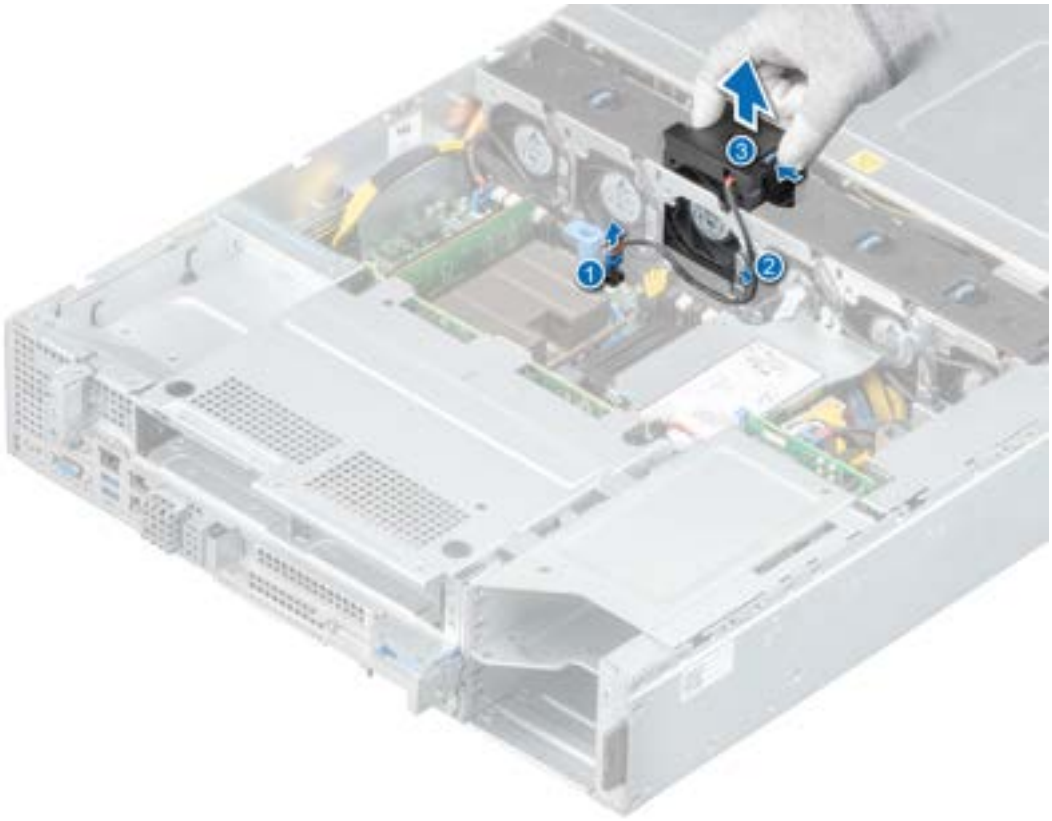

Figure 33. Removing cooling fan

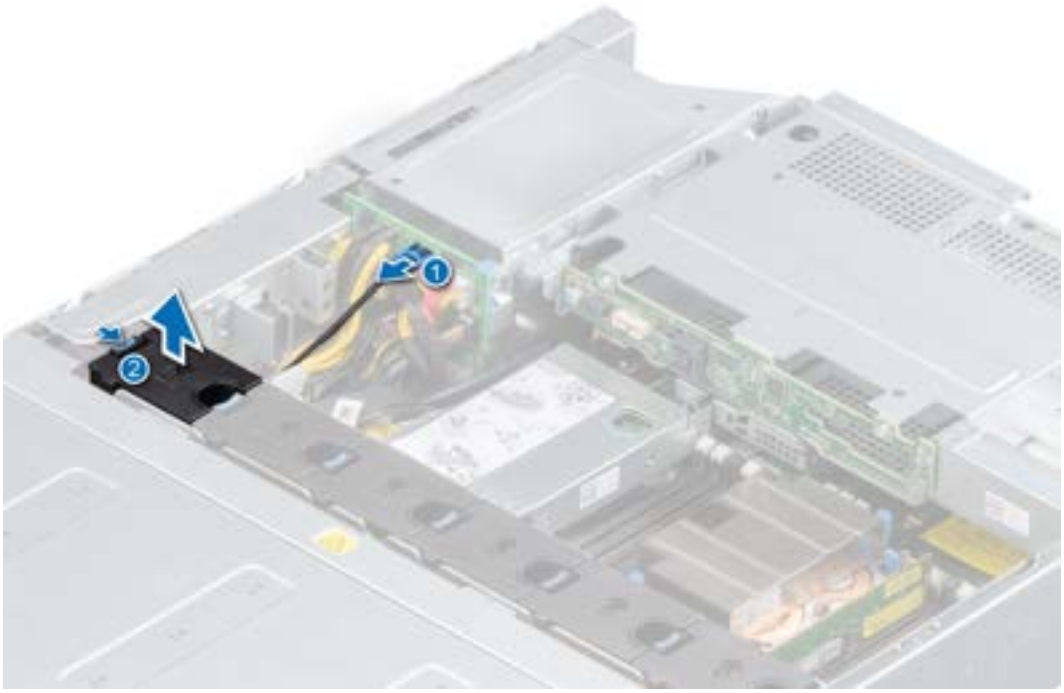

Figure 34. Disconnecting fan 1 cable from PIB connector

Next steps

Replace the cooling fans.

Installing cooling fan

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. Remove the internal PERC riser.
11. Move the cables out of the way to access the cooling fan cable connector on the system board.

Steps

1. Lower the cooling fan into the cooling fan cage, until the blue release tab clicks into place.
2. Route the cable through the cable retention tabs.
3. Connect the power cable to the connector on the system board.

NOTE: If installing cooling fan 1, connect the fan cable connector to the power interposer board (PIB).

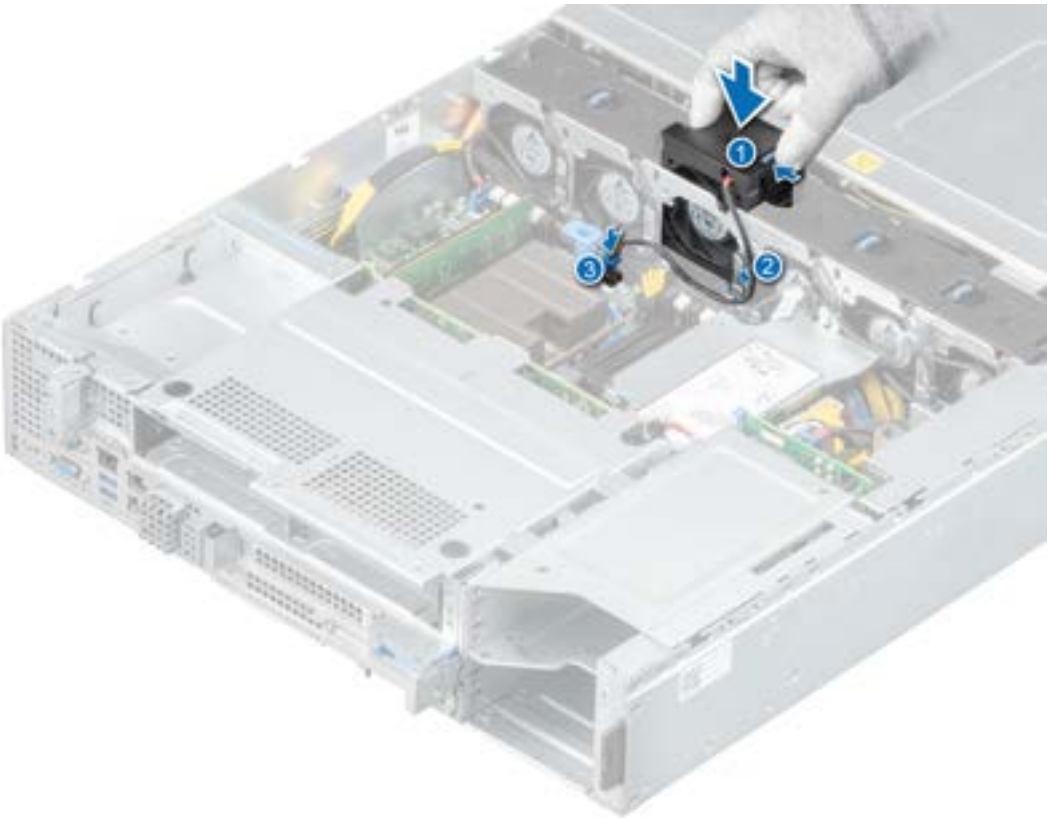

Figure 35. Installing cooling fan

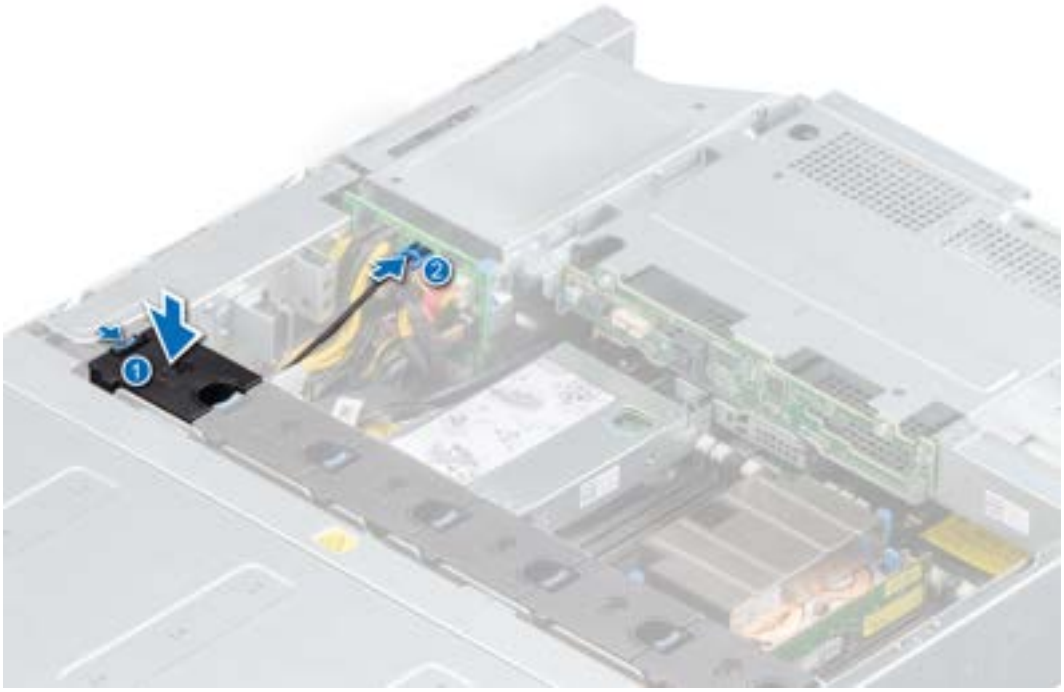

Figure 36. Connecting fan 1 cable to PIB connector

Next steps

1. Install the internal PERC riser.
2. Install the air shroud.

3. Install the system cover.
4. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. Follow the procedure listed in After working inside your system.

Intrusion switch

Removing the intrusion switch

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. Remove the internal PERC riser.

Steps

1. Disconnect and remove the intrusion switch cable from the system board.

   NOTE: Observe the routing of the cable as you remove it from the system. Route the cable properly when you replace it to prevent the cable from being pinched or crimped.

2. Using a plastic scribe, slide the intrusion switch from the slot.

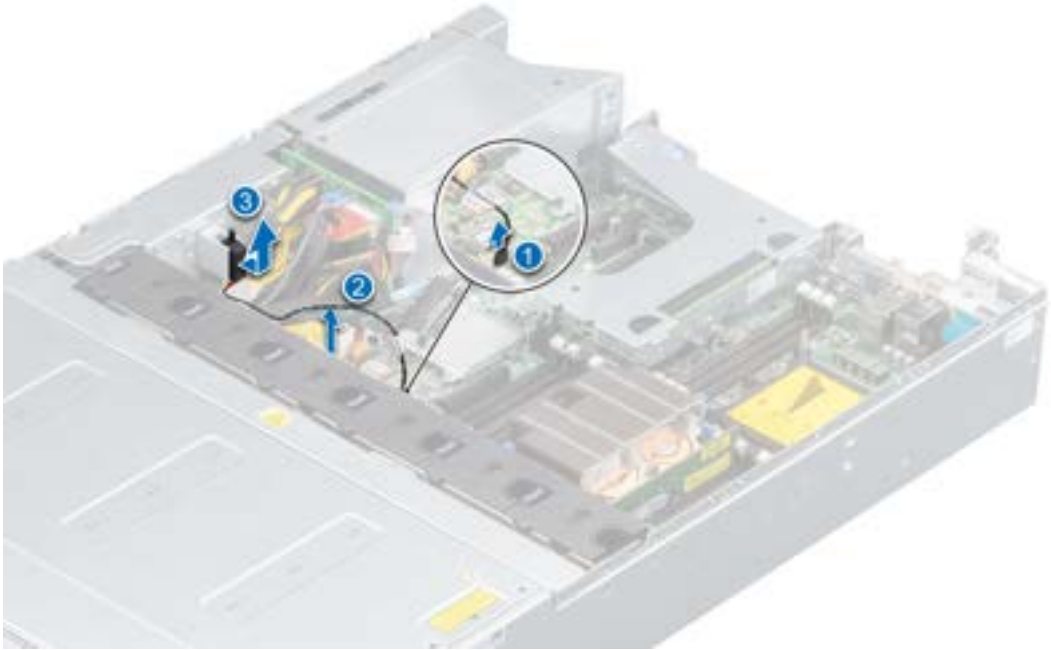

Figure 37. Removing the intrusion switch

Next steps

Replace the intrusion switch.

Installing the intrusion switch

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. Remove the internal PERC riser.

Steps

1. Align and slide intrusion switch into the slot in the system.

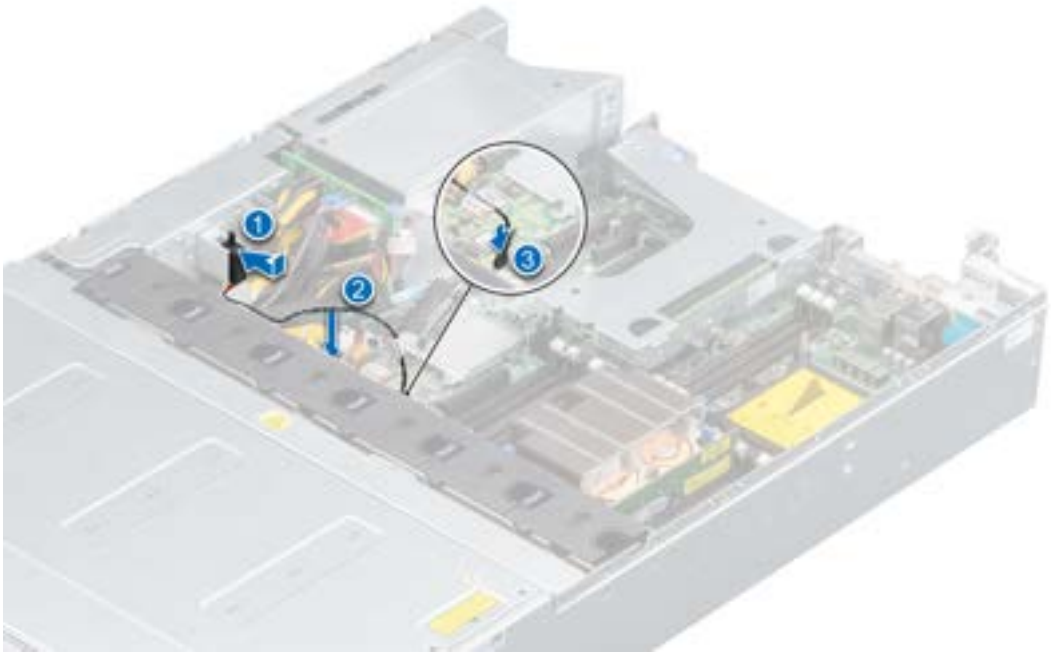

Figure 38. Installing the intrusion switch

2. Connect the intrusion switch cable to the connector on the system board.

NOTE: Route the cable properly when you replace it to prevent the cable from being pinched or crimped.

Next steps

1. Install the internal PERC riser.
2. Install the air shroud.
3. Install the system cover.
4. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.

5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. Follow the procedure listed in After working inside your system.

Drive bay

Opening the drive bays

Prerequisites

CAUTION: Drive bays should not be in service position for more than 5 minutes because of thermal concerns. When the drive bay is open for more than five minutes, the cooling fans spin at a higher speed to provide extra cooling to the system. Thus system health status changes from the normal to critical state, and system event "The BP1 drive bay is kept open for an extended period of time" is logged.

1. Follow the safety guidelines listed in Safety instructions.
2. If installed, remove front bezel.

Steps

1. If locked, unlock the drive bay lock located above the left release latch, by pushing it up.
2. Open the release latches of drive bay 1 and pull the drive bays out.

Figure 39. Opening the drive bays

Next steps

1. If installed, remove a drive blank or install a drive blank.
2. If installed, remove a drive carrier or install a drive carrier.

Closing the drive bays

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. If installed, remove front bezel.

Steps

1. Pull back the blue release tabs on both sides and slide the drive bays into the system, until both the bays lock into place.

Figure 40. Closing drive bays

2. If required, lock the drive bay lock located above left release latch, by pushing it down.

Next steps

If removed, install front bezel.

Drives

Removing a drive blank

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. If installed, remove the front bezel.

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 41. Removing a drive blank

Next steps

Replace a drive blank.

Installing a drive blank

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. If installed, remove the front bezel.

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

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

Figure 42. Installing a drive blank

Next steps

If removed, install the front bezel.

Removing a drive carrier

Prerequisites

1. Follow the safety guidelines listed in Safety Instructions.
2. If installed, remove the front bezel.
3. 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 43. Removing a drive carrier

Next steps

1. Replace a drive carrier.
2. If you are not replacing the drive immediately, insert a drive blank in the empty drive slot to maintain proper system cooling.

Removing the drive from the drive carrier

Prerequisites

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.

   NOTE: If the hard drive or SSD carrier has Torx screw, use Torx 6 (for 2.5-inch drive) or Torx 8 (for 3.5-inch drive) screwdriver to remove the drive.

2. Lift the drive out of the drive carrier.

Figure 44. Removing the drive from the drive carrier

Next steps

If applicable, install a drive into the drive carrier.

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 installed correctly. Inserting a drive carrier and attempting to lock its handle next to a incorrectly installed carrier can damage the incorrectly installed carrier's shield spring, making 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.

NOTE: When a replacement hot swappable drive is installed while the system is powered on, the drive automatically begins to rebuild. Ensure that the replacement drive is blank. Any data on the replacement drive is immediately lost once the drive is installed.

1. Follow the safety guidelines listed in Safety instructions.
2. If installed, 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 45. Installing a drive carrier

Next steps

If removed, install the front bezel.

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 inch-pounds.

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.
3. Using a Phillips #1 screwdriver, replace the screws to secure the drive to the drive carrier.

NOTE: If the hard drive or SSD carrier has Torx screw, use Torx 6 (for 2.5-inch drive) or Torx 8 (for 3.5-inch drive) screwdriver to install the drive.

Figure 46. Installing a drive into the drive carrier

Next steps

Install the drive carrier.

Removing a 2.5-inch drive from a 3.5-inch drive adapter

Prerequisites

NOTE: A 2.5-inch drive is installed in a 3.5-inch drive adapter, which is then installed in the 3.5-inch drive carrier.

Steps

1. Using a Phillips #2 screwdriver, remove the screws from the side of the 3.5-inch drive adapter.

   NOTE: If the 2.5-inch drive has Torx screw, use Torx 6 screwdriver to remove the drive from a 3.5-inch drive adapter.

2. Remove the 2.5-inch drive from the 3.5-inch drive adapter.

Figure 47. Removing a 2.5 inch drive from a 3.5-inch drive adapter

Next steps

Replace a 2.5-inch drive into a 3.5-inch drive adapter.

Installing a 2.5-inch drive into a 3.5-inch drive adapter

Prerequisites

1. Follow the safety guidelines listed in Safety instructions .
2. Remove the drive carrier.

Steps

1. Align the screw holes on the 2.5-inch drive with the screw holes on the 3.5-inch drive adapter.
2. Using a Phillips #2 screwdriver, secure the 2.5-inch drive to the 3.5-inch drive adapter.

NOTE: If the 2.5-inch drive has Torx screw, use Torx 6 screwdriver to install the drive to a 3.5-inch drive adapter.

Figure 48. Installing a 2.5-inch drive into a 3.5-inch drive adapter

Removing a 3.5-inch drive adapter from a 3.5-inch drive carrier

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Using a Phillips #1 screwdriver, remove the screws from the rails on the drive carrier.

   NOTE: If the 3.5-inch drive has Torx screw, use Torx 6 screwdriver to remove the drive from a 3.5-inch drive adapter.

2. Lift the 3.5-inch drive adapter out of the 3.5-inch drive carrier.

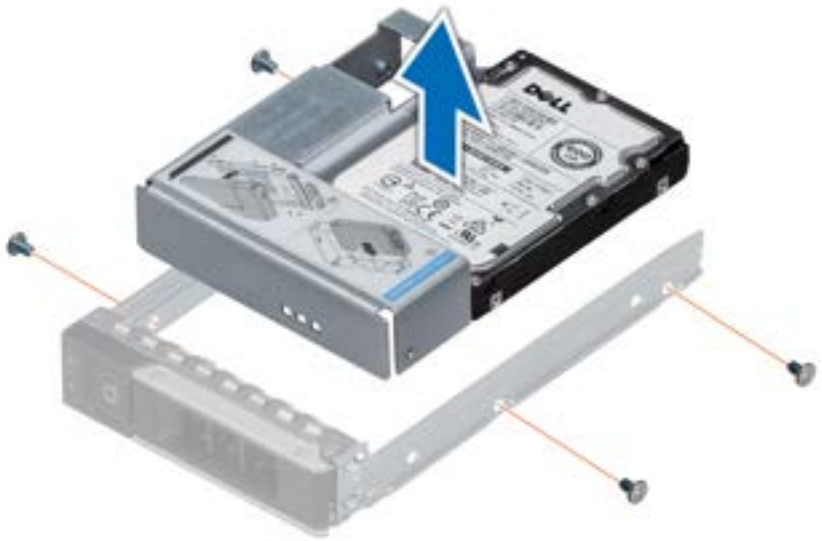

Figure 49. Removing a 3.5-inch drive adapter from a 3.5-inch drive carrier

Next steps

Install the 3.5-inch drive adapter into the 3.5-inch drive carrier.

Installing a 3.5-inch drive adapter into the 3.5-inch drive carrier

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Install the 2.5-inch drive into the 3.5-inch drive adapter.

Steps

1. Insert the 3.5-inch drive adapter into the 3.5-inch drive carrier with the connector end of the drive toward the back of the 3.5-inch drive carrier.
2. Align the screw holes on the 3.5-inch drive adapter with the holes on the 3.5-inch drive carrier.
3. Using a Phillips #1 screwdriver, secure the 3.5-inch drive adapter to the 3.5-inch carrier.

NOTE: If the 3.5-inch drive has Torx screw, use Torx 6 screwdriver to install the drive to a 3.5-inch drive adapter.

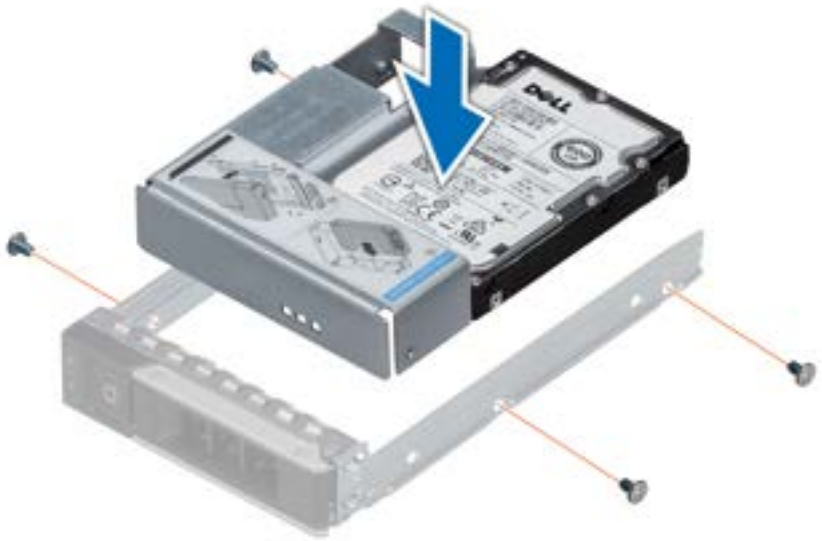

Figure 50. Installing a 3.5-inch drive adapter into the 3.5-inch drive carrier

Next steps

1. Install the 3.5-inch drive carrier into the system.
2. If removed, install the front bezel.

Drive backplane bracket

Removing the drive bay 1 backplane bracket

Prerequisites

NOTE: Ensure that the drive bay 1 and 2 is in open position to access the backplane bracket.

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. If installed, remove the front bezel.
4. Remove all the drives from drive bay 1.
5. Open the drive bays.

Steps

1. Using a Phillips #1 screwdriver, remove the screws on top of the drive bay 1.
2. Slide the bracket to the right to disengage it from the slots at the bay base in drive bay 1.
3. Lift the bracket away from the system.

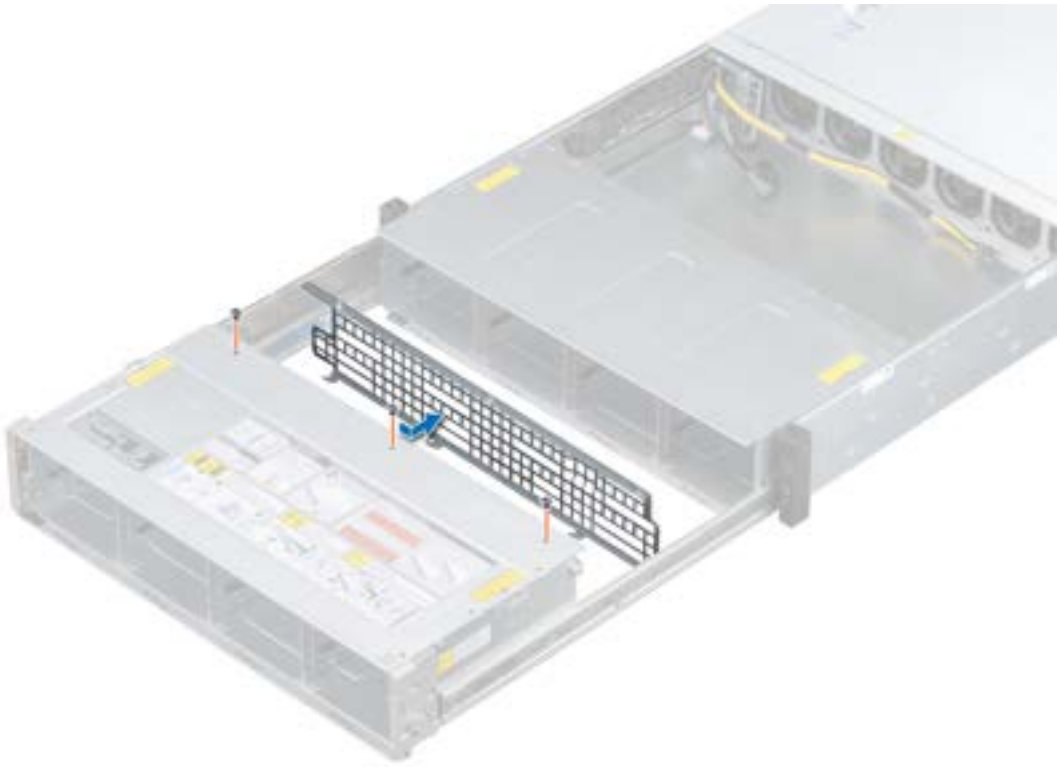

Figure 51. Removing bay 1 backplane bracket

Next steps

Replace the drive bay 1 backplane bracket.

Installing the drive bay 1 backplane bracket

Prerequisites

Follow the safety guidelines listed in Safety instructions.

1. Follow the procedure listed in Before working inside your system.
2. If installed, remove the front bezel.
3. Remove all the drives from drive bay 1.
4. Open the drive bays.

Steps

1. Align the backplane bracket with the two slots at the bay base in drive bay 1.
2. Slide the bracket to the left until it is firmly seated and locks into place.
3. Using a Phillips #1 screwdriver, tighten the screws on top of the drive bay to secure the bracket.

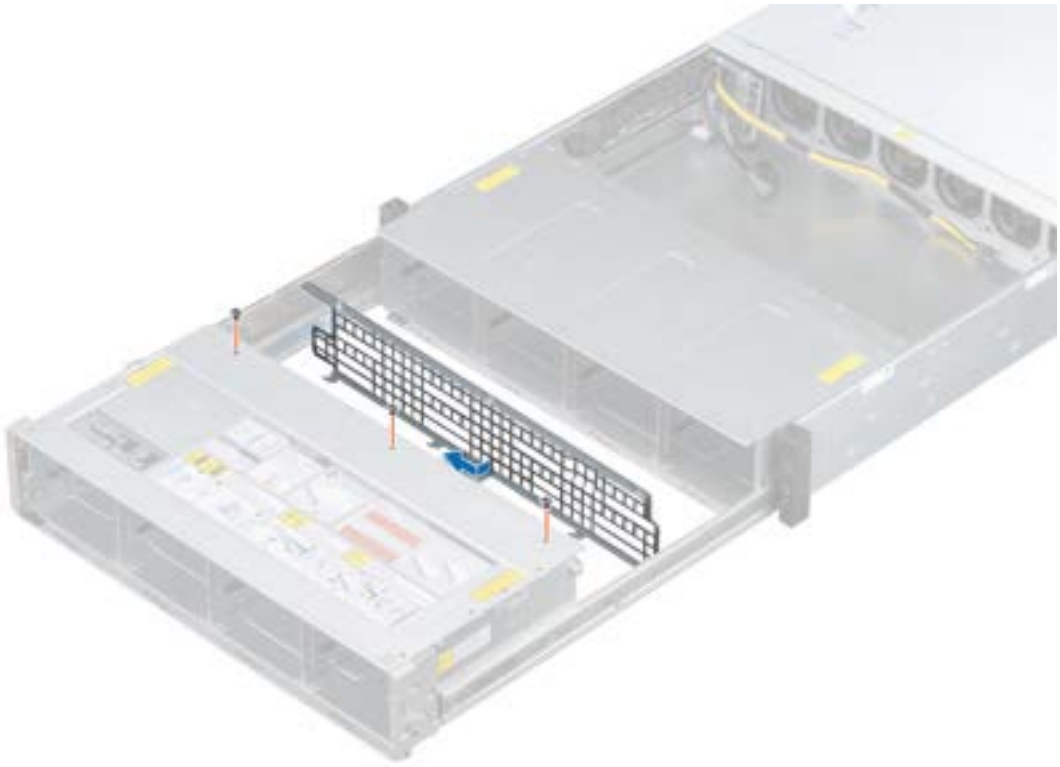

Figure 52. Installing bay 1 backplane bracket

Next steps

1. Install all the drives.
2. Close the drive bays.
3. If removed, install the front bezel.
4. Follow the procedure listed in After working inside your system.

Removing the drive bay 2 backplane brackets

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.
4. If installed, remove the front bezel.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Open the drive bays.

Steps

1. Using a Phillips #1 screwdriver, remove the screws on the top of the drive bay 2, securing the backplane brackets.
2. Disconnect the cables of the cable chain assembly connected to the backplane.
3. Slide the brackets to the right to disengage them from the slots on the bay base in drive bay 2.
4. Lift the right bracket away from the system and move the left bracket away from the drive bay.

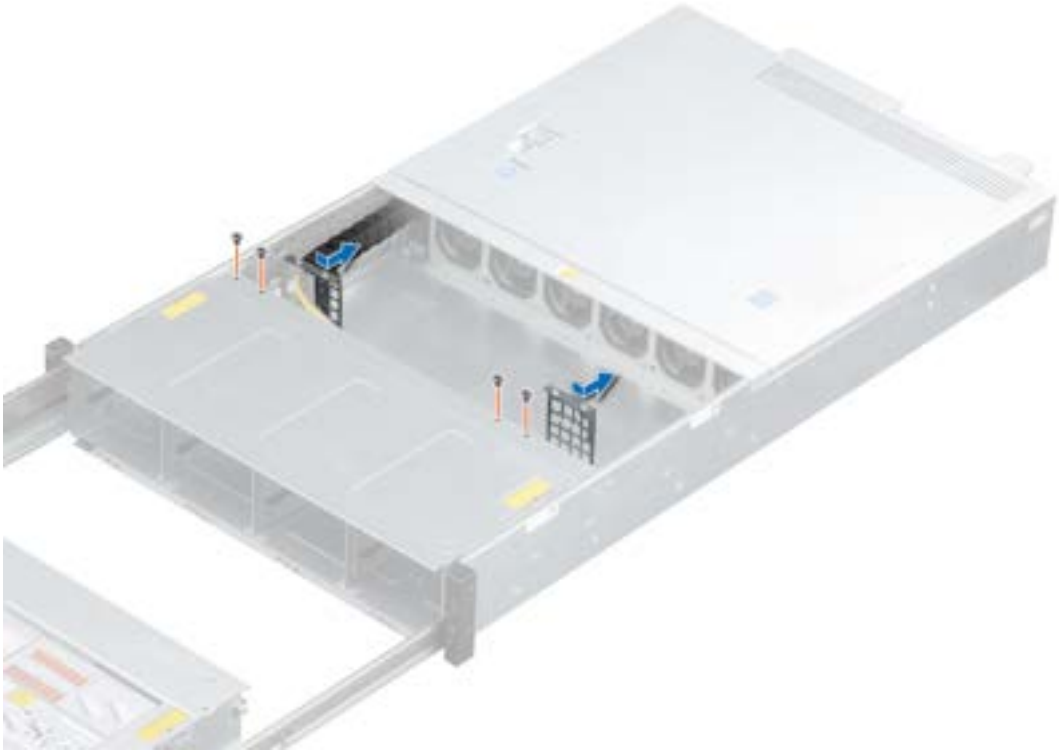

Figure 53. Removing bay 2 backplane brackets

Next steps

Replace the drive bay 2 backplane brackets.

Installing the drive bay 2 backplane brackets

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. If installed, remove the front bezel.
6. Open the drive bays, remove all drives, and then close the drive bays.
7. Remove the power supply units.
8. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
9. Open the drive bays.

Steps

1. Align the backplane brackets with the slots at the bay base in drive bay 2.
2. Slide the brackets to the right until the brackets are firmly seated and lock into the place.
3. Using a Phillips #1 screwdriver, replace the screws on top of the drive bay 2.

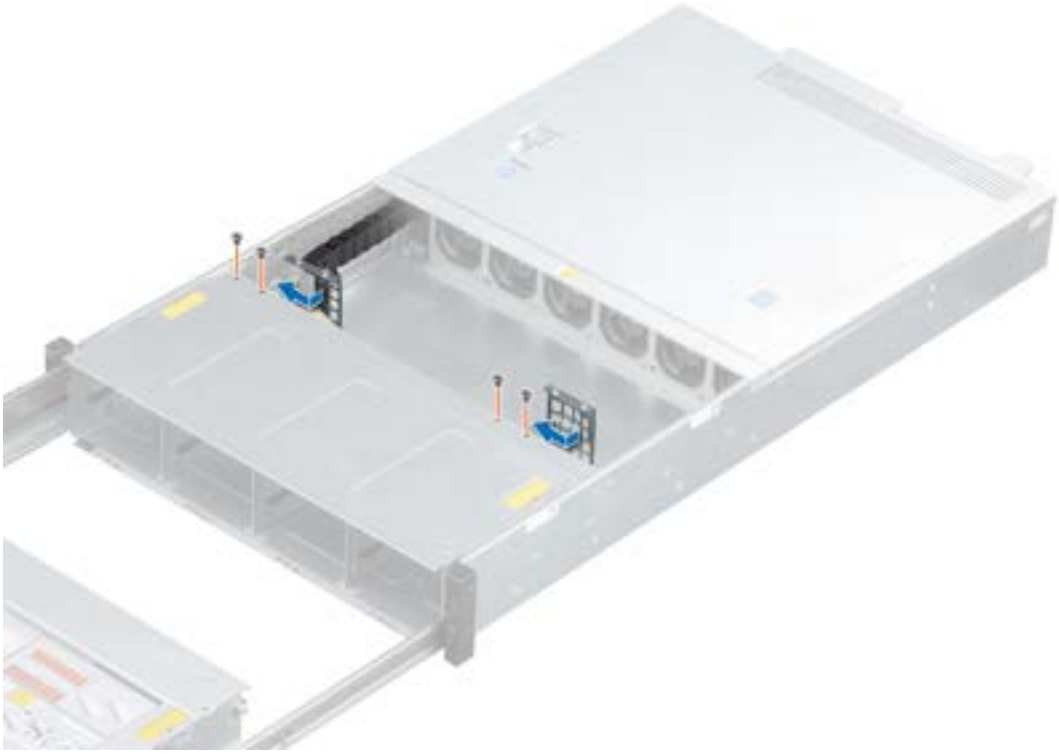

Figure 54. Installing bay 2 backplane brackets

Next steps

1. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
2. Open the drive bays, install all drives, and then close the drive bays.
3. Install the power supply units.
4. If removed, install the front bezel.
5. Follow the procedure listed in After working inside your system.

Bay intrusion switch

Removing bay intrusion switch

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. If installed, remove the front bezel.
4. Open the drive bays.
5. Remove the drive bay 1 bracket.

Steps

1. Disconnect the intrusion switch cable connected to the backplane of drive bay 1.
2. Using a Phillips #1 screwdriver, remove the screws securing the intrusion switch to the intrusion switch slot.
3. Disengage the intrusion switch from the intrusion switch slot and remove it from the system.

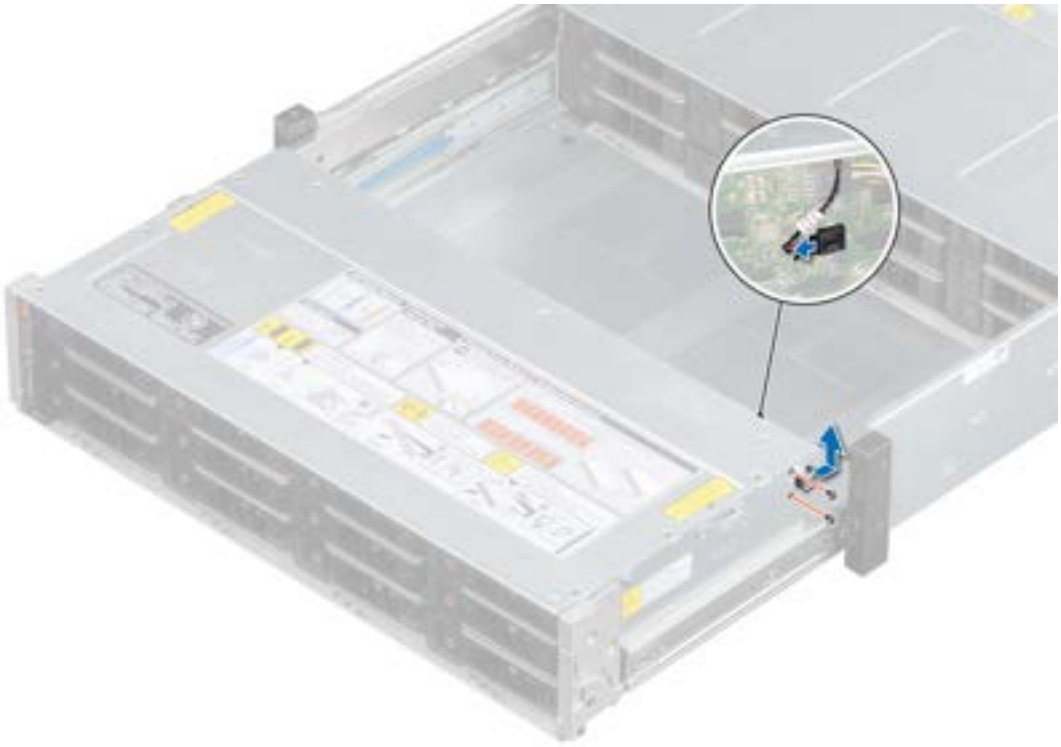

Figure 55. Removing the bay intrusion switch

Next steps

Replace the bay intrusion switch.

Installing bay intrusion switch

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. If installed, remove the front bezel.
4. Open the drive bays.
5. Remove the drive bay 1 bracket.

Steps

1. Align the intrusion switch to the intrusion switch slot in drive bay 1.
2. Using a Phillips #1 screwdriver, replace the screws to secure the intrusion switch.
3. Connect the intrusion cable to the backplane of drive bay 1.

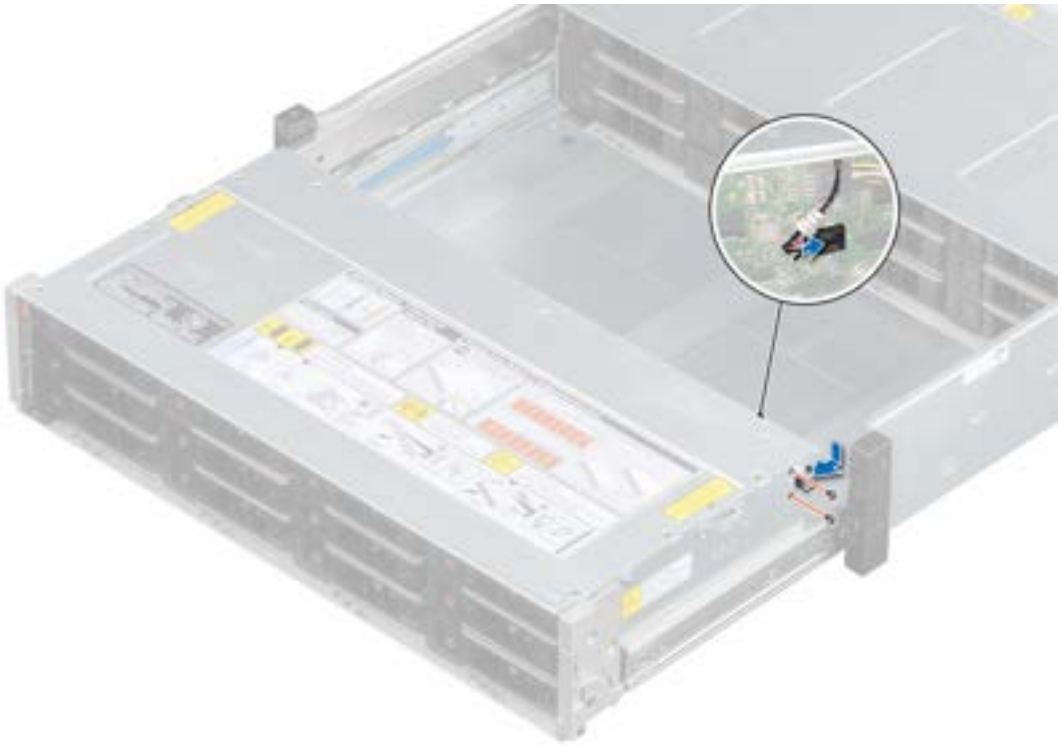

Figure 56. Installing the bay intrusion switch

Next steps

1. Install the drive bay 1 bracket.
2. Close the drive bays.
3. If removed, install the front bezel.
4. Follow the procedure listed in After working inside your system.

Rear drive cage

Removing the rear drive cage

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. Remove the rear drives.
10. Disconnect all the cables from the rear drive backplane.

Steps

1. Using Phillips #2 screwdriver, loosen the screws that secure the drive cage to the system.

2. Disengage the rear drive cage from the chassis by pushing it towards the front of the system and lift the drive cage away from the system.

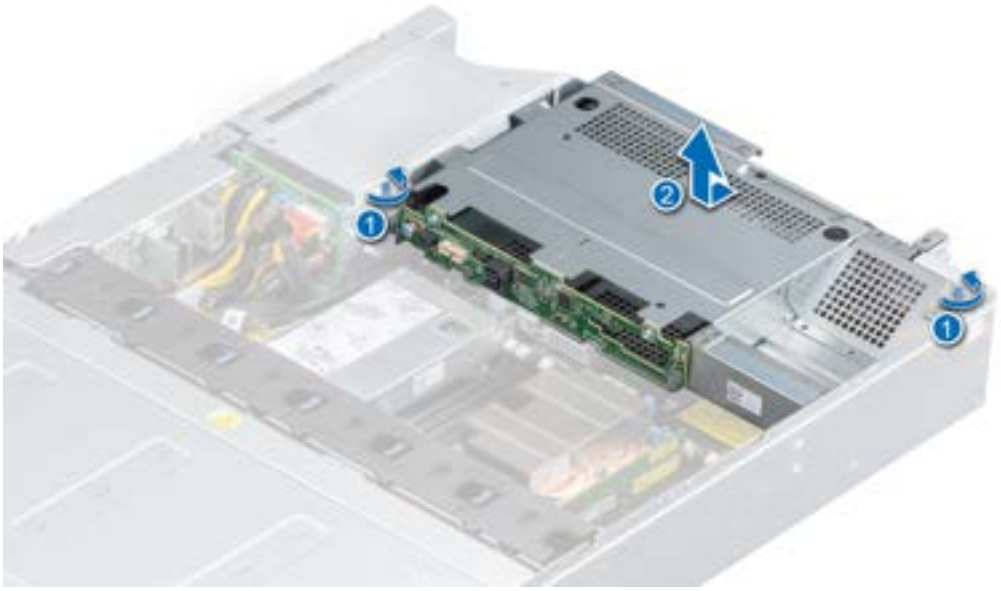

Figure 57. Removing the rear drive cage

Next steps

Replace the rear drive cage.

Installing the rear drive cage

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. Remove all the rear drives.
11. Disconnect all the cables from the rear drive backplane.

Steps

1. Lower the drive cage into the system and push the rear drive cage towards the rear of the system, until it is firmly seated.
2. Using Phillips #2 screwdriver, tighten the screws.

Figure 58. Installing the rear drive cage

Next steps

1. Reconnect all the disconnected cables to the rear drive backplane.
2. Install the rear drives.
3. Install the air shroud.
4. Install the system cover.
5. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals
6. Open the drive bays, install all drives, and then close the drive bays.
7. Install the power supply units.
8. Follow the procedure listed in After working inside your system.

Drive backplane

Drive backplane guidelines

Depending on your system configuration, the drive backplanes supported in PowerEdge R740xd2 are listed here:

Table 3. Supported backplane options for PowerEdge R740xd2 system

System	Supported backplane options
PowerEdge R740xd2	3.5-inch (x12) SAS/SATA/SSD backplane (front)
	3.5-inch (x2) SAS/SATA/SSD backplane (rear)

NOTE: The backplane for both drive bay 1 and bay 2 is identical.

Figure 59. 12 x 3.5-inch drive backplane

1. Power connector (J_BP_PWR1)
2. SAS/SATA cable connector (BP SAS A1)
3. SAS/SATA cable connector (BP SAS A2)
4. Signal connector (J_BP_SIG1)
5. SAS/SATA cable connector (BP SAS B0)
6. SAS/SATA cable connector(BP SAS A0)
7. Intrusion switch cable connector

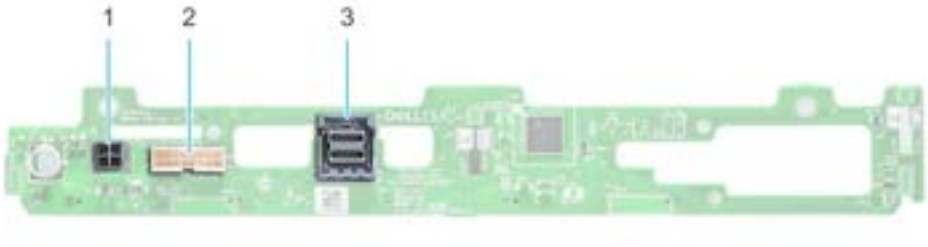

Figure 60. 2 x 3.5-inch drive backplane (rear)

1. Power connector (J_BP_PWR)
2. Signal connector (J_BP_SIG)
3. SAS cable connector (J_SAS_A)

Removing the drive bay 1 backplane

Prerequisites

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

CAUTION: Note the number of each drive and temporarily label them before you remove the drive so that you can replace them in the same location.

NOTE: Ensure that the drive bay is fully open to access the backplane.

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. If installed, remove front bezel.
4. Remove all the drives from the drive slots from bay 1.
5. Open the drive bays.
6. Remove the drive bay 1 bracket.
7. Remove the bay intrusion switch.
8. Disconnect all the cables from the backplane.

Steps

1. Using Phillips #2 screwdriver, remove all the screws securing the backplane.

Figure 61. Removing the screws from the backplane

2. Hold the backplane by the edges and remove it from the bay.

Figure 62. Removing bay 1 backplane

Next steps

Replace the drive bay 1 backplane.

Installing the drive bay 1 backplane

Prerequisites

Follow the safety guidelines listed in Safety instructions.

NOTE: The procedure to install the backplane is similar for all backplane configurations.

1. Follow the procedure listed in Before working inside your system.

2. If installed, remove front bezel.
3. Remove all the drives from the drive slots from bay 1.
4. Open the drive bays.
5. Remove the drive bay 1 bracket.
6. Remove the bay intrusion switch.
7. Disconnect all the cables from the backplane.

Steps

1. Align the backplane to the guiding pins on the bay.
2. Using Phillips #2 screwdriver, tighten all the screws to secure the backplane.

Figure 63. Installing bay 1 backplane

Next steps

1. Install the bay intrusion switch.
2. Connect all the cables to the backplane.
3. Install the drive bay 1 bracket.
4. Install the drives back into their original locations.
5. Close the drive bays.
6. If removed, install front bezel.
7. Follow the procedure listed in After working inside your system.

Removing the drive bay 2 backplane

Prerequisites

CAUTION: Note the number of each drive and temporarily label them before you remove the drive so that you can replace them in the same location.

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Open the drive bays.

   NOTE: Ensure that the drive bay is fully open to access the backplane.
8. Remove the drive bay 2 brackets.
9. Disconnect all the cables from the backplane.

Steps

1. Using Phillips #2 screwdriver, remove all the screws securing the backplane.

Figure 64. Removing the screws from the backplane

2. Hold the backplane by the edges and remove it from the bay.

Figure 65. Removing bay 2 backplane

Next steps

Replace the drive bay 2 backplane.

Installing the drive bay 2 backplane

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. If installed, remove the front bezel.
6. Open the drive bays, remove all drives, and then close the drive bays.
7. Remove the power supply units.
8. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
9. Open the drive bays.
10. Remove the drive bay 2 brackets.
11. Disconnect all the cables from the backplane.

Steps

1. Align the backplane to the guiding pins in the bay.
2. Using Phillips #2 screwdriver, tighten all the screws to secure the backplane.

Figure 66. Installing bay 2 backplane

Next steps

1. Connect all the cables to the backplane.
2. Install the drive bay 2 brackets.
3. Close the drive bays.

4. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. If removed, install the front bezel.
8. Follow the procedure listed in After working inside your system.

Removing the rear drive 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 number of each hard drive and temporarily label them before removal so that you can replace them in the same locations.

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the drives from the rear drive cage.
8. Disconnect all the cables from the backplane.
9. Remove the rear drive cage.

Steps

1. Using Phillips #2 screwdriver, remove the screws that secure the drive backplane to the rear drive cage.
2. Disengage and remove the backplane from the hooks on the rear drive cage.

Figure 67. Removing the rear drive backplane

Next steps

Replace the rear drive backplane.

Installing the rear drive backplane

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. If installed, remove front bezel.
6. Open the drive bays, remove all drives, and then close the drive bays.
7. Remove the power supply units.
8. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
9. Remove the drives from the rear drive cage.
10. Disconnect all the cables from the backplane.
11. Remove the rear drive cage.

Steps

1. Use the hooks on the rear drive cage as guides to align the drive backplane.
2. Lower the backplane into the rear drive cage until it is firmly seated.
3. Using Phillips #2 screwdriver, tighten the screws to secure the backplane to the rear drive cage.

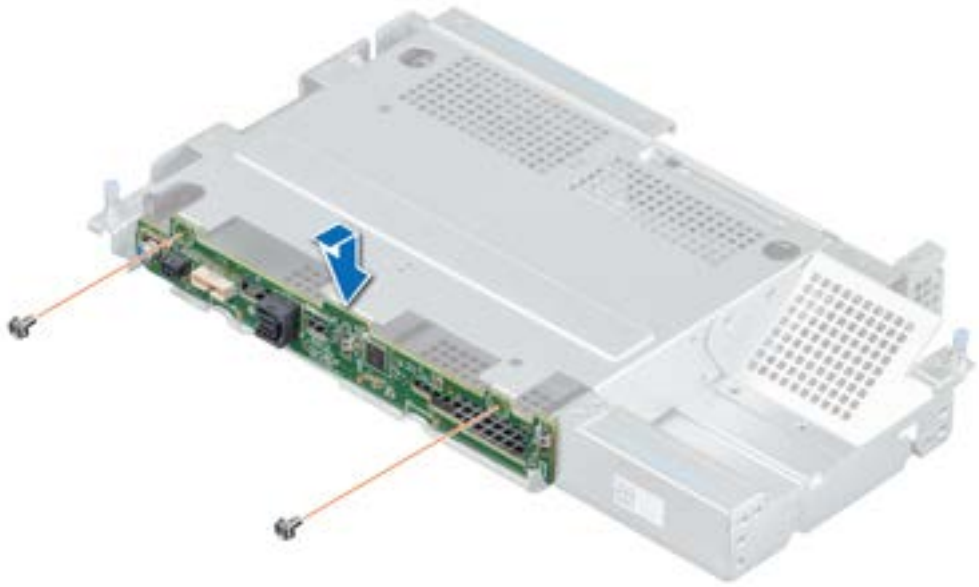

Figure 68. Installing the rear drive backplane

Next steps

1. Install the rear drive cage.
2. Install the drives into the rear drive cage.
3. Connect all the cables to the backplane.
4. Place the system into the rack. for more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.

5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. If removed, install front bezel.
8. Follow the procedure listed in After working inside your system.

Cable routing

Table 4. Cable routing legend

Color	Description	
Red	Power	
Green	Signal	
Grey	Data	

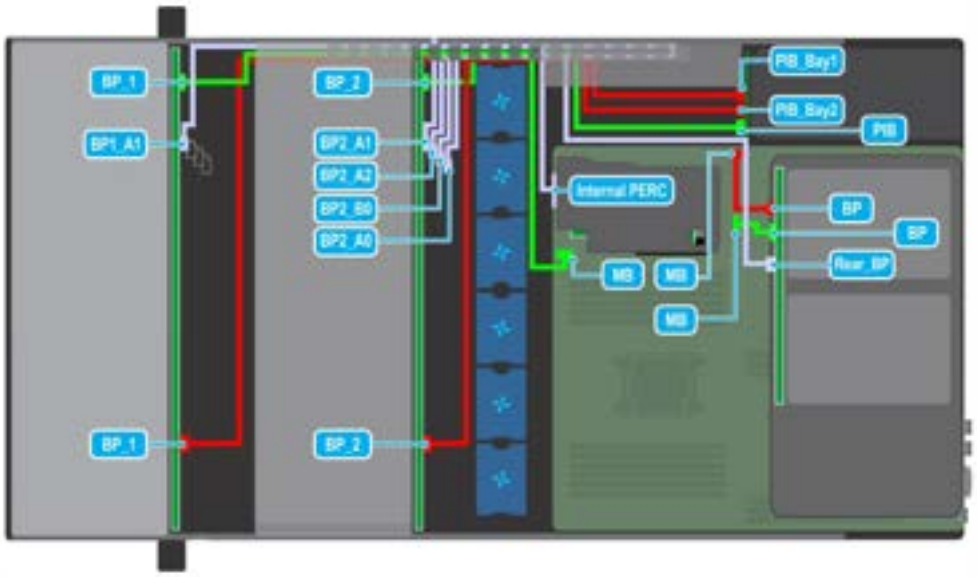

Figure 69. Cable routing - System with 2 x 3.5-inch rear drive backplane connected to cable chain assembly

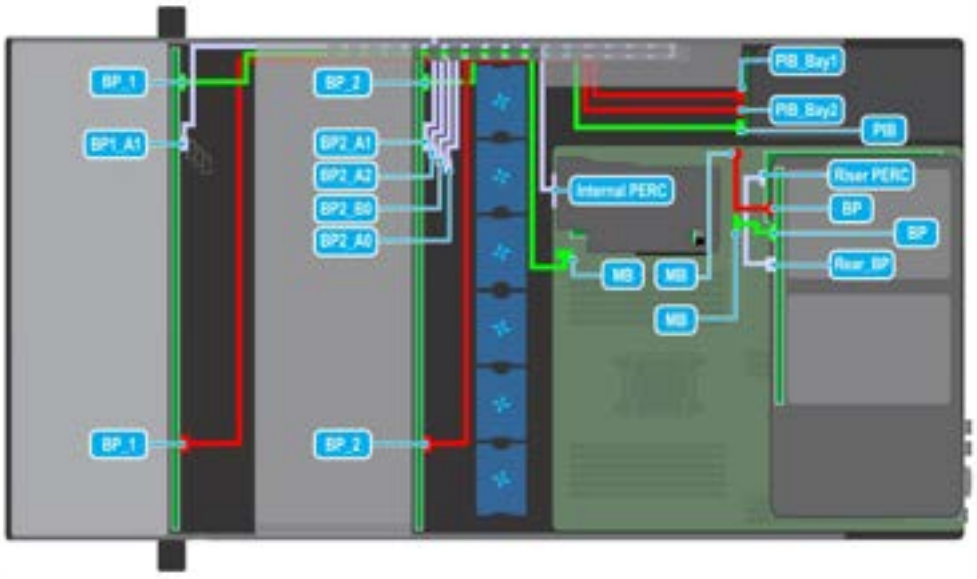

Figure 70. Cable routing - System with 2 x 3.5-inch rear drive backplane connected to riser PERC

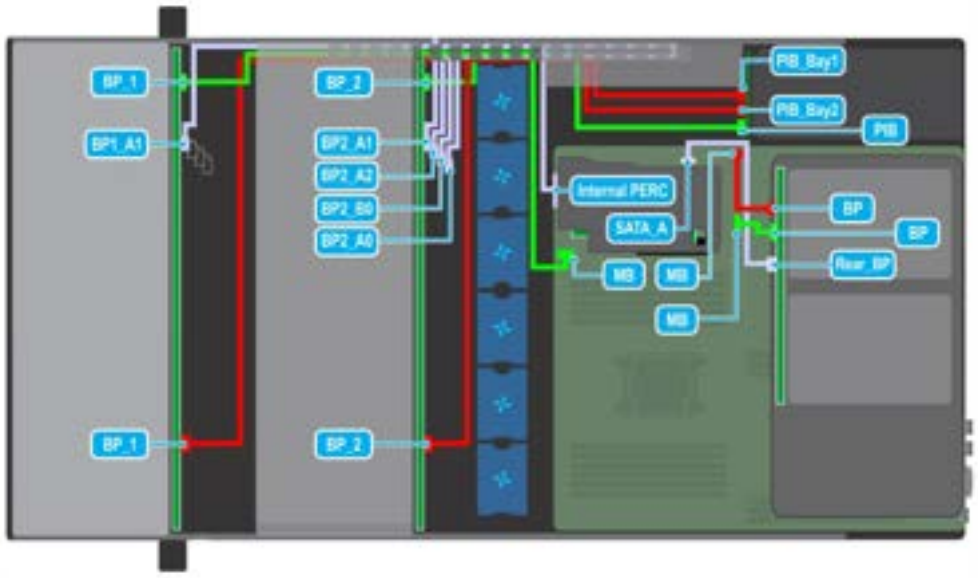

Figure 71. Cable routing - System with 2 x 3.5-inch rear drive backplane connected to system board SATA port

System memory

System memory guidelines

The PowerEdge systems support DDR4 Registered DIMMs (RDIMMs). System memory holds the instructions that are executed by the processor.

Your system contains 16 memory sockets. Processor 1 supports up to 10 memory sockets and Processor 2 supports up to 6 memory sockets. Six memory channels are allocated to each processor. Processor 1 has four 2 DIMM slots per channel and two 1 DIMM slot per channel. Processor 2 has six 1 DIMM per channel.

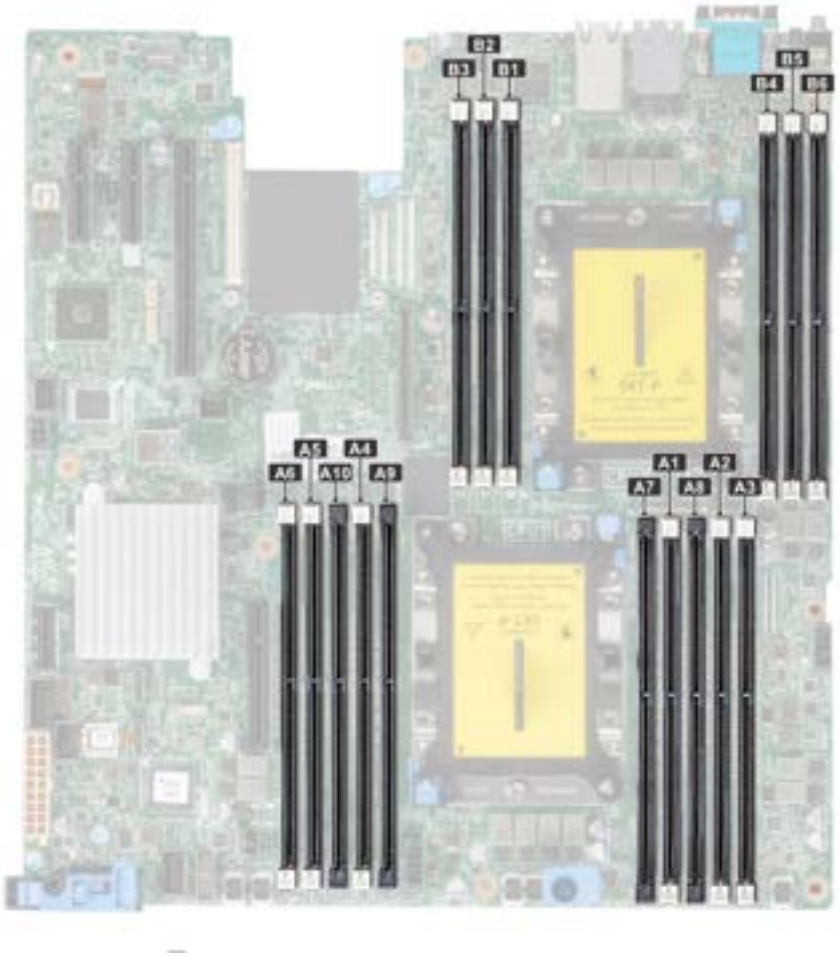

Figure 72. System memory

Memory channels are organized as follows:

Table 5. Memory channels

Processor	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
Processor 1	Slots A1 and A7	Slots A2 and A8	Slots A3	Slots A4 and A9	Slots A5 and A10	Slots A6
Processor 2	Slots B1	Slots B2	Slots B3	Slots B4	Slots B5	Slots B6

Table 6. Memory population

DIMM Type	DIMMs Populated/ Channel	Voltage	Operating Frequency (in MT/s)	Maximum DIMM Rank/ Channel
RDIMM	1	1.2 V	2933, 2666, 2400, 2133, 1866	Dual rank or single rank
	2		2933, 2666, 2400, 2133, 1866	Dual rank or single rank

General memory module installation guidelines

To ensure optimal performance of your system, observe the following general guidelines when configuring your system memory. If your system's memory configurations fail to observe these guidelines, your system might not boot, stop responding during memory configuration, or operate with reduced memory.

The memory bus may operate at frequencies 2933 MT/s, 2666 MT/s, 2400 MT/s, or 2133 MT/s depending on the following factors:

- System profile selected (for example, Performance Optimized, or Custom [can be run at high speed or lower])
- Maximum supported DIMM speed of the processors.
- Maximum supported DIMM speed of the processors.
- Maximum supported speed of the DIMMs

NOTE: MT/s indicates DIMM speed in MegaTransfers per second.

The system supports Flexible Memory Configuration, enabling the system to be configured and run in any valid chipset architectural configuration. The following are the recommended guidelines for installing memory modules:

- All DIMMs must be DDR4.
- x4 and x8 DRAM based memory modules can be mixed.
- Up to two RDIMMs can be populated per channel regardless of rank count.
- A maximum of two different ranked DIMMs can be populated in a channel regardless of rank count.
- If memory modules with different speeds are installed, they will operate at the speed of the slowest installed memory module(s).
- Populate memory module sockets only if a processor is installed.
  - For single-processor systems, sockets A1 to A10 are available.
  - For dual-processor systems, sockets A1 to A10 and sockets B1 to B6 are available.
- Populate all the sockets with white release tabs first, followed by the black release tabs.
- When mixing memory modules with different capacities, populate the sockets with memory modules with the highest capacity first.

  NOTE: For example, if you want to mix 8 GB and 16 GB memory modules, populate 16 GB memory modules in the sockets with white release tabs and 8 GB memory modules in the sockets with black release tabs.
- Memory modules of different capacities can be mixed provided other memory population rules are followed.

NOTE: For example, 8 GB and 16 GB memory modules can be mixed.

- In a dual-processor configuration, the memory configuration for each processor must be identical.

  NOTE: For example, if you populate socket A1 for processor 1, then populate socket B1 for processor 2, and so on.
- Mixing of more than two memory module capacities in one system is not supported.
- Unbalanced memory configurations will result in a performance loss so always populate memory channels identically with identical DIMMs for best performance.
- Populate six identical memory modules per processor (one DIMM per channel) at a time to maximize performance.

DIMM population update for Performance Optimized mode with quantity of 4 and 8 DIMMs per processor.

- When the DIMM quantity is 4 per processor, the population is slot 1, 2, 4, 5.
- When the DIMM quantity is 8 per processor, the population is slot 1, 2, 4, 5, 7, 8, 9, 10.

Mode-specific guidelines

The configurations allowed depend on the memory mode selected in the System BIOS.

Table 7. Memory operating modes

Memory Operating Mode	Description
Optimizer Mode	The **Optimizer Mode** if enabled, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.
Mirror Mode	The **Mirror Mode** if enabled, the system maintains two identical copies of data in memory, and the total available system memory is one half of the total installed physical memory. Half of the installed memory is used to mirror the active memory modules. This feature provides maximum reliability and enables the system to continue running even during a catastrophic memory failure by switching over to the mirrored copy. The installation guidelines to enable Mirror Mode require that the memory modules be identical in size, speed, and technology, and they must be populated in sets of 6 per processor.
Single Rank Spare Mode	**Single Rank Spare Mode** allocates one rank per channel as a spare. If excessive correctable errors occur in a rank or channel, while the operating system is running, they are moved to the spare area to prevent errors from causing an uncorrectable failure. Requires two or more ranks to be populated in each channel.

Table 7. Memory operating modes (continued)

Memory Operating Mode	Description
Multi Rank Spare Mode	**Multi Rank Spare Mode** allocates two ranks per channel as a spare. If excessive correctable errors occur in a rank or channel, while the operating system is running, they are moved to the spare area to prevent errors from causing an uncorrectable failure. Requires three or more ranks to be populated in each channel. With single rank memory sparing enabled, the system memory available to the operating system is reduced by one rank per channel. For example, in a dual-processor configuration with sixteen 16 GB dual-rank memory modules, the available system memory: 16 GB x 16(memory modules) - 8GB(1 rank sparing/channel) x 12(channel) = 256 GB - 96 GB = 160 GB. For multi rank sparing, in a dual-processor configuration with sixteen 64 GB quad-rank memory modules, the available system memory: 64 GB x 16(memory modules) - 32 GB(2 rank sparing/channel) x 12 (channel) = 1024 GB - 384 GB = 640 GB. **NOTE:** To use memory sparing, this feature must be enabled in the BIOS menu of System Setup. **NOTE:** Memory sparing does not offer protection against a multi-bit uncorrectable error.
Dell Fault Resilient Mode	The **Dell Fault Resilient Mode** if enabled, the BIOS creates an area of memory that is fault resilient. This mode can be used by an OS that supports the feature to load critical applications or enables the OS kernel to maximize system availability. **NOTE:** This feature is only supported in Gold and Platinum Intel processors. **NOTE:** Memory configuration has to be of same size DIMM, speed, and rank.

Optimizer 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.

- Dual processor: Populate the slots in round robin sequence starting with processor 1.
  NOTE: Processor 1 and processor 2 population should match.

Table 8. Memory population rules

Processor	Configuration	Memory population	Memory population information
Single processor	Optimizer (Independent channel) population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	• Populate in this order, odd amount allowed. • Odd number of DIMM population is allowed. **NOTE:** Odd number of DIMMs will result in unbalanced memory configurations, which in turn will result in performance loss. It is recommended to populate all memory channels identically with identical DIMMs for best performance.

Table 8. Memory population rules (continued)

Processor	Configuration	Memory population	Memory population information
			• Optimizer population order is not traditional for 4 and 8 DIMM installations of single processor. ○ For 4 DIMMs: A1, A2, A4, A5 ○ For 8 DIMMs: A1, A2, A4, A5, A7, A8, A9, A10
	Mirror population order	{1, 2, 3, 4, 5, 6}	Mirroring is supported with 6 DIMM slots per processor.
	Single rank sparing population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Populate in this order, odd amount allowed. Requires two ranks or more per channel.
	Multi rank sparing population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Populate in this order, odd amount allowed. Requires three ranks or more per channel.
Dual processor (Populate round robin starting with processor1)	Optimized (Independent channel) population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}...	• Odd amount of DIMM slots per processor allowed. • Odd number of DIMM population is allowed. **NOTE:** Odd number of DIMMs will result in unbalanced memory configurations, which in turn will result in performance loss. It is recommended to populate all memory channels identically with identical DIMMs for best performance. • Optimizer population order is not traditional for 8 and 14 DIMM installations of dual processor. ○ For 8 DIMMs: A1, A2, A4, A5, B1, B2, B4, B5 ○ For 14 DIMMs: A1, A2, A4, A5, A7, A8, A9, A10, B1, B2, B3, B4, B5, B6
	Mirroring population order	A{1, 2, 3, 4, 5, 6}, B{1, 2, 3, 4, 5, 6}	Mirroring is supported with 6 DIMM slots per processor.
	Single rank sparing population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}...	Populate in this order, odd amount per processor allowed. Requires two ranks or more per channel.
	Multi rank sparing population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}...	Populate in this order, odd amount per processor allowed. Requires three ranks or more per channel.

Removing a memory module

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.

Locate the appropriate memory module socket.

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.

Steps

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

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

NOTE: If you are removing the memory module permanently, install a memory module blank. The procedure to install a memory module blank is similar to that of the memory module.

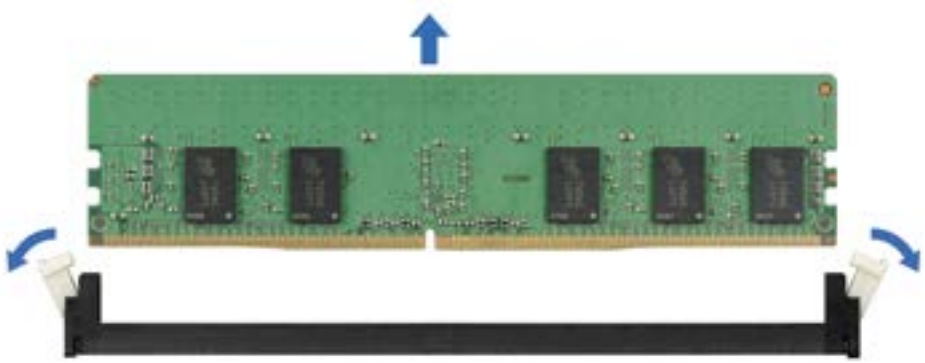

Figure 73. Removing a memory module

Next steps

Replace the memory module.

Installing a memory module

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.

Locate the appropriate memory module socket.

NOTE: The procedure to remove a memory module blank is similar to the procedure to remove a memory module. Retain the removed memory module blank for future use.

Steps

1. Open the ejectors on the memory module socket outward to allow the memory module to be inserted into the socket.
2. 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: Handle each memory module only by the card edges, ensuring not to touch the middle of the memory module or metallic contacts.

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

3. Press the memory module with your thumbs until the ejectors firmly click into place.

   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.

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

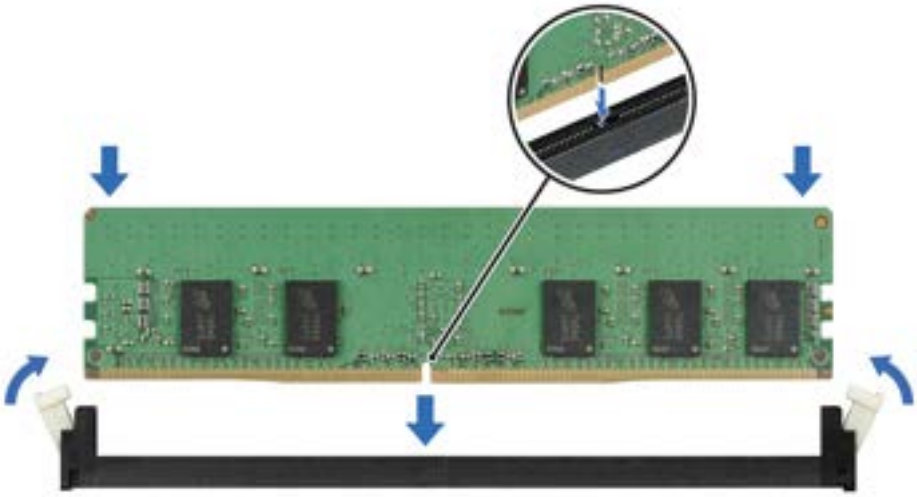

Figure 74. Installing a memory module

Next steps

1. Install the air shroud.
2. Install the system cover.
3. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
4. Open the drive bays, install all drives, and then close the drive bays.
5. Install the power supply units.
6. Follow the procedure listed in After working inside your system.
7. To verify if the memory module has been installed properly, press F2 and navigate to **System Setup Main Menu > System BIOS > Memory Settings**. In the **Memory Settings** screen, the System Memory Size must reflect the updated capacity of the installed memory.
8. If the value is incorrect, one or more of the memory modules may not be installed properly. Ensure that the memory module is firmly seated in the memory module socket.
9. Run the system memory test in system diagnostics.

Processor and heat sink

Removing a processor and heat sink module

Prerequisites

WARNING: The heat sink may remain hot to touch for some time after the system is powered down. Allow the heat sink to cool before removing it.

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. If installed, remove the rear drive cage.
10. If installed, remove the risers.

Steps

1. Using a Torx #T30 screwdriver, loosen the screws on the heat sink in the order below:
   a. Loosen the first screw three turns.
   b. Loosen the second screw completely.
   c. Return to the first screw and loosen it completely.
2. Pushing both blue retention clips simultaneously, lift the processor and heat sink module (PHM) processor and heat sink module.
3. Set the PHM aside with the processor side facing up.

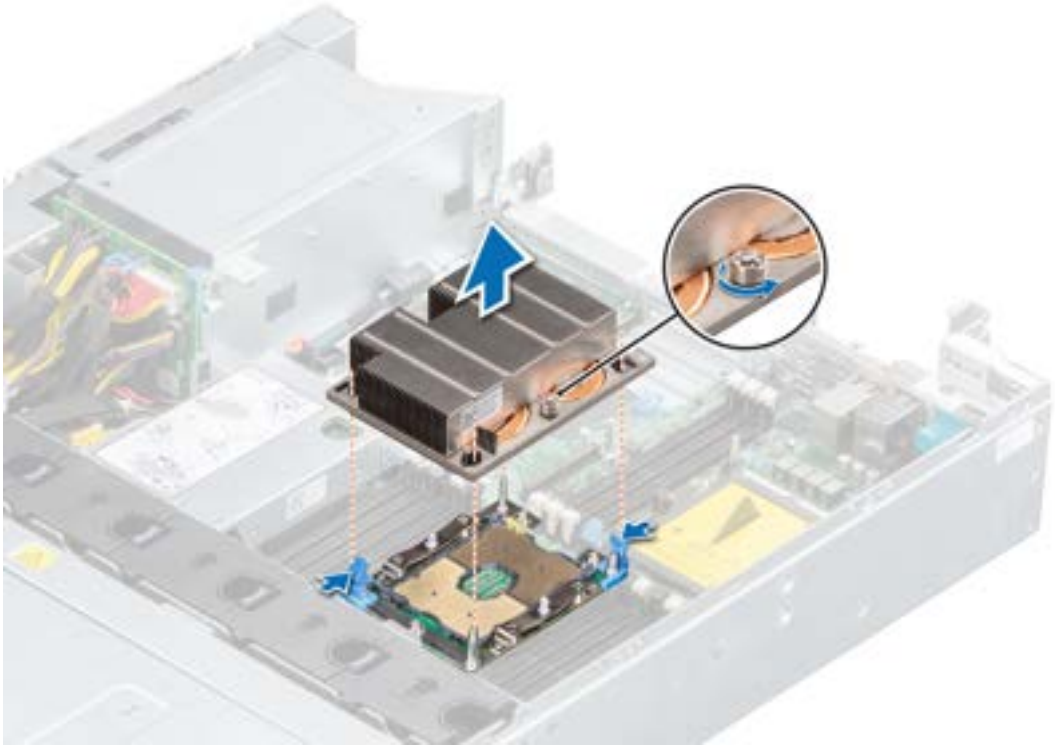

Figure 75. Removing a processor and heat sink module

Next steps

Replace a processor and heat sink module.

Removing the processor

Prerequisites

NOTE: Only remove the processor from the processor and heat sink module if you are replacing the processor or heat sink. This procedure is not required when replacing a system board.

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. If installed, remove the rear drive cage.
10. If installed, remove the risers.
11. Remove a processor and heat sink module.

Steps

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

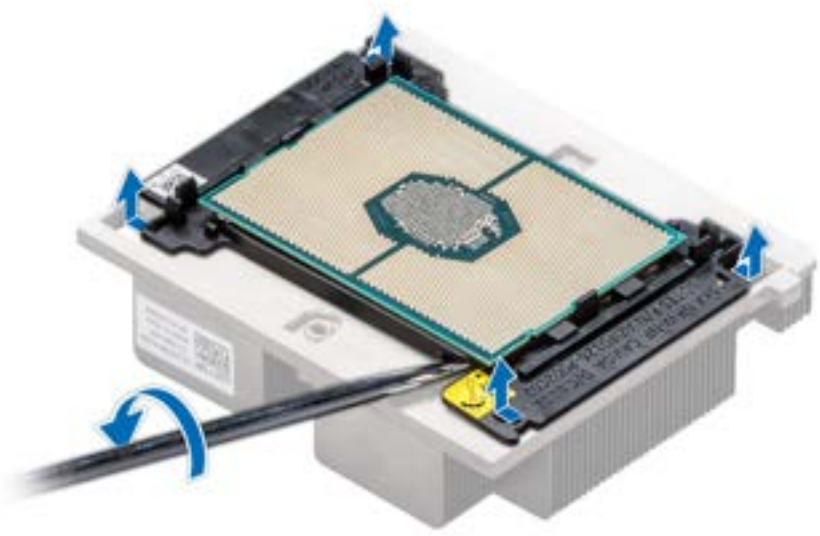

Figure 76. Loosening the processor bracket

4. Lift the processor bracket away from the heat sink, and place the processor connector side down on the processor tray.
5. Flex the outer edges of the bracket to release the bracket from the processor.

NOTE: Ensure that the processor bracket is placed in the tray after you remove it from the heat sink.

Figure 77. Removing the processor bracket

Next steps

Replace the processor into a processor and heat sink module.

Installing the processor

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. If installed, remove the rear drive cage.
11. If installed, remove the risers.
12. Remove a processor and heat sink module.

Steps

1. Place the processor in the processor tray with the connector side facing down.

   NOTE: Ensure that the pin 1 indicator on the processor tray is aligned with the pin 1 indicator on the processor.

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

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

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

Figure 78. Installing the processor bracket

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

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

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

Figure 79. Applying thermal grease on top of the processor

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

   NOTE:

   - Ensure that the two guide pin holes on the bracket match the guide holes on the heat sink.

- Do not press on the heat sink fins.
- Ensure that the pin 1 indicator on the heat sink is aligned with the pin 1 indicator on the bracket before placing the heat sink onto the processor bracket.

Figure 80. Installing the heat sink onto the processor

Next steps

1. Install the processor and heatsink.
2. If removed, install the risers.
3. If removed, install the rear drive cage.
4. Install the air shroud.
5. Install the system cover.
6. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Open the drive bays, install all drives, and then close the drive bays.
8. Install the power supply units.
9. Follow the procedure listed in After working inside your system.

Installing a processor and heat sink module

Prerequisites

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

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.

4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. If installed, remove the rear drive cage.
11. If installed, remove the risers.
12. If installed, remove the processor dust cover.

Steps

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

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

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

2. Push the blue retention clips inward to allow the heat sink to be lowered into place.
3. Using the Torx #T30 screwdriver, tighten the screws on the heat sink in the order below:
   a. Partially tighten the first screw (approximately 3 turns).
   b. Tighten the second screw completely.
   c. Return to the first screw and tighten it completely.

   If the PHM slips off the blue retention clips when the screws are partially tightened, follow these steps to secure the PHM:
   a. Loosen both the heat sink screws completely.
   b. Lower the PHM on to the blue retention clips, following the procedure described in step 2.
   c. Secure the PHM to the system board, following the replacement instructions listed in step 3.

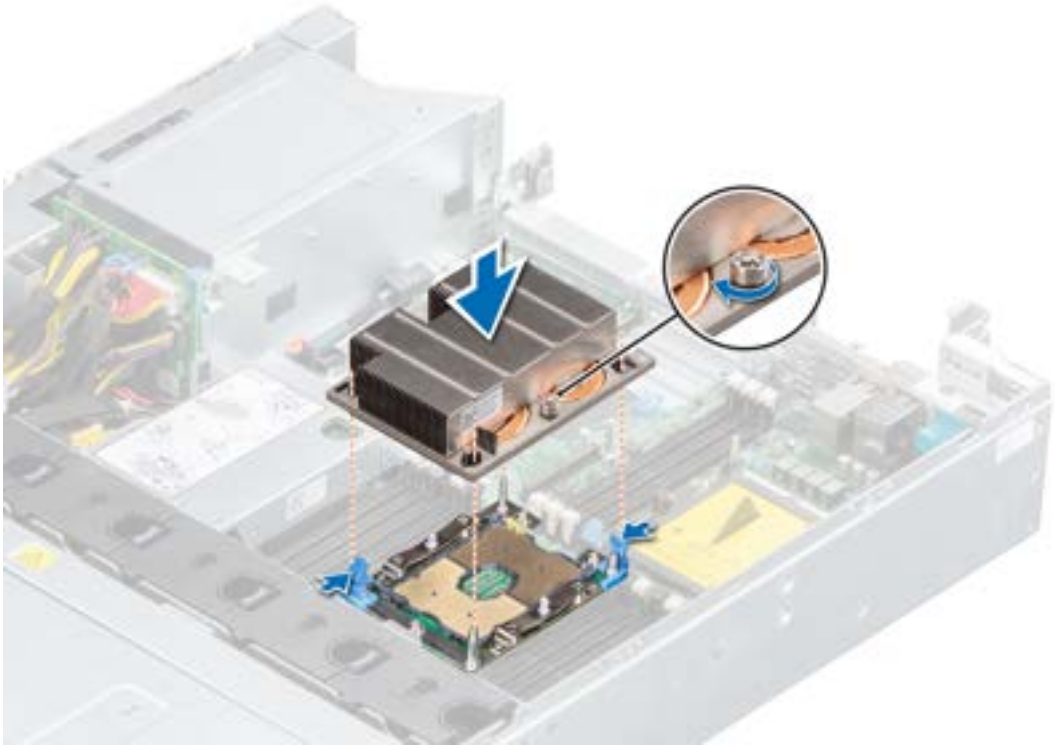

Figure 81. Installing the processor and heat sink module

Next steps

1. If removed, install the risers.
2. If removed, install the rear drive cage.
3. Install the air shroud.
4. Install the system cover.
5. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
6. Open the drive bays, install all drives, and then close the drive bays.
7. Install the power supply units.
8. Follow the procedure listed in After working inside your system.

Expansion cards and expansion card risers

NOTE: A System Event Log (SEL) event is logged if an expansion card riser is not supported or missing. It does not prevent your system from turning on. However, if a F1/F2 pause occurs with an error message, see *Troubleshooting expansion cards* section in the *Dell EMC PowerEdge Servers Troubleshooting Guide* at www.dell.com/poweredgemanuals.

Expansion card installation guidelines

The following table provides guidelines for installing expansion cards to ensure proper cooling and mechanical fit. The expansion cards with the highest priority should be installed first using the slot priority indicated. All the other expansion cards should be installed in the card priority and slot priority order.

Table 9. Riser configurations: System without riser - Processor 1

Card Type	Slot Priority	Maximum number of cards
LOM riser ; 2x1G BCM5720L (FXN)	1	1
PCIe SSD PCIe Card (Samsung)	5	1
Card (Broadcom/INTEL/Mellanox/ Solarflare/QLOGIC)	5	1
BOSS M.2 (SATA) (Dell)	5	1
1G Card,Network (Broadcom/INTEL)	6, 5	2
Internal PERC, PERC9/9.14G (FXN)	Integrated Slot	1
External PERC, PERC9/9.14G/10	5	1
PERC11 HBA355e (External)	5	1
PERC11 HBA350i,MMLP-B (Internal)	Integrated Slot	1
Mellanox 25G Dual Port FH	NA	0
Mellanox 25G Dual Port LP	5	1
Broadcom 25G Quad Port FH	NA	0
Broadcom 100G Dual Port FH	NA	0
Broadcom 100G Dual Port LP	NA	0

Table 10. Riser configurations: System without riser - Processor 2

Card type	Slot priority	Maximum number of cards
LOM riser ; 2x1G BCM5720L (FXN)	1	1
Cards (Broadcom/INTEL/Mellanox/ Qlogic Dual Port 10G SFP card)	4, 5	2

Table 10. Riser configurations: System without riser - Processor 2 (continued)

Card type	Slot priority	Maximum number of cards
Card (Qlogic Dual Port card, 10G BT/25G SFP)	5	2
BOSS M.2 (SATA) (Dell)	4, 5	2
1G Card,Network (Broadcom/INTEL)	6, 5, 4	3
Internal PERC, PERC9/9.14G (FXN)	Integrated Slot	1
External PERC, PERC 9/9.14G/10	4, 5	2
PCIe SSD PCIe Card (Samsung)	4, 5	2
Mellanox 100G CX5 Dual Port	4	1
PERC11 HBA355e (External)	4, 5	2
PERC11 HBA350i,MMLP-B (Internal)	Integrated Slot	1
Mellanox 25G Dual Port FH	NA	0
Mellanox 25G Dual Port LP	4, 5	2
Broadcom 25G Quad Port FH	NA	0
Broadcom 100G Dual Port FH	NA	0
Broadcom 100G Dual Port LP	4	1

Table 11. Riser configurations: Full height riser - Processor 1 and 2

Card type	Slot priority	Maximum number of cards
LOM riser ; 2x1G BCM5720L (FXN)	1	1
LOM riser ; 2x10G BCM57416 (BASeT/ SFP+)	1	1
LOM riser: Broadcom 25G card, 930PP	1	1
PERC 9/9.14G/10 (external)	2	1
PERC 9/9.14G (Internal)	2	1
Cards (Broadcom/INTEL/Mellanox/ Solarflare/QLOGIC)	2	1
BOSS M.2 (SATA) (Dell)	2	1
PERC 9/9.14G (Internal)	Integrated Slot	1
PERC11 HBA355e (External)	2	1
PERC11 HBA350i,MMLP-B (Internal)	Integrated Slot	1
Mellanox 25G Dual Port FH	2	1
Mellanox 25G Dual Port LP	NA	0
Broadcom 25G Quad Port FH	2	1
Broadcom 100G Dual Port FH	2	1
Broadcom 100G Dual Port LP	NA	0

Table 12. Riser configurations: Low profile (Riser 1) + Low profile (Riser 2) - Processor 1 and 2

Card type	Slot priority	Maximum number of cards
LOM riser ; 2x1G BCM5720L	1	1

Table 12. Riser configurations: Low profile (Riser 1) + Low profile (Riser 2) - Processor 1 and 2 (continued)

Card type	Slot priority	Maximum number of cards
LOM riser ; 2x10G BCM57416 (BASeT/ SFP+)	1	1
LOM riser: Broadcom 25G card, 930PP	1	1
PCIe SSD PCIe Card (Samsung)	3, 2	2
Cards (Broadcom/INTEL/Mellanox/ Solarflare/QLOGIC)	3, 2	2
BOSS M.2 (SATA) (Dell)	3, 2	2
PERC 9/9.14G (Internal)	Integrated Slot	1
RAID - PERC9/9.14G (Internal) (Dell)	3	1
PERC9/9.14G/10 (External)	3, 2	2
PERC11 HBA355e (External)	3, 2	2
PERC11 HBA350i,MMLP-B (Internal)	Integrated Slot	1
Mellanox 25G Dual Port FH	NA	0
Mellanox 25G Dual Port LP	3, 2	2
Broadcom 25G Quad Port FH	NA	0
Broadcom 100G Dual Port FH	NA	0
Broadcom 100G Dual Port LP	3, 2	2

Table 13. Riser configurations: Butterfly riser + 3 x low profile - Processor 1

Card type	Slot priority	Maximum number of cards
LOM riser ; 2x1G BCM5720L	1	1
LOM riser ; 2x10G BCM57416 (BASeT/ SFP+)	1	1
LOM riser: Broadcom 25G card, 930PP	1	1
RAID - PERC 9/9.14G/10 (External) (Dell)	2, 3, 5	3
Full Height (FH) Card Network, (Broadcom/Intel/Mellanox/Qlogic)	2	1
BOSS M.2 (SATA) (Dell)	2	1
PCIe SSD PCIe Card (Samsung)	3, 5, 2	3
Low Profile LP card 10G, 25G, 40G (Broadcom/Intel/Mellanox/Qlogic Dual Port/Solarflare	3, 5	2
BOSS M.2 (SATA) (Dell)	3, 5	2
1G Card,Network (Broadcom/INTEL)	6, 5, 3	3
PERC 9/9.14G (Internal)	Integrated Slot	1
Qlogic Qual Port LP card	3	1
40G LP card (Intel/mellanox)	3	NA
PCIe SSD PCIe card (Intel)	3	1
PERC11 HBA355e (External)	3, 2, 5	2

Table 13. Riser configurations: Butterfly riser + 3 x low profile - Processor 1 (continued)

Card type	Slot priority	Maximum number of cards
PERC11 HBA350i,MMLP-B (Internal)	Integrated Slot	1
Mellanox 25G Dual Port FH	2	1
Mellanox 25G Dual Port LP	3, 5	2
Broadcom 25G Quad Port FH	2	1
Broadcom 100G Dual Port FH	2	1
Broadcom 100G Dual Port LP	NA	0

Table 14. Riser configurations: Butterfly riser + 3 x low profile - Processor 1 and 2

Card type	Slot priority	Maximum number of cards
LOM riser ; 2x1G BCM5720L (FXN)	1	1
LOM riser ; 2x10G BCM57416 (BASeT/ SFP+) (FXN)	1	1
LOM riser: Broadcom 25G card, 930PP	1	1
RAID - PERC 9/9.14G/10 (External)	4, 3, 2, 5	4
Full Height (FH) Card Network, (Broadcom/Intel/Mellanox 10G, 25G, 100G/Qlogic DP & QP 10GSEP)	2	1
BOSS M.2 (SATA) (Dell)	2	1
PCIe SSD PCIe Card (Samsung)	4, 3, 5, 2	4
Low Profile LP card 10G, 25G, 40G (Broadcom/Intel/Mellanox/Qlogic Dual Port/Solarflare)	4, 3, 5	4
BOSS M.2 (SATA) (Dell)	4, 3, 5	3
1G Card, Network (Broadcom/INTEL)	6, 5, 4, 3	4
RAID - PERC 9/9.14G (Internal)	Integrated Slot	1
100G LP card (Mellanox)	4	1
Qlogic Qual Port LP card	4, 3	2
40G LP card(Intel/mellanox)	4,3	NA
PCIe SSD PCIe card (Intel)	3	1
PERC11 HBA355e (External)	4, 3, 2, 5	2
PERC11 HBA350i,MMLP-B (Internal)	Integrated Slot	1
Mellanox 25G Dual Port FH	2	1
Mellanox 25G Dual Port LP	4, 3, 5	3
Broadcom 25G Quad Port FH	2	1
Broadcom 100G Dual Port FH	2	1
Broadcom 100G Dual Port LP	4	1

Removing expansion card from the system board

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the air shroud.
8. If installed, remove the rear drive cage.
9. If installed, remove the expansion card risers.
10. If applicable, disconnect any cables connected to the expansion card.

Steps

1. Press and lift up the expansion card retention latch to open.
2. Hold the expansion card by the edges and lift the card to disconnect it from the system board connector.

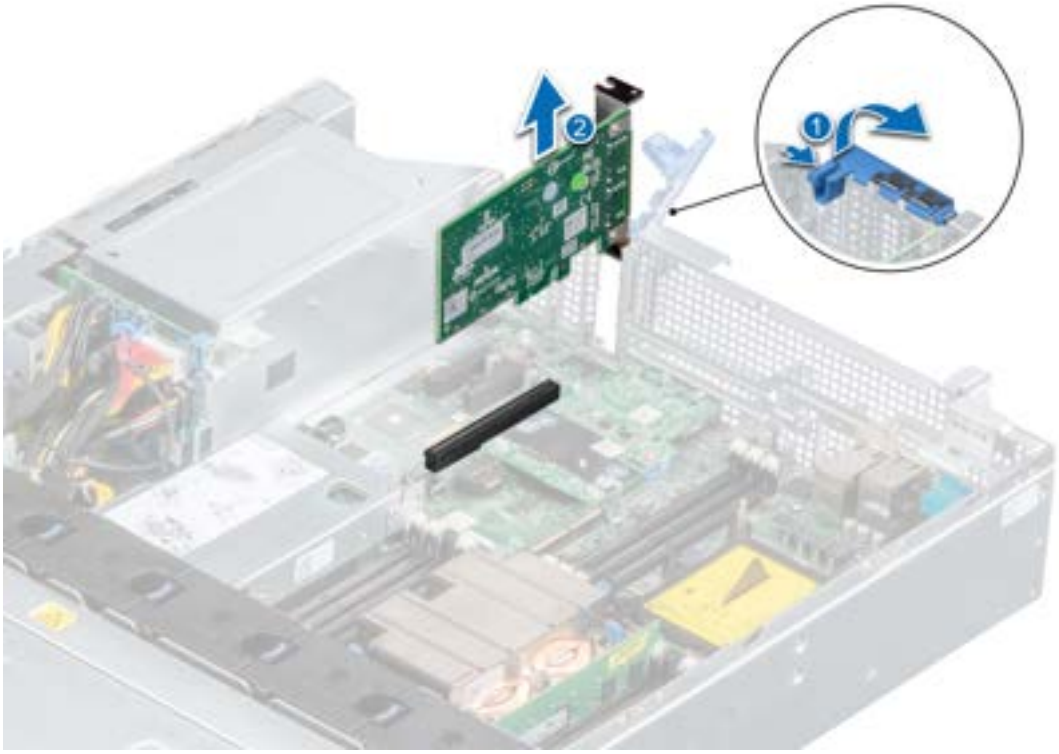

Figure 82. Removing expansion card from system board

3. If the expansion card is not going to be replaced, install a filler bracket by performing the following steps:
   a. Align the filler bracket with the slot on the system.
   b. Push the filler bracket downward until firmly seated.
   c. Close the retention latch by pressing the latch down until the latch snaps into place.

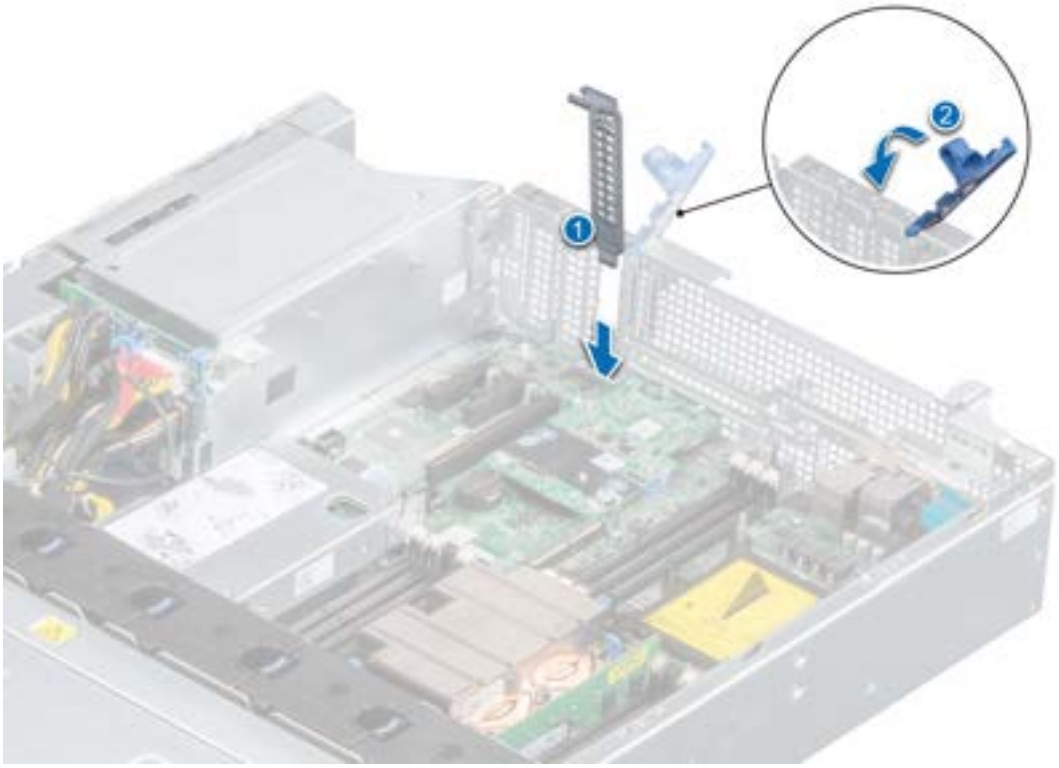

Figure 83. Installing the filler bracket

NOTE: Filler brackets must be installed over empty expansion card slots to maintain FCC certification of the system. The brackets also keep dust out of the system and aid in proper cooling and airflow inside the system.

Next steps

1. Replace the expansion card on the system board.

Removing expansion card from the expansion card riser

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. If installed, remove the rear drive cage.
10. Remove the expansion card riser from the system.
11. When removing a card from low profile, full height X1, or butterfly riser, ensure that the PCIe card holder latch is closed.

Steps

1. Open the expansion card retention latch.
2. Hold the expansion card by its edges, and pull the card away from the expansion card connector on the riser.

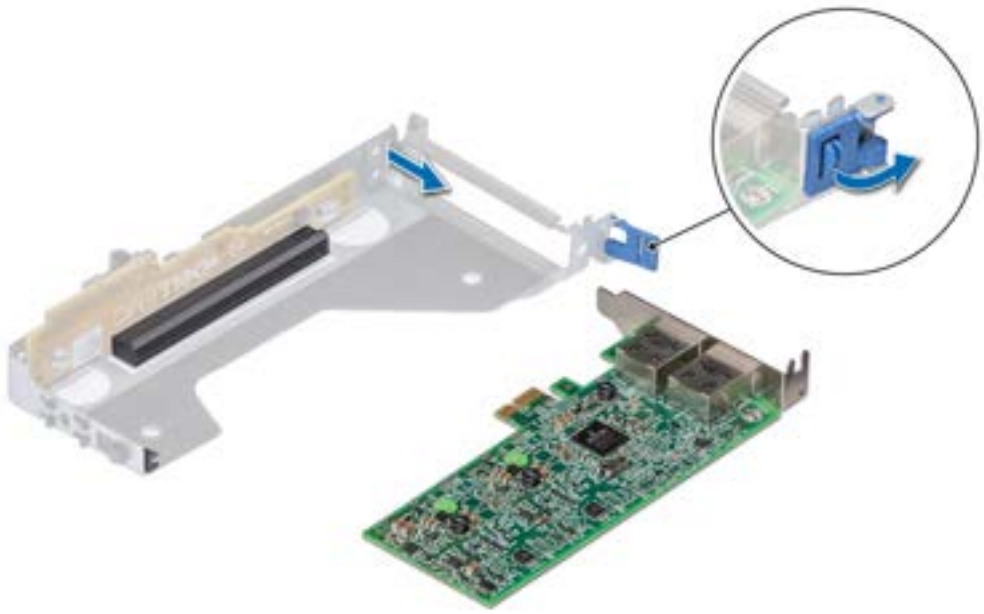

Figure 84. Removing expansion card from low profile riser

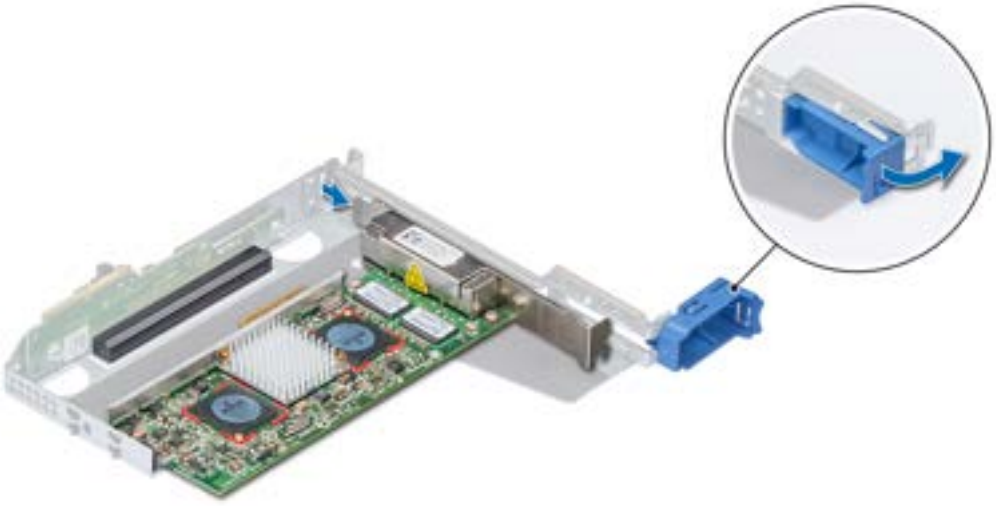

Figure 85. Removing expansion card from full height X1 riser

Figure 86. Removing expansion card from butterfly riser

3. If the expansion card is not going to be replaced, install a filler bracket.

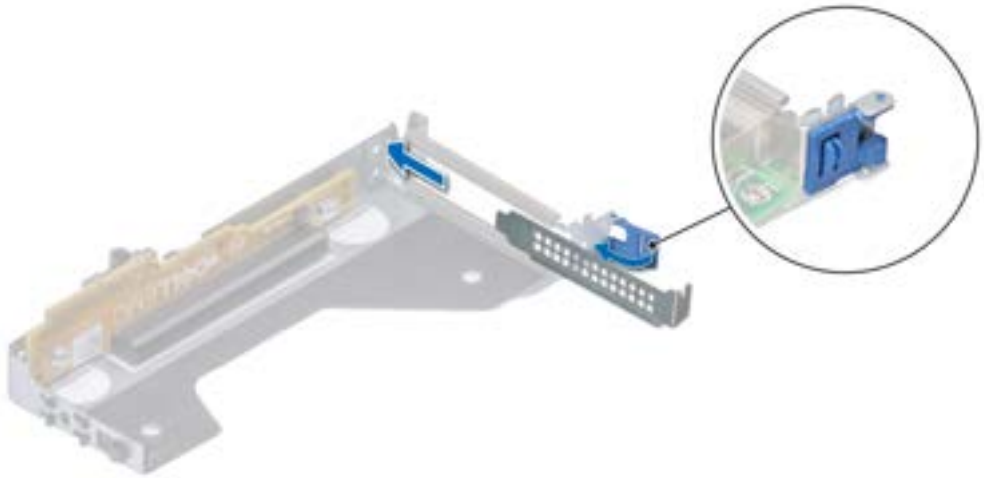

Figure 87. Installing filler bracket for low profile riser

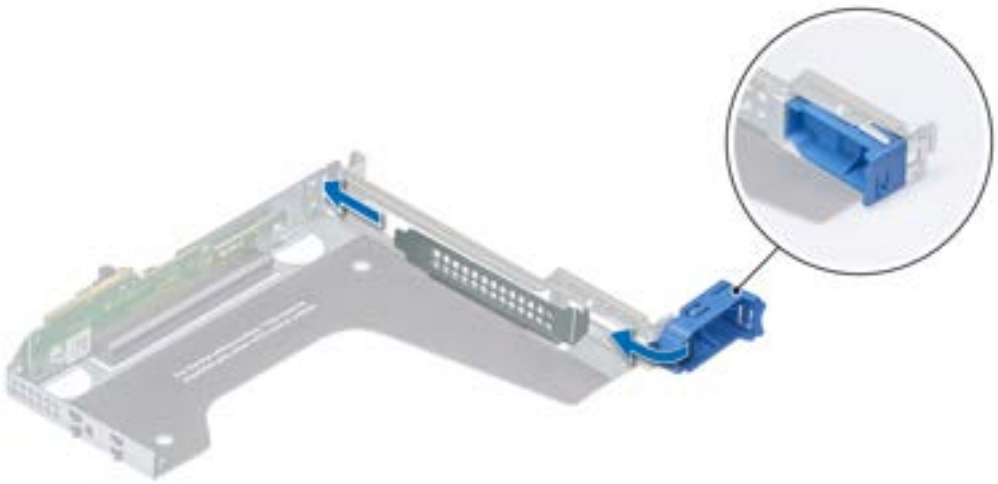

Figure 88. Installing filler bracket for full height X1 riser

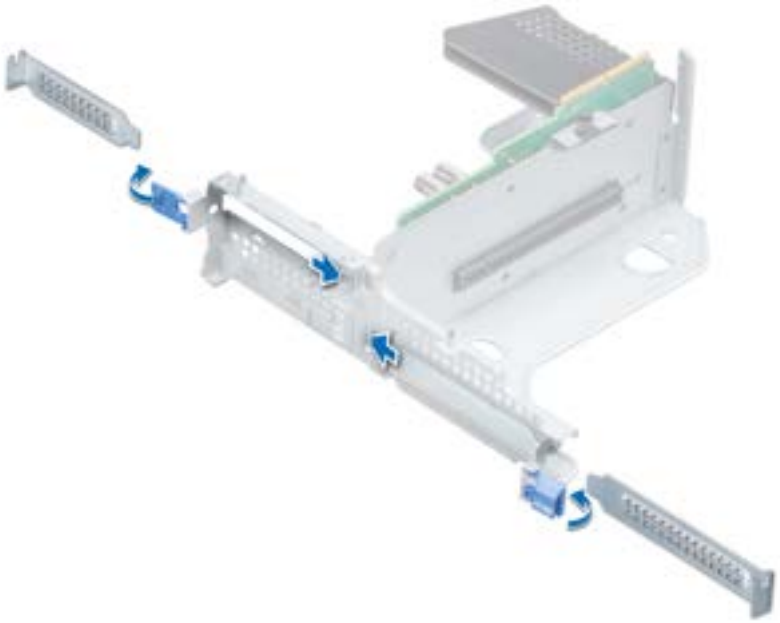

Figure 89. Installing filler bracket for butterfly riser

Next steps

1. Replace expansion card into the expansion card riser.
2. If you are removing the card permanently, install a metal filler bracket over the empty expansion slot opening and push the expansion card latch.

NOTE: You must install a filler bracket over an empty expansion card slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust out of the system and aid in proper cooling and airflow inside the system.

Installing expansion card into the expansion card riser

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. If installed, remove the rear drive cage.
11. Remove the expansion card riser from the system.
12. When removing a card from low profile, full height X1, or butterfly riser, ensure that the PCIe card holder latch is closed.
13. When installing a card into low profile, full height X1, or butterfly riser, open the PCIe card holder latch.
14. If installing a new expansion card, unpack it and prepare the card for installation.

NOTE: For instructions, see the documentation accompanying the card.

Steps

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

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

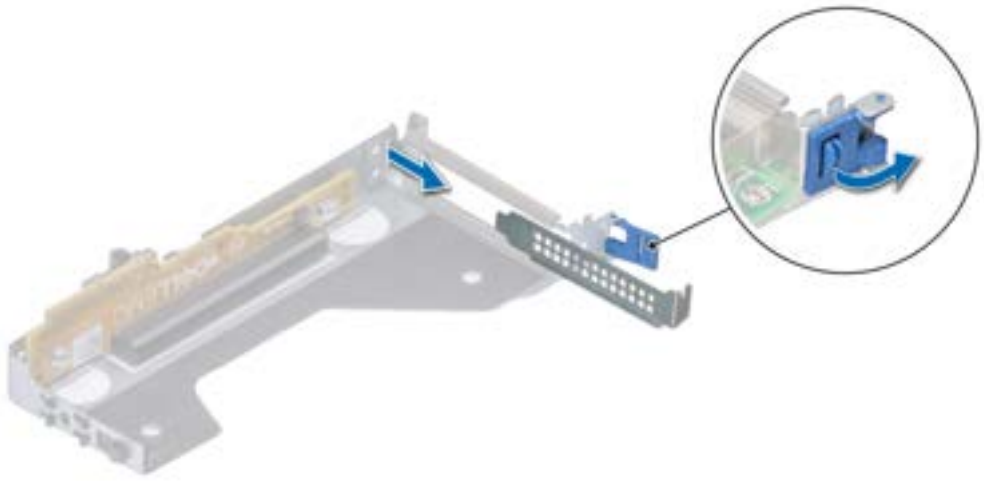

Figure 90. Removing filler bracket for low profile riser

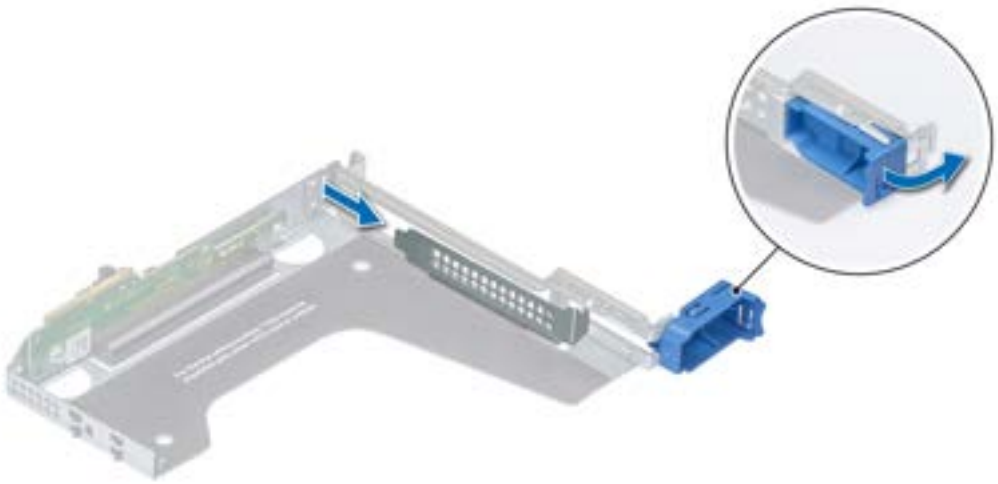

Figure 91. Removing filler bracket for full height X1 riser

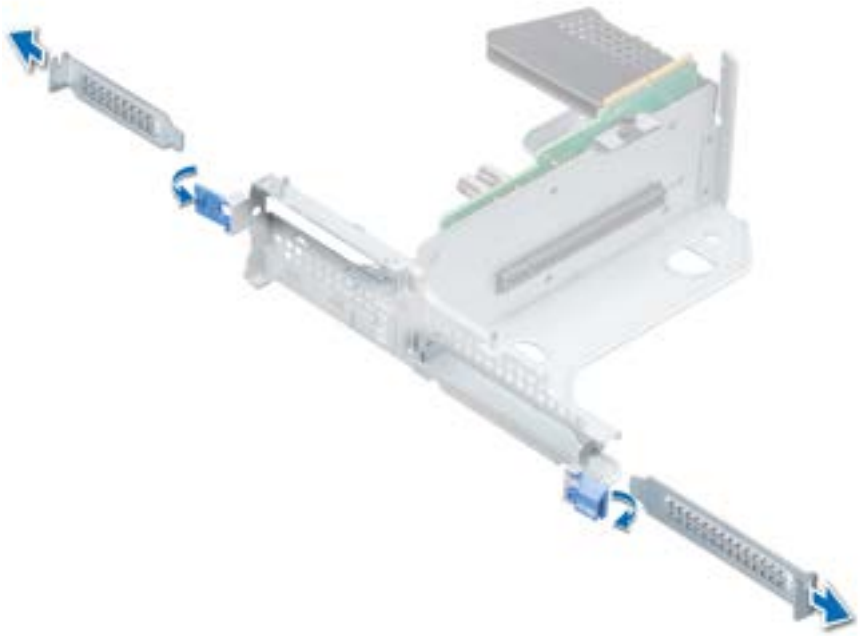

Figure 92. Removing filler bracket for butterfly riser

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

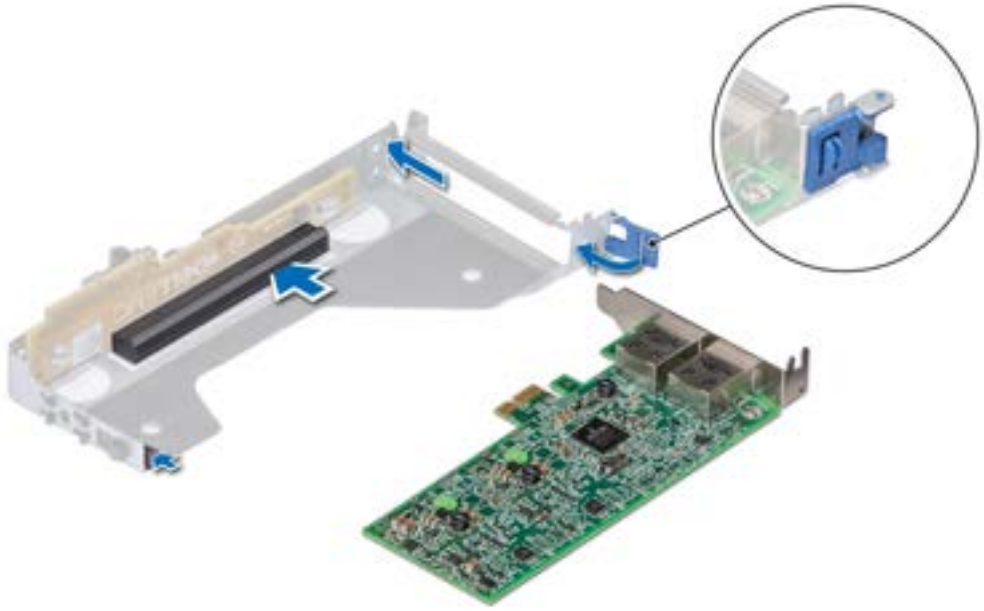

Figure 93. Installing expansion card into low profile riser

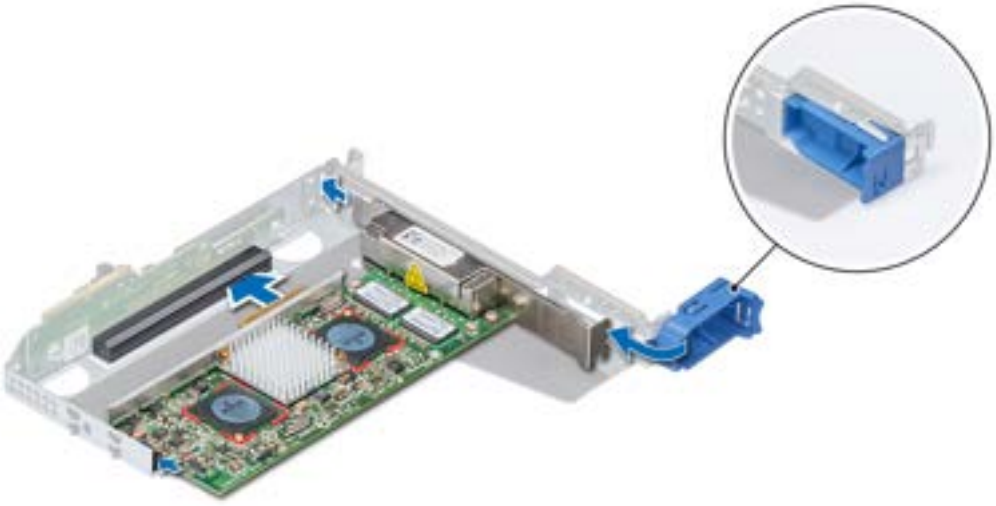

Figure 94. Installing expansion card into full height X1 riser

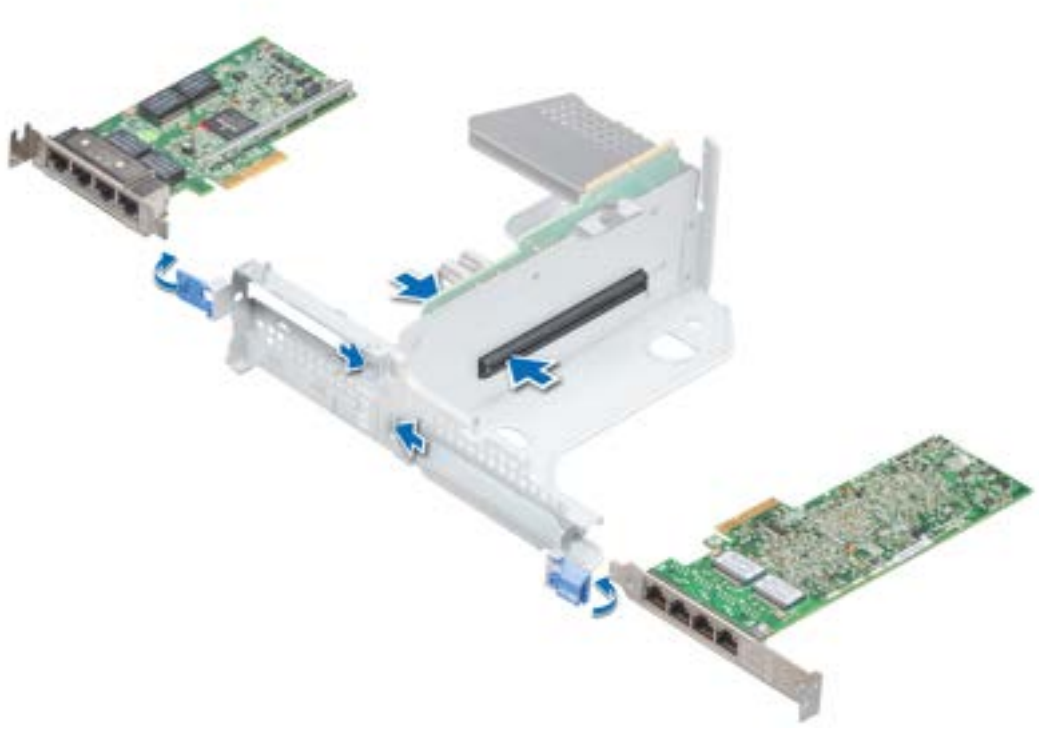

Figure 95. Installing expansion card into butterfly riser

Next steps

1. Install the expansion card riser in the system.
2. If applicable, connect the cables to the expansion card.
3. If removed, install the rear drive cage.
4. Install air shroud.
5. Install the system cover.
6. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Open the drive bays, install all drives, and then close the drive bays.
8. Install the power supply units.
9. Follow the procedure listed in After working inside your system.
10. Install any device drivers required for the card as described in the documentation for the card.

Installing expansion card on the system board

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. If installed, remove the rear drive cage.
11. If installed, remove the expansion card risers.

Steps

1. Unpack the expansion card and prepare it for installation.
   For instructions, see the documentation accompanying the card.
2. If you are installing a new card, remove the filler bracket.
   a. Press and lift the expansion card retention latch.
   b. Pull the filler bracket upward out of the system.

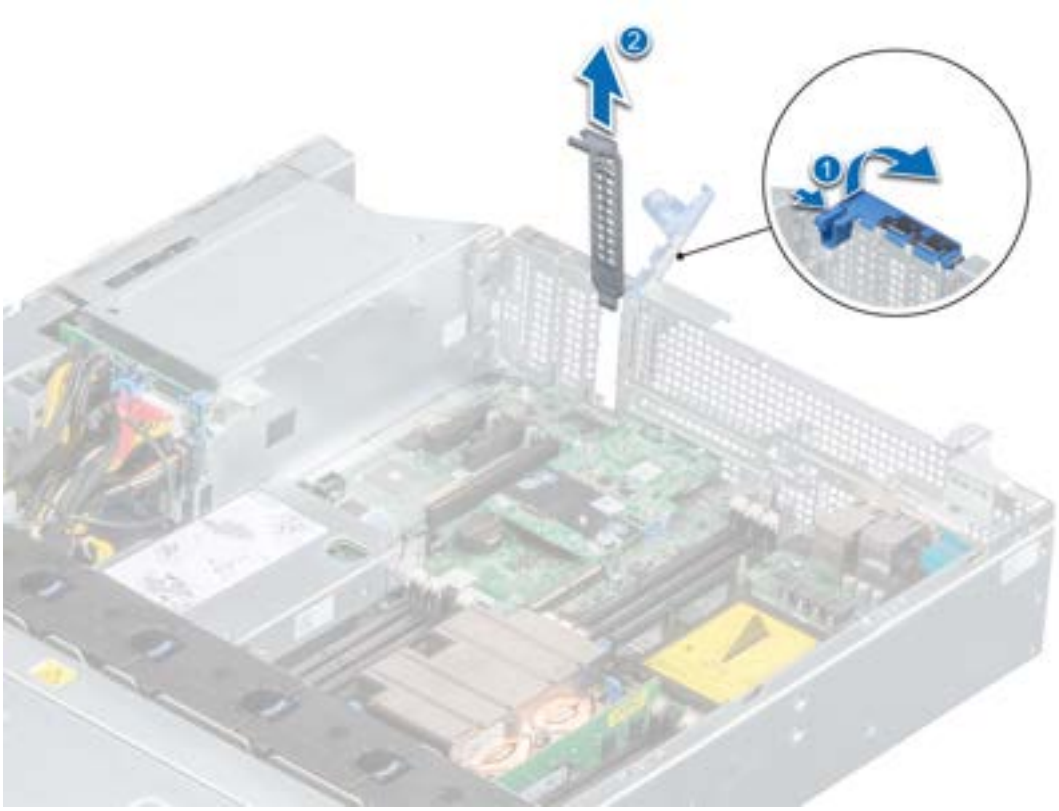

Figure 96. Removing the filler bracket

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

3. Holding the card on the edges, align the card with the expansion card connector on the system board.
4. Press the expansion card firmly into the expansion card connector on the system board until the card is fully seated.
5. Close the retention latch by pressing the latch down until the latch snaps into place.

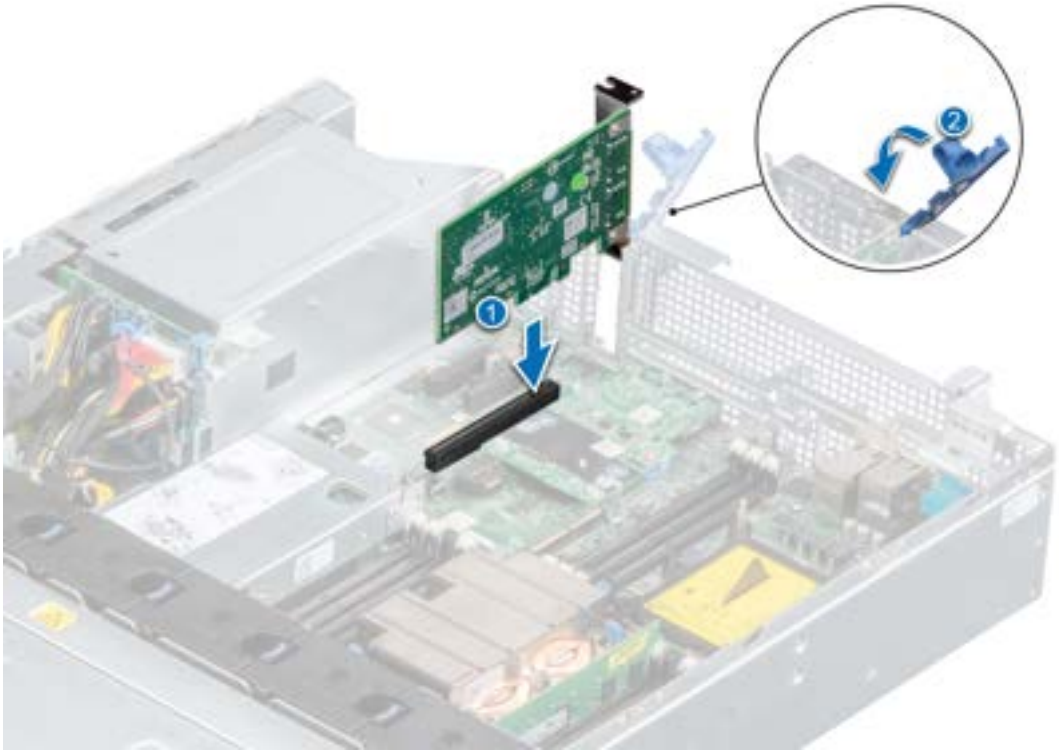

Figure 97. Installing expansion card on system board

Next steps

1. Connect the required cables to the expansion card.
2. If removed, install the rear drive cage.
3. Install air shroud.
4. Install the system cover.
5. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
6. Open the drive bays, install all drives, and then close the drive bays.
7. Install the power supply units.
8. Follow the procedure listed in After working inside your system.

Removing an expansion card riser

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. If installed, remove the rear drive cage.
10. Disconnect any cables connected to the expansion card.

Steps

Hold the touch points and lift the expansion card riser from the connector on the system board.

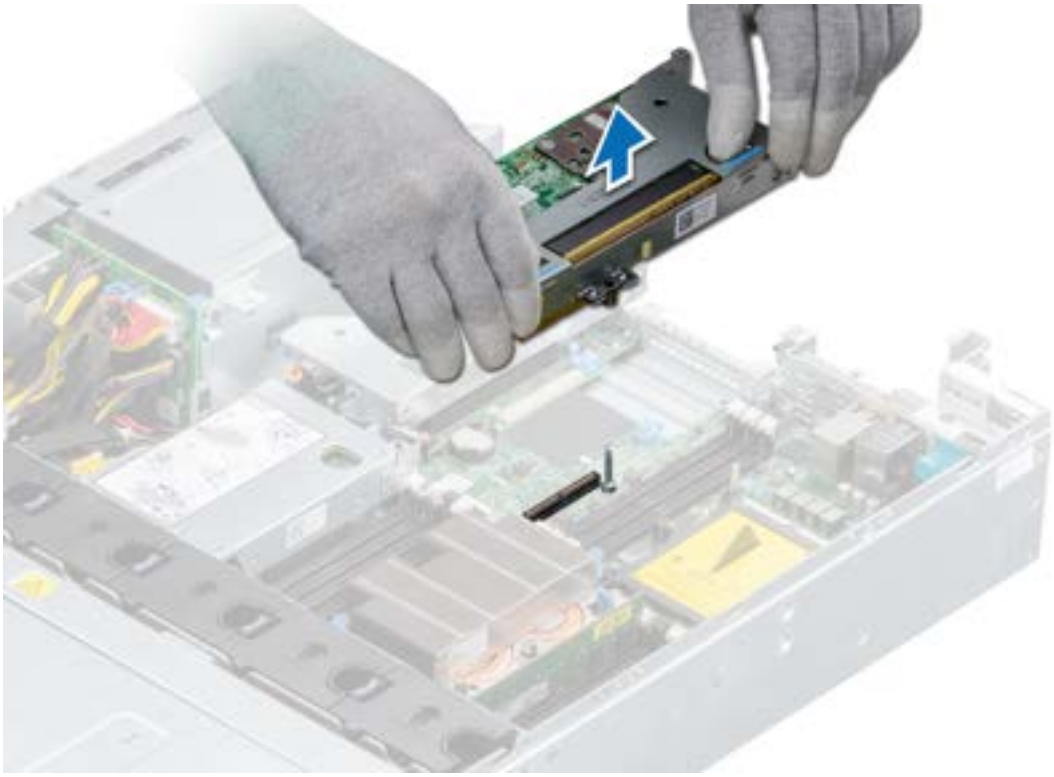

Figure 98. Removing right low profile riser

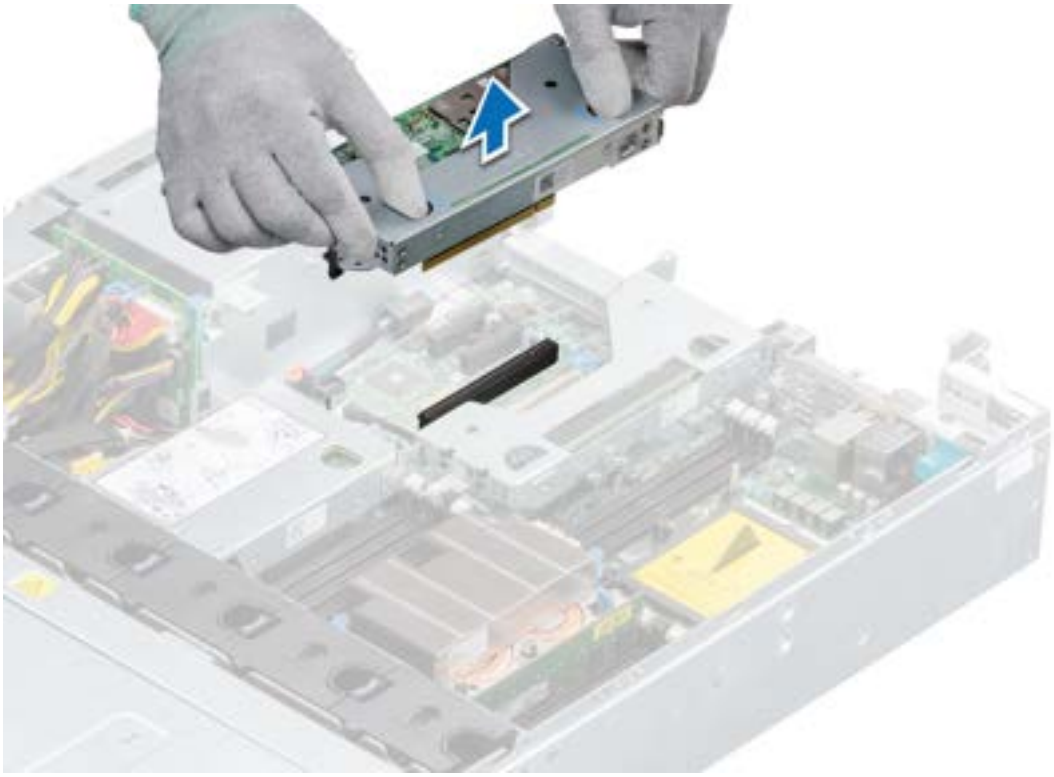

Figure 99. Removing left low profile riser

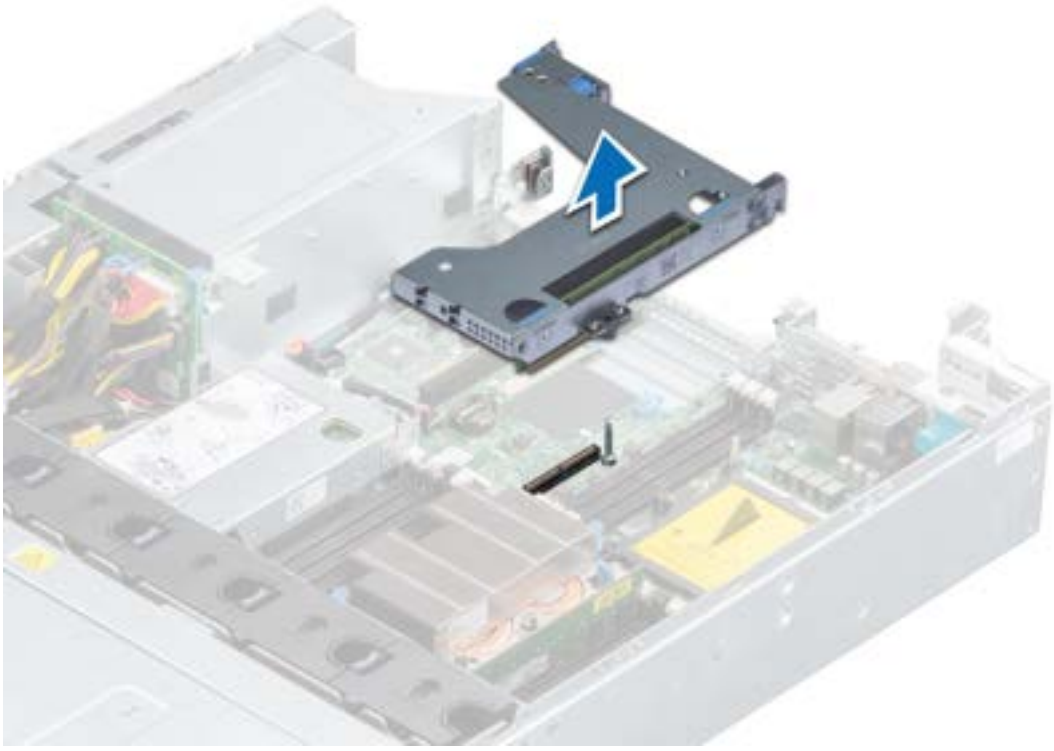

Figure 100. Removing full height X1 riser

NOTE: For butterfly riser, loosen the captive screw and holding the touch points lift the riser away from the system.

Figure 101. Removing butterfly riser

Next steps

Install the expansion card riser.

Installing an expansion card riser

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud .
10. If installed, remove the rear drive cage.

Steps

1. If removed, install the expansion cards into the expansion card riser.
2. Holding the touch points, align the expansion card riser with the connector and the riser guide pin on the system board.
3. Lower the expansion card riser into place until the expansion card riser connector is fully seated in the connector.

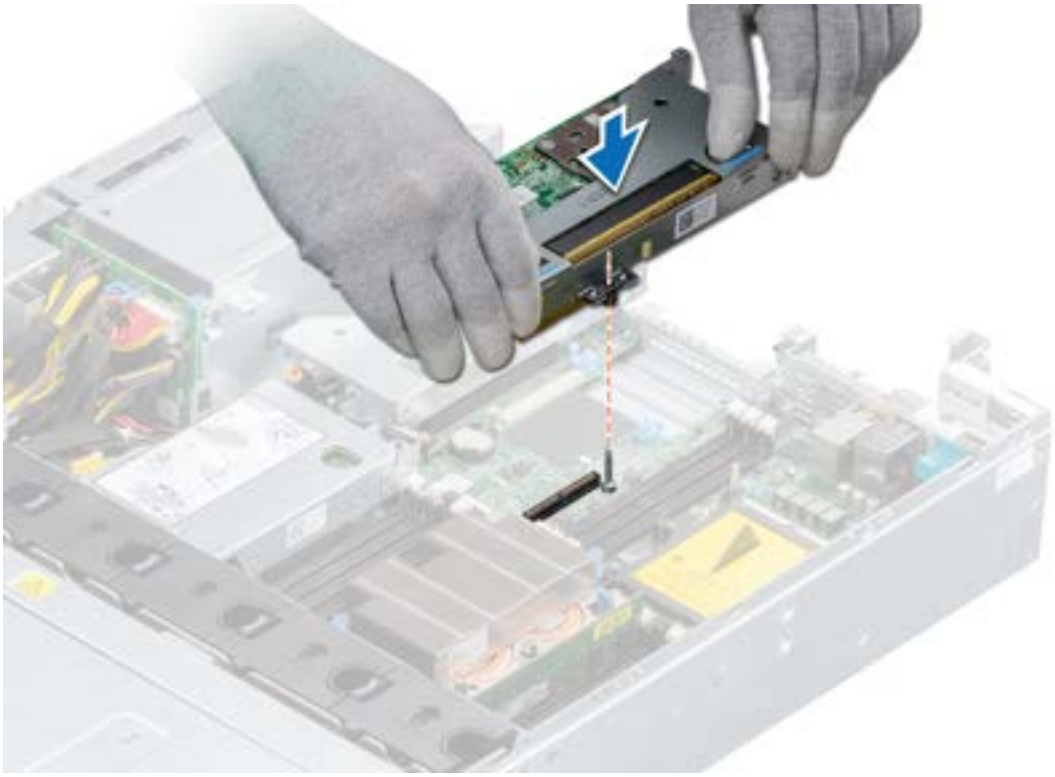

Figure 102. Installing right low profile riser

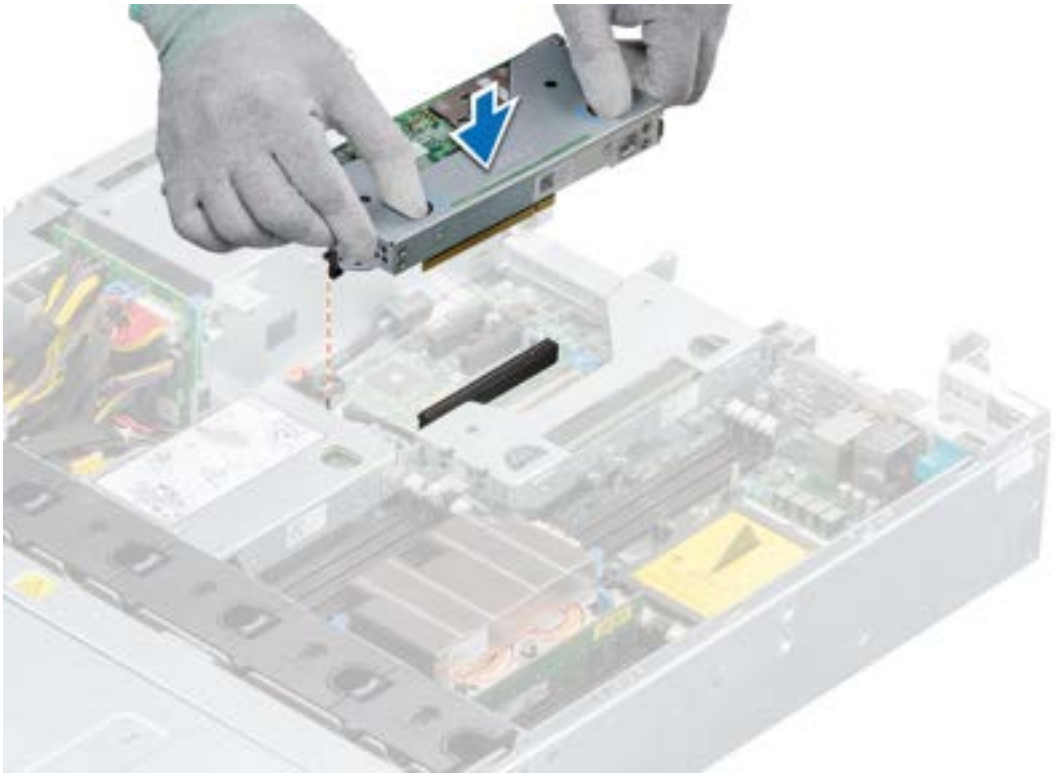

Figure 103. Installing left low profile riser

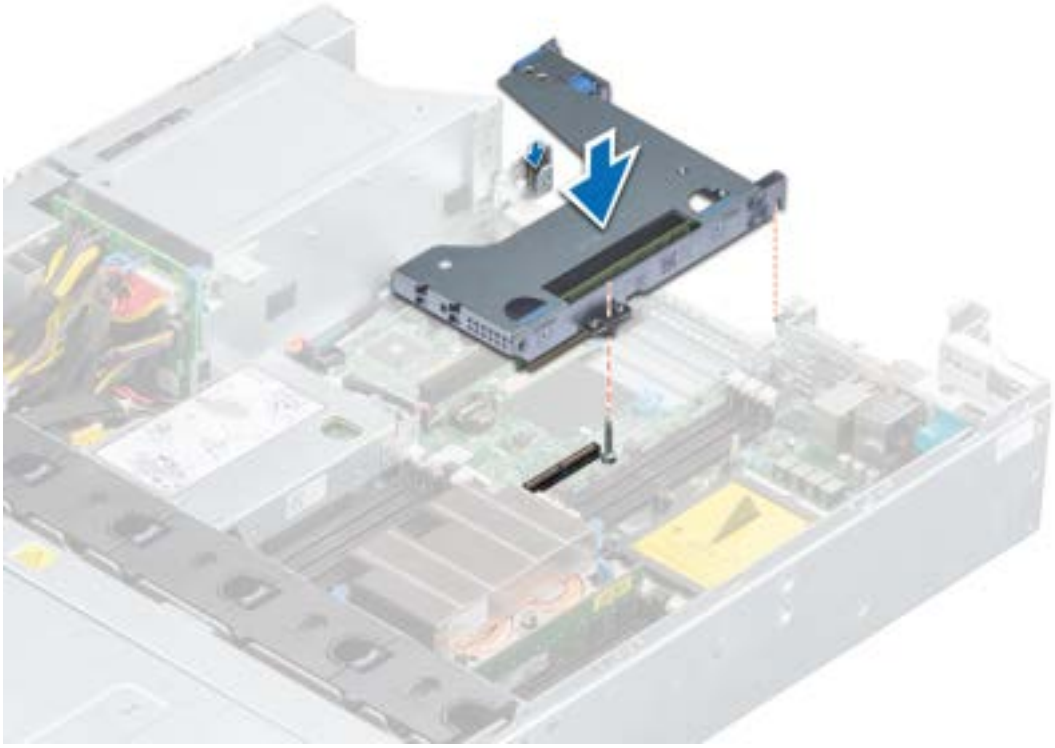

Figure 104. Installing full height X1 riser

NOTE: For butterfly riser, tighten the captive screw to firmly hold the riser to the system board.

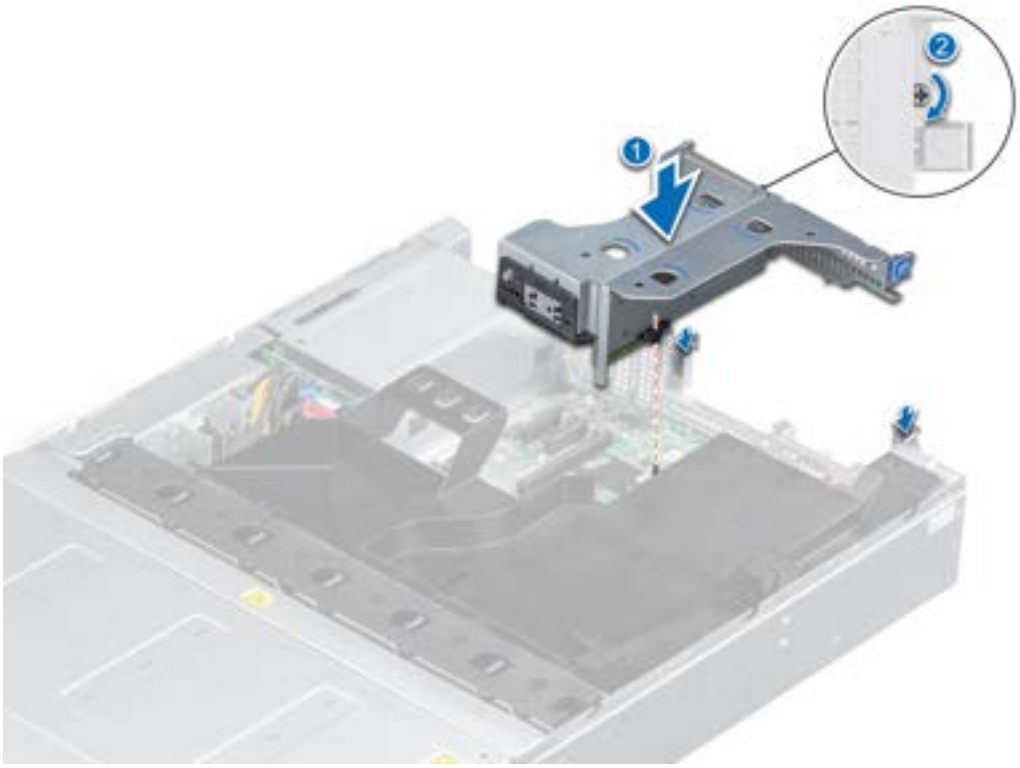

Figure 105. Installing butterfly riser

Next steps

1. If removed, install the rear drive cage.
2. Install the air shroud.
3. Install the system cover.
4. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. Install any device drivers required for the card as described in the documentation for the card.
8. Follow the procedure listed in After working inside your system.

M.2 SSD module

Removing the M.2 SSD module

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. If installed, remove the rear drive cage.

10. Remove the BOSS card.

NOTE: The procedure to remove the BOSS card is similar to the remove an expansion card.

Steps

1. Using the Phillips #1 screwdriver, remove the screws securing the M.2 SSD module to the BOSS card.
2. Pull the M.2 SSD module from the BOSS card connector.

Figure 106. Removing the M.2 SSD module

Next steps

Replace the M.2 SSD module.

Installing the M.2 SSD module

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. Remove the BOSS card.

NOTE: The procedure to remove the BOSS card is similar to the removing an expansion card.

Steps

1. Insert the M.2 SSD module at an angle into the BOSS card connector.
2. Push the other end of the M.2 SSD module until it rests on the stand off on the BOSS card.

3. Using the Phillips #1 screwdriver, secure the M.2 SSD module on the BOSS card with the screw.

Figure 107. Installing the M.2 SSD module

Next steps

1. Install the BOSS card.

   NOTE: The procedure to install the BOSS card is similar to the installing an expansion card on the system board.
2. Install the air shroud.
3. Install the system cover.
4. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. Follow the procedure listed in After working inside your system.

Optional IDSDM / vFlash module

The write-protect switch is on the IDSDM module.

Removing the IDSDM/vFlash module

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.

Steps

Holding the pull tab, lift the IDSDM/vFlash module out of the system board connector .

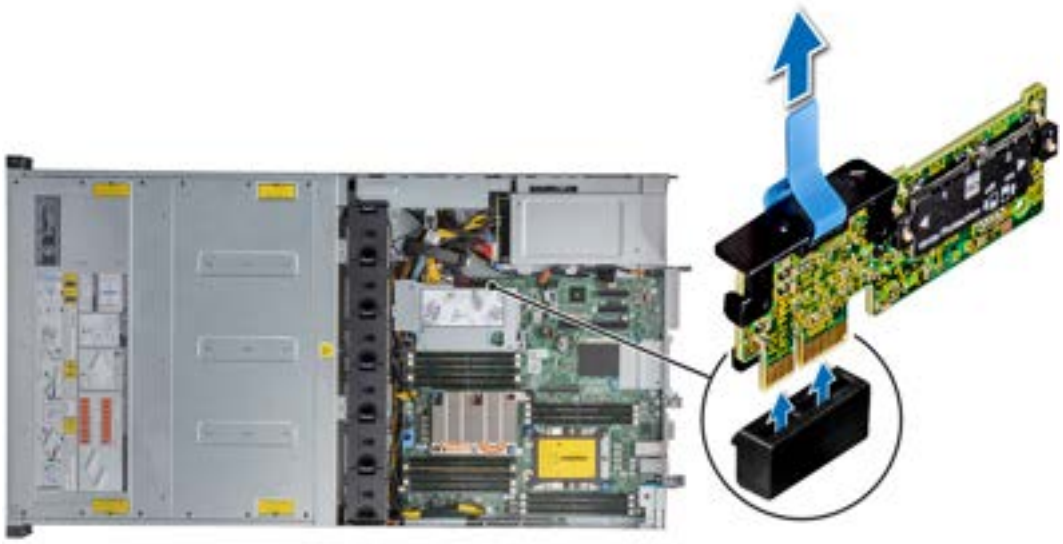

Figure 108. Removing the optional IDSDM or vFlash card

Next steps

NOTE: If you are replacing the IDSDM or vFlash module, remove the microSD cards.

Replace optional IDSDM/vFlash module.

Installing IDSDM/vFlash module

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud

Steps

Insert the IDSDM/vFlash module into the system board connector.

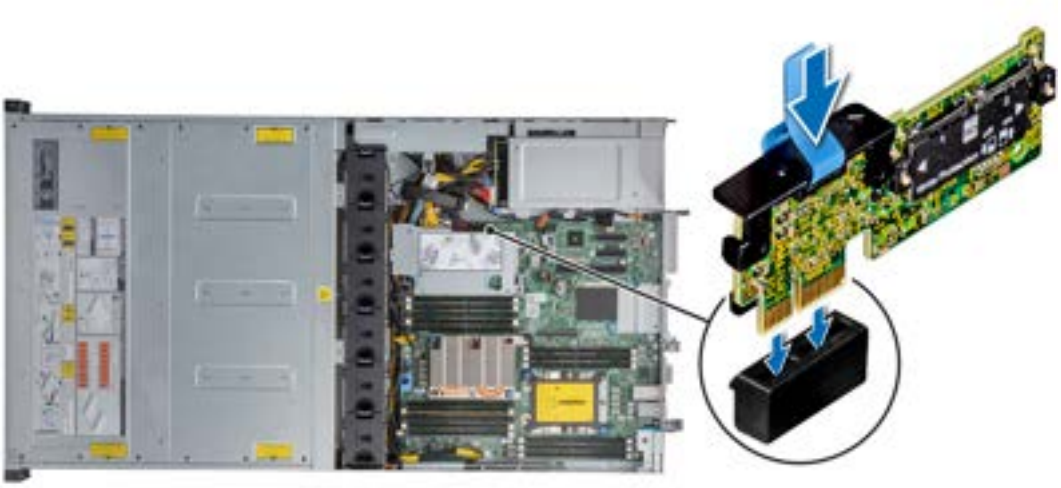

Figure 109. Installing optional IDSDM/vFlash card

Next steps

1. Install the MicroSD cards.

   NOTE: Reinstall the MicroSD cards into the same slots based on the labels you had marked on the cards during removal.
2. Install the air shroud.
3. Install the system cover.
4. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. Follow the procedure listed in After working inside your system.

Removing the MicroSD card

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. Remove the IDSDM or vFlash module.

Steps

1. Locate the MicroSD card slot on the IDSDM/vFlash module, and press the card to partially release it from the slot.
2. Hold the MicroSD card and remove it from the slot.

   NOTE: Temporarily label each MicroSD card with its corresponding slot number after removal.

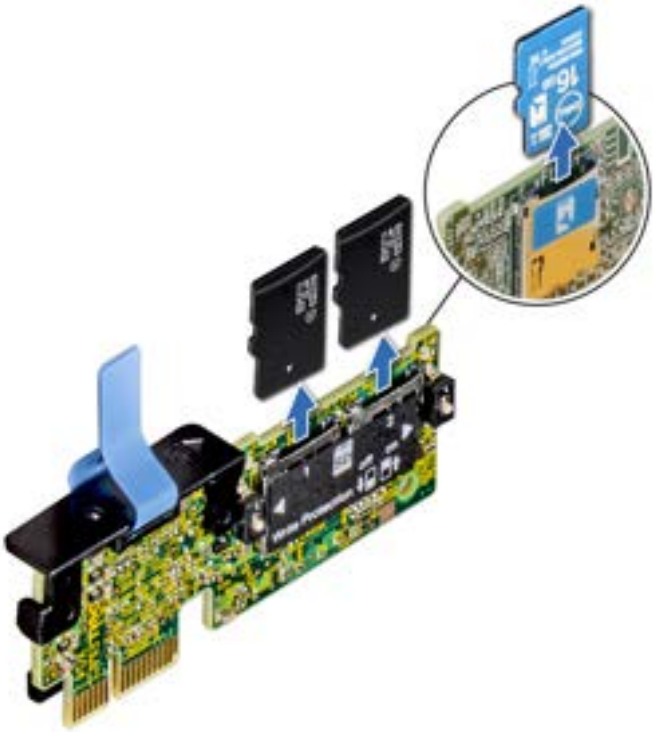

Figure 110. Removing the MicroSD card

Next steps

Replace the MicrosSD card.

Installing the MicroSD card

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. Remove the IDSDM or vFlash module.

NOTE: To use an MicroSD card with your system, ensure that the **Internal SD Card Port** is enabled in System Setup.

NOTE: If reinstalling, ensure that you install the MicroSD cards into the same slots based on the labels you had marked on the cards during removal.

Steps

1. Locate the MicroSD card connector on the IDSDM/vFlash module. Orient the MicroSD card appropriately and insert the contact-pin end of the card into the slot.

   NOTE: The slot is designed to ensure correct insertion of the card.

2. Press the card into the card slot to lock it into place.

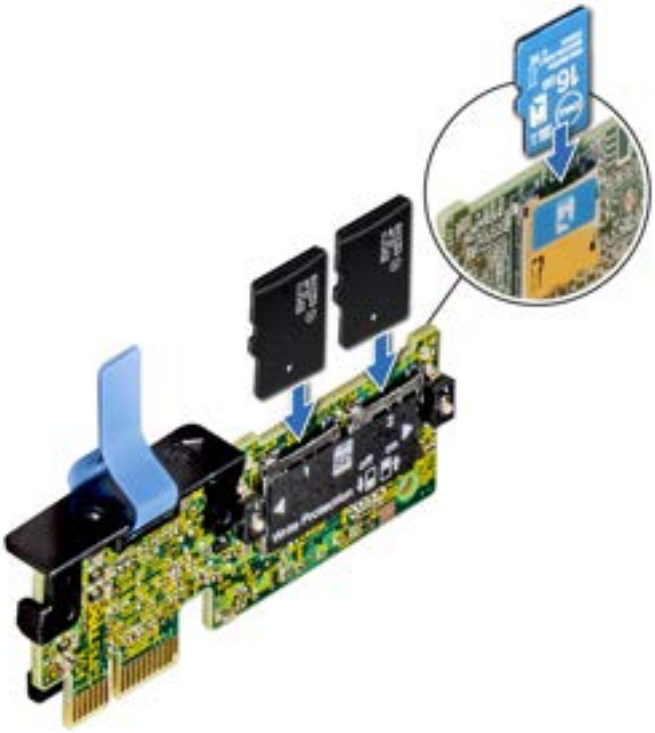

Figure 111. Installing the MicroSD card

Next steps

1. Install the IDSDM or vFlash module.
2. Install the air shroud.
3. Install the system cover.
4. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. Follow the procedure listed in After working inside your system.

LOM riser card

Removing the LOM riser card

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. If installed, remove the rear drive cage.
10. If installed, remove the risers.

Steps

1. Using a Phillips #2 screwdriver, loosen the screws that secure the LOM riser card to the system board.
2. Release the two blue plastic clips holding the LOM riser card.
3. Hold the LOM riser card by the edges on either side, and lift to remove it from the connector on the system board.
4. Slide the LOM riser card towards the front of the system until the Ethernet connectors or the Small form-factor pluggable (SFP) are clear of the slot in the back of the system.

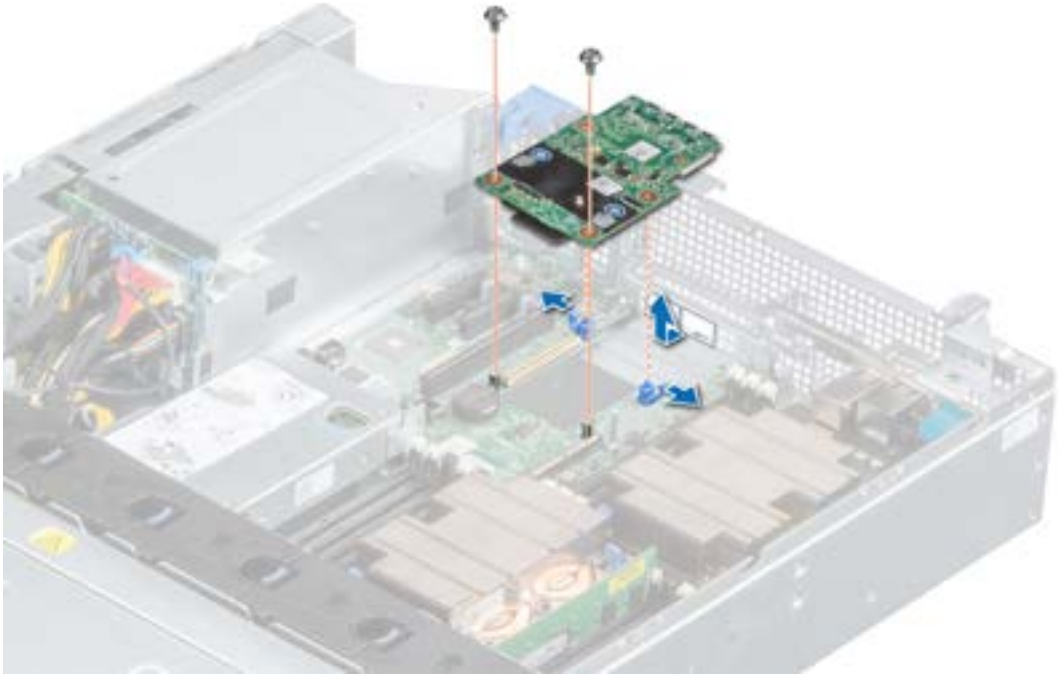

Figure 112. Removing LOM riser card

Next steps

Replace the LOM riser card.

Installing the LOM riser card

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. If installed, remove the rear drive cage.
11. If installed, remove the risers.

Steps

1. Align the connectors on the LOM riser card with the slot on the system.
2. Press the LOM riser card until the card is firmly seated on the system board connector and the two blue plastic clips hold the LOM riser card in place.

3. Using a Phillips #2 screwdriver, replace the screws to secure the LOM riser card to the system board.

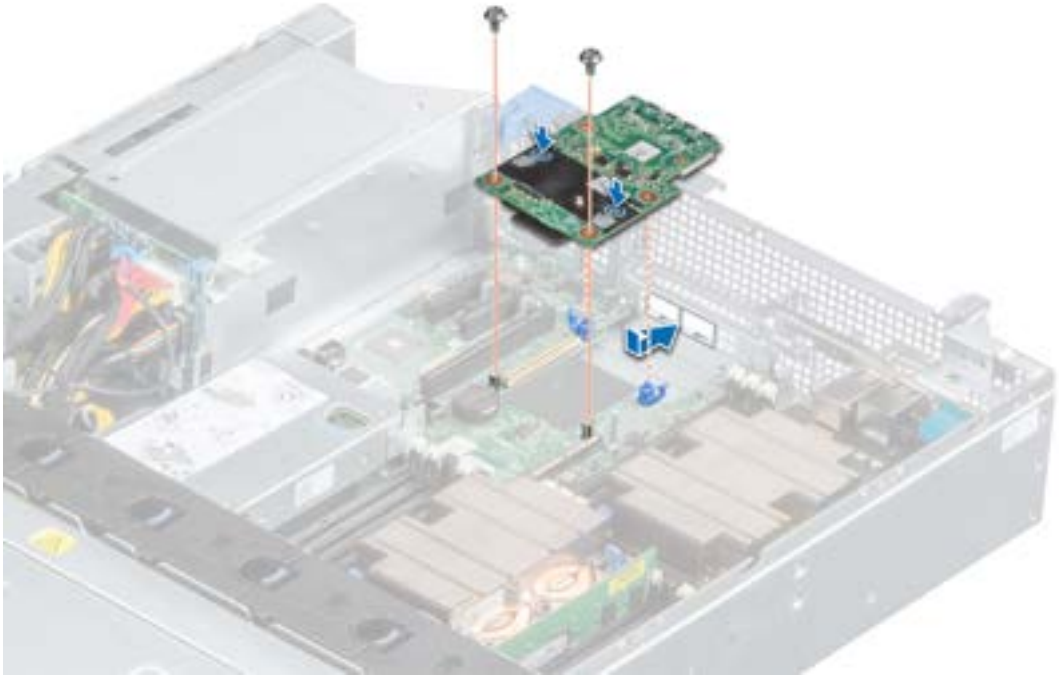

Figure 113. Installing LOM riser card

Next steps

1. If removed, install the risers.
2. If removed, install the rear drive cage.
3. Install the air shroud.
4. Install the system cover.
5. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
6. Open the drive bays, install all drives, and then close the drive bays.
7. Install the power supply units.
8. Follow the procedure listed in After working inside your system.

System battery

Replacing the system battery

Prerequisites

WARNING: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. For more information, see the safety information that shipped with your system.

1. Follow the safety guidelines listed in Safety instruction.
2. Power off the system and all attached peripherals.
3. Disconnect the system from the electrical outlet, and disconnect the peripherals.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.

8. Remove the system cover.
9. Remove the air shroud.
10. If applicable, disconnect the power or data cables from expansion card(s).
11. If installed, remove the low profile or full height X1 expansion card risers.

Steps

1. Locate the battery socket.

   CAUTION: To avoid damage to the battery connector, you must firmly support the connector while installing or removing a battery.

2. Use a plastic scribe to pry out the system battery.

Figure 114. Removing the system battery

3. To install a new system battery, hold the battery with the positive side facing up and slide it under the securing tabs.
4. Press the battery into the connector until it snaps into place.

Figure 115. Installing the system battery

Next steps

1. If removed, install the low profile or full height X1 expansion card risers.

2. If applicable, connect the cables to the expansion card(s).
3. If removed, install the air shroud.
4. Install the system cover.
5. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
6. Open the drive bays, install all drives, and then close the drive bays.
7. Install the power supply units.
8. Follow the procedure listed in After working inside your system.
9. While booting, press F2 to enter the System Setup and ensure that the battery is operating properly.
10. Enter the correct time and date in the System Setup **Time** and **Date** fields.
11. Exit the System Setup.

Optional internal USB memory key

NOTE: To locate the internal USB port on the system board, see the System board jumpers and connectors section.

Replacing the optional internal USB memory key

Prerequisites

CAUTION: To avoid interference with other components in the server, the maximum permissible dimensions of the USB memory key are 15.9 mm wide x 57.15 mm long x 7.9 mm high.

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. If installed, remove the low profile expansion card riser.

Steps

1. Locate the USB port or USB memory key on the system board.
   To locate the USB port, see the jumpers and connectors.
2. If installed, remove the USB memory key from the USB port.

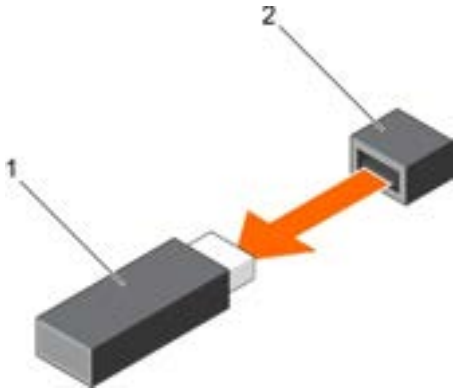

Figure 116. Removing the internal USB memory key

a. USB memory key
b. USB port

3. Insert the replacement USB memory key into the USB port.

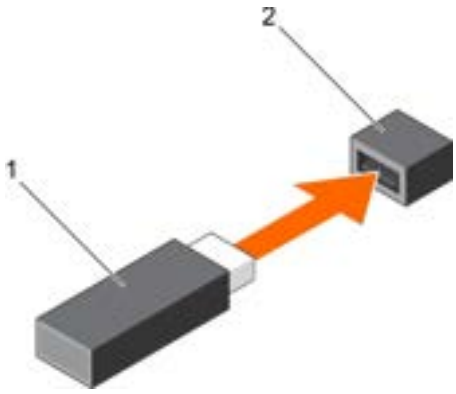

Figure 117. Installing the internal USB memory key

a. USB memory key
b. USB port

Next steps

1. If removed, install the low profile expansion card riser.
2. If removed, install the air shroud.
3. Install the system cover.
4. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. Follow the procedure listed in After working inside your system.
8. While booting, press F2 to enter **System Setup** and verify that the system detects the USB memory key.

Power supply units

NOTE: For more information, see the PSU specifications section.

Hot spare feature

Your system supports the hot spare feature that significantly reduces the power overhead associated with power supply unit (PSU) redundancy.

When the hot spare feature is enabled, one of the redundant PSUs is switched to the sleep state. The active PSU supports 100 percent of the load, thus operating at higher efficiency. The PSU in the sleep state monitors output voltage of the active PSU. If the output voltage of the active PSU drops, the PSU in the sleep state returns to an active output state.

If having both PSUs active is more efficient than having one PSU in the sleep state, the active PSU can also activate the sleeping PSU.

The default PSU settings are as follows:

- If the load on the active PSU is more than 50 percent, then the redundant PSU is switched to the active state.
- If the load on the active PSU falls below 20 percent, then the redundant PSU is switched to the sleep state.

You can configure the hot spare feature by using the iDRAC settings. For more information about iDRAC settings, see the *Integrated Dell Remote Access Controller User's Guide* available at idracmanuals.

Removing a power supply unit blank

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

If you are installing a second power supply unit, remove the power supply unit blank in the bay by pulling the blank outward.

CAUTION: To ensure proper system cooling, the power supply unit blank must be installed in the second power supply unit bay in a non-redundant configuration. Remove the power supply unit blank only if you are installing a second power supply unit.

Figure 118. Removing a power supply unit blank

Next steps

Replace a power supply unit blank.

Installing a power supply unit blank

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

   NOTE: If the system is using only one PSU, the PSU must be installed in PSU bay 1 and the PSU blank must be installed in PSU bay 2.

Steps

Align the PSU blank with the PSU bay and push it into the PSU bay until it clicks into place.

Figure 119. Installing a power supply unit blank

Next steps

Follow the procedure listed in After working inside your system.

Removing a power supply unit

The procedure for removing AC and DC PSUs is identical.

Prerequisites

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

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 120. Removing a power supply unit

Next steps

Replace a power supply unit.

Installing a power supply unit

The procedure for installing AC and DC PSUs is identical.

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. 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 PSU bay until the PSU is fully seated and the release latch snaps into place.

Figure 121. Installing a power supply unit

Next steps

1. 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 provided on the 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.

Power interposer board

Removing power interposer board

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the air shroud.
9. Disconnect all the cables from the power interposer board (PIB).

   CAUTION: To prevent damage to the power interposer board, you must remove the power supply module (s) from the system before removing the power interposer board.

   NOTE: Ensure that you note the routing of the cables as you remove them from the system board.

Steps

1. Press the blue release tab on the PIB to release it from the hook on the PSU cage.

2. Lift the board and slide it out at an angle to disengage the guide pins on the board.

Figure 122. Removing power interposer board

Next steps

Replace the power interposer board.

Installing power interposer board

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. Disconnect all the cables connected to the system board.

Steps

1. Press the blue release tab and align the slots on the PIB with the hooks on the PSU cage and slide it into place.
2. Route the cables and connect it to the system board.

Figure 123. Installing power interposer board

Next steps

1. Connect all the cables to the PIB.
2. Install the air shroud.
3. Install the system cover.
4. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. Follow the procedure listed in After working inside your system.

System board

Removing the system board

Prerequisites

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

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

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.
4. Open the drive bays, remove all drives, and then close the drive bays.

5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. Remove the following:

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

   a. Air shroud
   b. Drive cage (rear) (if installed)
   c. All expansion cards and risers
   d. Internal PERC riser
   e. IDSDM/vFlash module
   f. Optional internal USB key (if installed)
   g. Processors and heat sink modules
   h. Processors blanks (if installed)
   i. Memory modules and memory module blanks
   j. LOM riser card

Steps

1. Disconnect all cables from the system board.
2. Using a Phillips #2 screwdriver, remove nine screws securing the system board to the chassis.

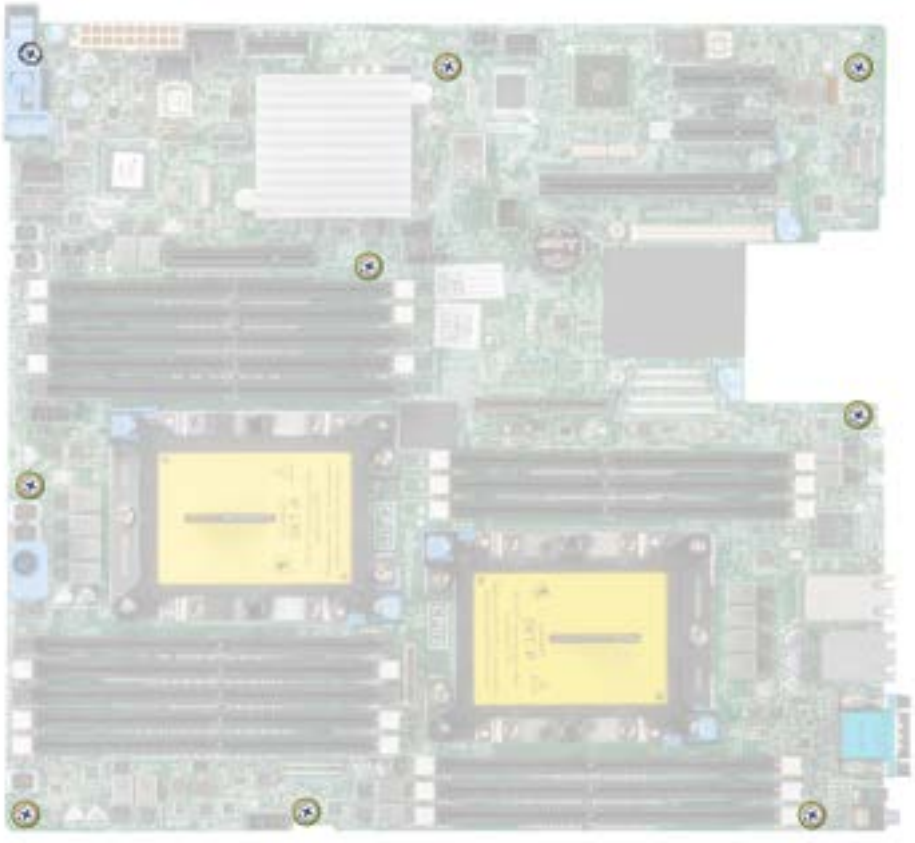

Figure 124. System board screws

3. Hold the system board holder, slightly lift the system board, and then slide it toward the front of the chassis.

   CAUTION: To prevent damage to the processor socket when replacing a faulty system board, ensure that you cover the processor socket with the processor dust cover.

4. Incline the system board at an angle, and lift the system board out of the chassis.

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

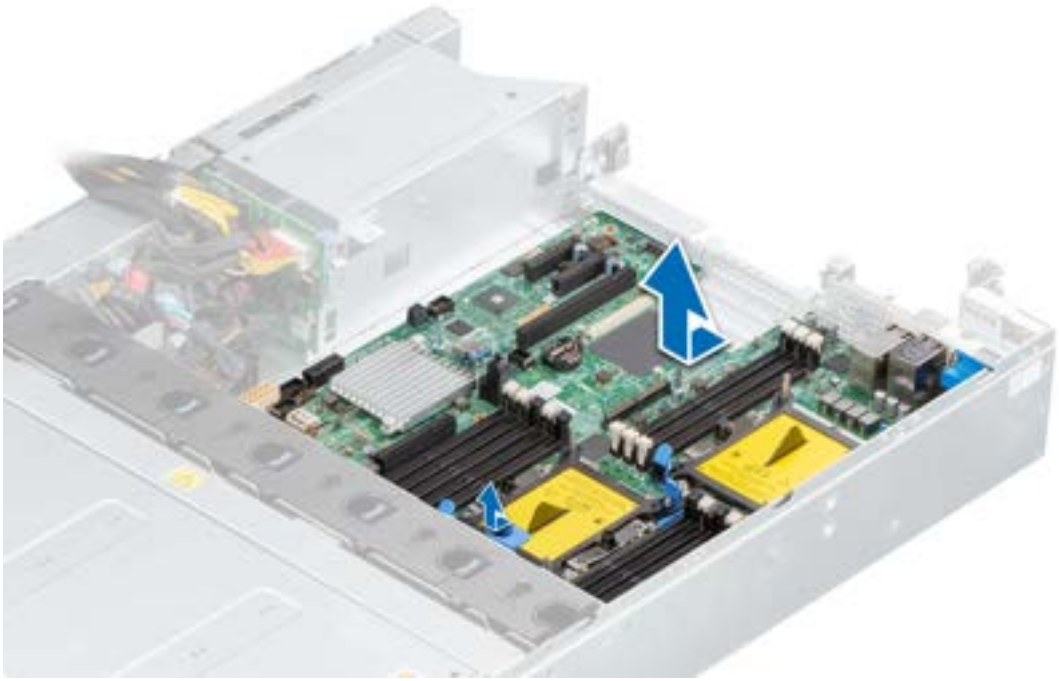

Figure 125. Removing the system board

Next steps

Replace or install the system board.

Installing the system board

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the following:
   a. Air shroud
   b. Drive cage (rear) (if installed)
   c. All expansion cards and risers
   d. Internal PERC riser
   e. IDSDM/vFlash module
   f. Optional internal USB key (if installed)
   g. Processors and heat sink modules
   h. Processors blanks (if installed)
   i. Memory modules and memory module blanks
   j. LOM riser card

Steps

1. Unpack the new system board.

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

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

2. Holding the system board holder, push the system board toward the back of the system till it is seated.

   CAUTION: To prevent damage to the processor socket when replacing a faulty system board, ensure that you cover the processor socket with the processor dust cover.

3. Using Phillips #2 screwdriver, tighten the screws to secure the system board to the chassis.

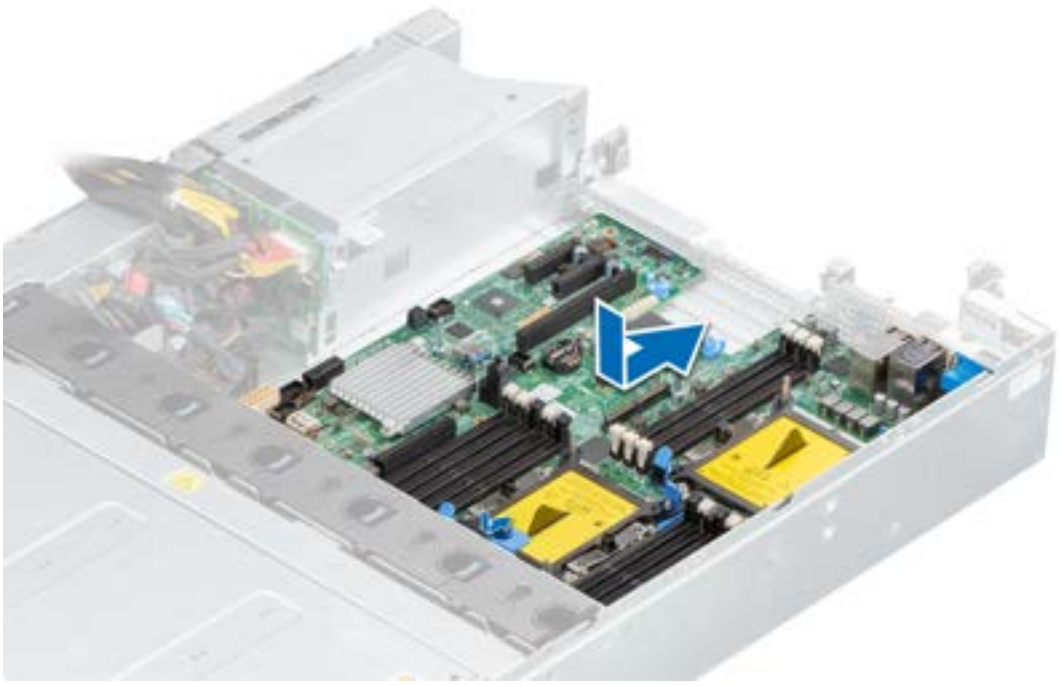

Figure 126. Installing system board

Next steps

1. Replace the following:
   a. Trusted platform module
   b. Internal PERC card
   c. Optional internal USB memory key
   d. IDSDM/vFlash module card
   e. All expansion cards and risers
   f. Processors and heat sink modules
   g. Processors blanks (if applicable)
   h. Memory modules and memory module blanks
   i. LOM riser card
   j. Drive cage (rear) (if applicable)
   k. Air shroud
2. Reconnect all cables to the system board.

   NOTE: Ensure that the cables inside the system are routed along the chassis wall and secured using the cable securing bracket.
3. Install the system cover.
4. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.

5. Open the drive bays, install all drives, and then close the drive bays.
6. Install the power supply units.
7. Follow the procedure listed in After working inside your system.
8. Ensure that you:
   a. Use the Easy Restore feature to restore the Service Tag. For more information, see the Restoring the system using Easy Restore section.
   b. If the Service Tag is not backed up in the backup flash device, enter the Service Tag manually. For more information, see the Manually update the Service Tag section.
   c. Update the BIOS and iDRAC versions.
   d. Re-enable the Trusted Platform Module (TPM). For more information, see the Re-enabling the TPM for BitLocker users section.
9. Import your new or existing iDRAC Enterprise license.

   For more information, see *Integrated Dell Remote Access Controller User's Guide*, at Integrated Dell Remote Access Controller User's Guide.

Restoring the system using Easy Restore

The easy restore feature enables you to restore your service tag, license, UEFI configuration, and the system configuration data after replacing the system board. All data is backed up in a backup flash device automatically. If BIOS detects a new system board, and the service tag in the backup flash device, BIOS prompts the user to restore the backup information.

About this task

Below is a list of options available:

- Restore the service tag, license, and diagnostics information, press **Y**
- Navigate to the Lifecycle Controller based restore options, press **N.**
- Restore data from a previously created **Hardware Server Profile**, press **F10**

  NOTE: When the restore process is complete, BIOS prompts to restore the system configuration data.
- To restore the system configuration data, press **Y**
- To use the default configuration settings, press **N**

  NOTE: After the restore process is complete, system reboots.

Manually update the Service Tag

After replacing a system board, if Easy Restore fails, follow this process to manually enter the Service Tag, using **System Setup**.

About this task

If you know the system service tag, use the **System Setup** menu to enter the service tag.

Steps

1. Power on the system.
2. To enter the **System Setup**, press **F2**.
3. Click **Service Tag Settings**.
4. Enter the service tag.

   NOTE: You can enter the service tag only when the **Service Tag** field is empty. Ensure that you enter the correct service tag. Once the service tag is entered, it cannot be updated or changed.
5. Click **OK**.

Trusted Platform Module

Upgrading the Trusted Platform Module

Prerequisites

1. Follow the safety guidelines listed Safety instructions.
2. Power off the system and all attached peripherals.
3. Disconnect the system from the electrical outlet, and disconnect the peripherals.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
8. Remove the system cover.
9. Remove the air shroud.
10. If installed, remove the risers.
11. If installed, remove the rear drive cage.

NOTE:

- Ensure that your operating system supports the version of the TPM module being installed.
- Ensure that you download and install the latest BIOS firmware on your system.
- Ensure that the BIOS is configured to enable UEFI boot mode.

About this task

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

Removing the TPM

Steps

1. Locate the TPM connector on the system board.

   NOTE: To locate the TPM connector on the system board, see the jumpers and connectors section.

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

Installing the TPM

Steps

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

Figure 127. Installing the TPM

Next steps

1. If removed, install the risers.
2. If removed, install the rear drive cage.
3. Install the air shroud.
4. Install the system cover.
5. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
6. Open the drive bays, install all drives, and then close the drive bays.
7. Install the power supply units.
8. Follow the procedure listed in After working inside your system.

Initializing TPM for BitLocker users

Steps

Initialize the TPM.

For more information, see Initialize the TPM.

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

Initializing the TPM 1.2 for TXT users

Steps

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

Initializing the TPM 2.0 for TXT users

Steps

1. While booting your system, press F2 to enter System Setup.

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

Cable chain assembly

Removing cable chain assembly

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. If installed, remove the front bezel.
9. Remove the following:
   a. Drive bay 1 backplane bracket.
   b. Drive bay 2 backplane bracket.
   c. Air shroud.
   d. Intrusion switch.
   e. If installed, rear drive cage.
   f. Internal PERC riser.
   g. Memory modules for processor 1.
   h. PIB.
10. Disconnect all cables connected to the cable chain assembly from the backplanes and the system board.

Steps

1. Using a Phillips #1 screwdriver, remove all the screws securing the support bar and lift it away from the system.
2. Remove the screws connecting the cable chain and the bay 2 backplane bracket.
3. Remove the screws securing the cable chain top cover, and disengage it from the guiding pins and lift it away from the system.

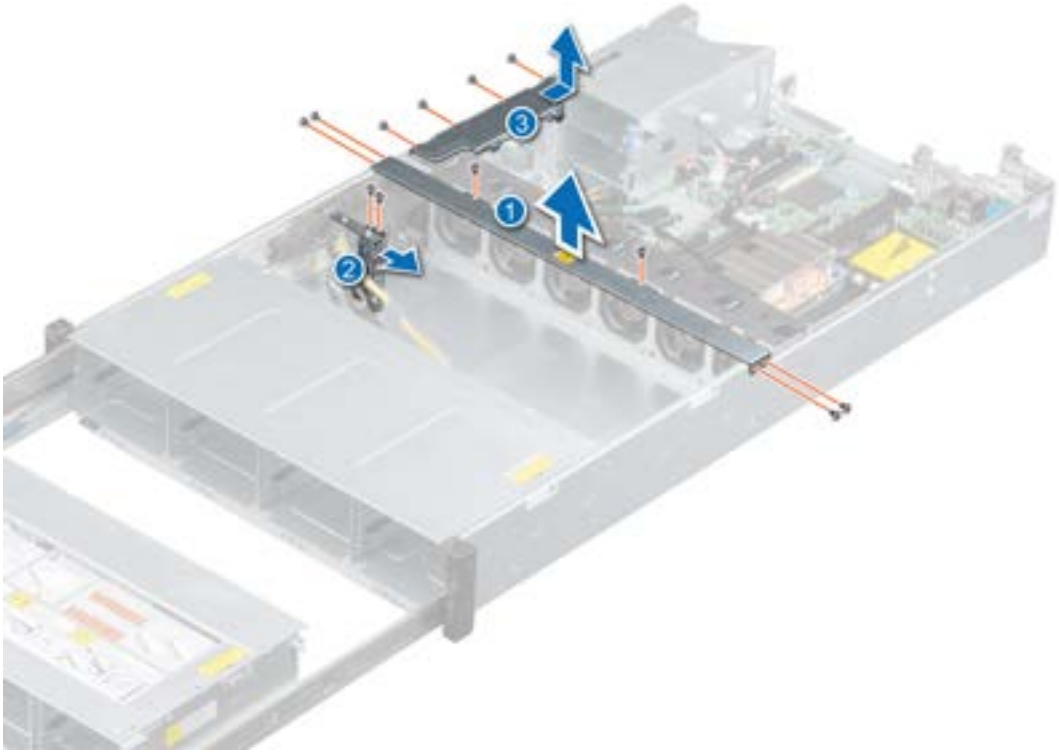

Figure 128. Removing the support bar, cable chain top cover and disconnecting the bay 2 backplane bracket from the cable chain assembly.

4. Loosen the captive screw for the cable chain side cover and disengage it from the guiding pins below and lift it away from the system.
5. Slide the left side of the system, partially off the table, until the bottom screws for the cable chain base bracket are visible and remove the screws.

CAUTION: Make sure the system is placed on a work bench before working for this step, as tilting the system or placing it on its side on the ground, would risk stressing the chassis or toppling the system, causing damage to components.

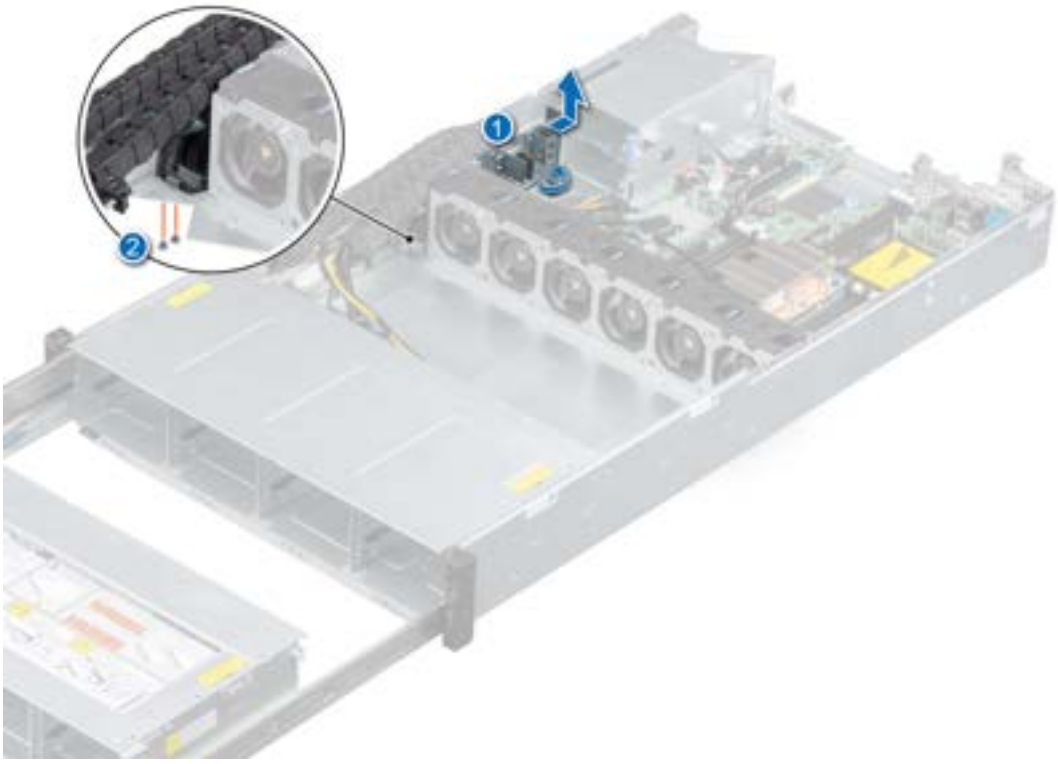

Figure 129. Removing screws for cable chain base bracket and cable chain side cover

6. Slide drive bay 2 towards the rear of the system until the screws for the left and right white plastic rail stops are visible and remove them.
7. Disconnect the left control panel cable from the system board and release it from the cable chain base bracket.

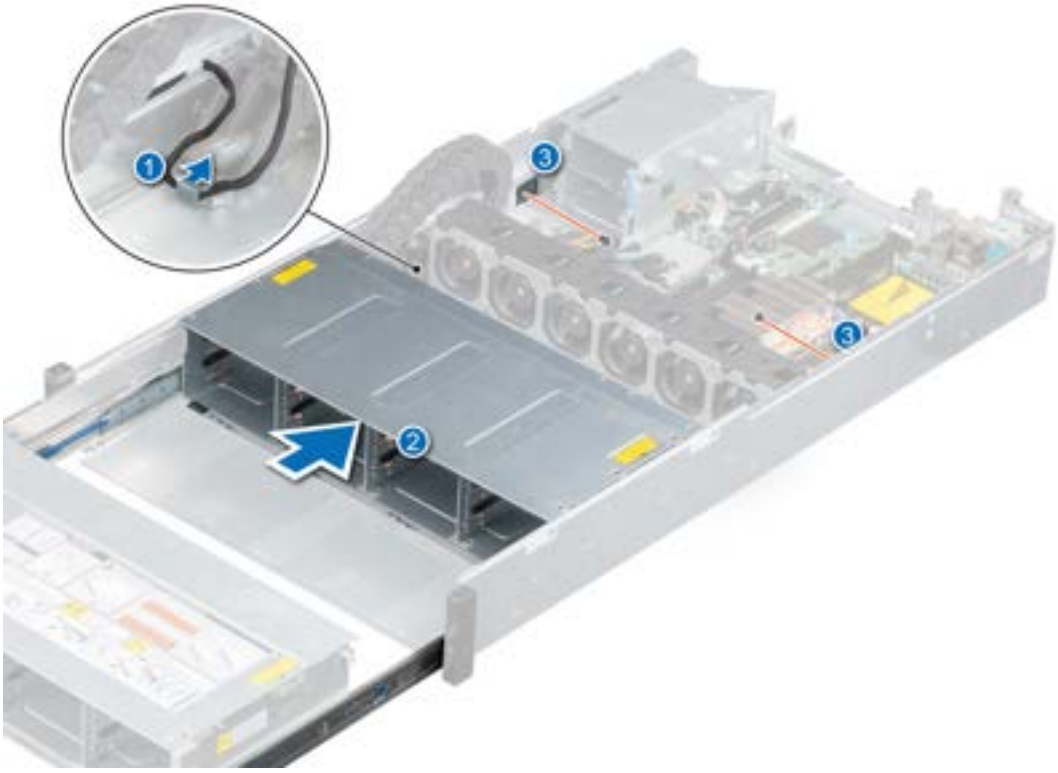

Figure 130. Removing the left and right rail white plastic rail stops

8. Remove the screws connecting the cable chain rail to the chassis.
9. Extend the drive bays all the way out of the bay area, until there is a gap to remove the cable chain rail.
10. Lift the cable chain assembly out of the system.

Figure 131. Removing the cable chain assembly from the system

Next steps

Replace the cable chain assembly.

Installing the cable chain assembly

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. Open the drive bays, remove all drives, and then close the drive bays.
6. Remove the power supply units.
7. If installed, remove front bezel.
8. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
9. Remove the system cover.
10. Remove the following:
    a. Drive bay 1 backplane bracket.
    b. Drive bay 2 backplane bracket.
    c. Air shroud.
    d. Intrusion switch.
    e. If installed, rear drive cage.
    f. Internal PERC riser.
    g. Memory modules for processor 1.

h. PIB.

11. Disconnect all cables connected to the cable chain assembly from the backplanes and the system board.

Steps

1. Place the cable chain assembly in the system and route the left control panel cable through the cable chain base bracket.
2. Using a Phillips #1 screwdriver, replace the screws for the cable chain rail after aligning it to the chassis and align the cable chain assembly to the bottom screw holes.

Figure 132. Placing the cable chain assembly in the system

3. Slide the left side of the system, partially off the table, until the bottom screws holes for the cable chain base bracket are visible and replace the screws.
4. Align the cable chain side cover to the guiding pins on the system and tighten the captive screw.

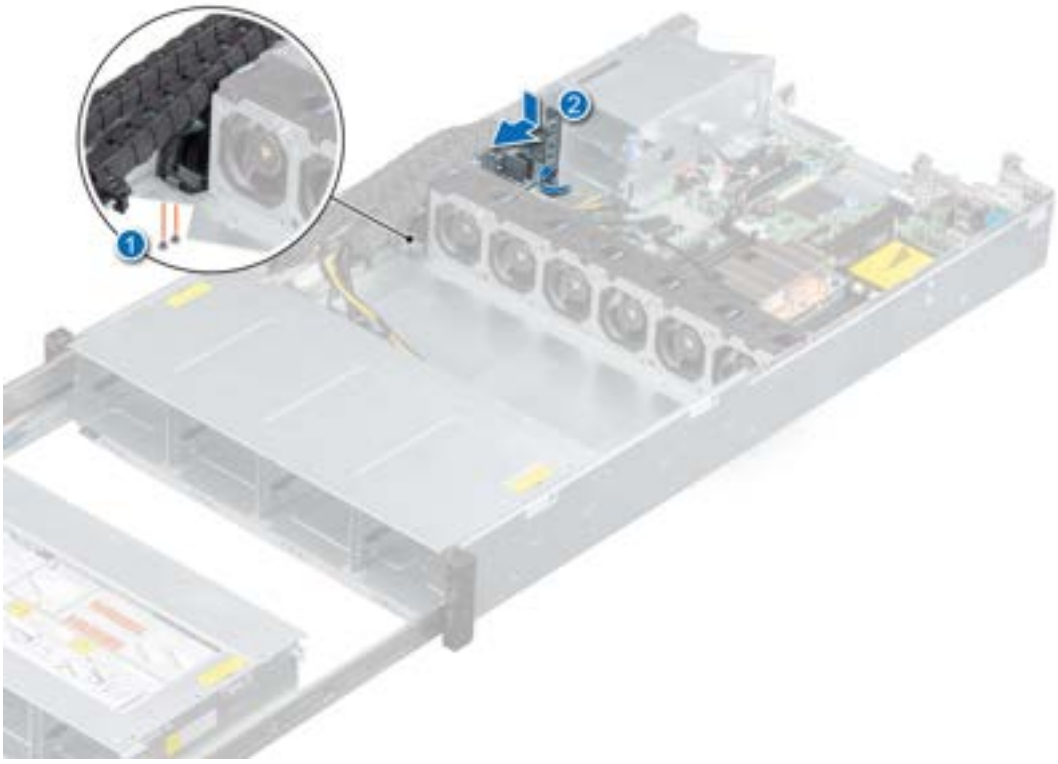

Figure 133. Replacing the cable chain side cover and the bottom screws

5. Replace the screws for the left and right white plastic rail stops.

NOTE: Make sure the left control panel cable is routed through the cable chain base bracket and connect the cable connector to the system board connector.

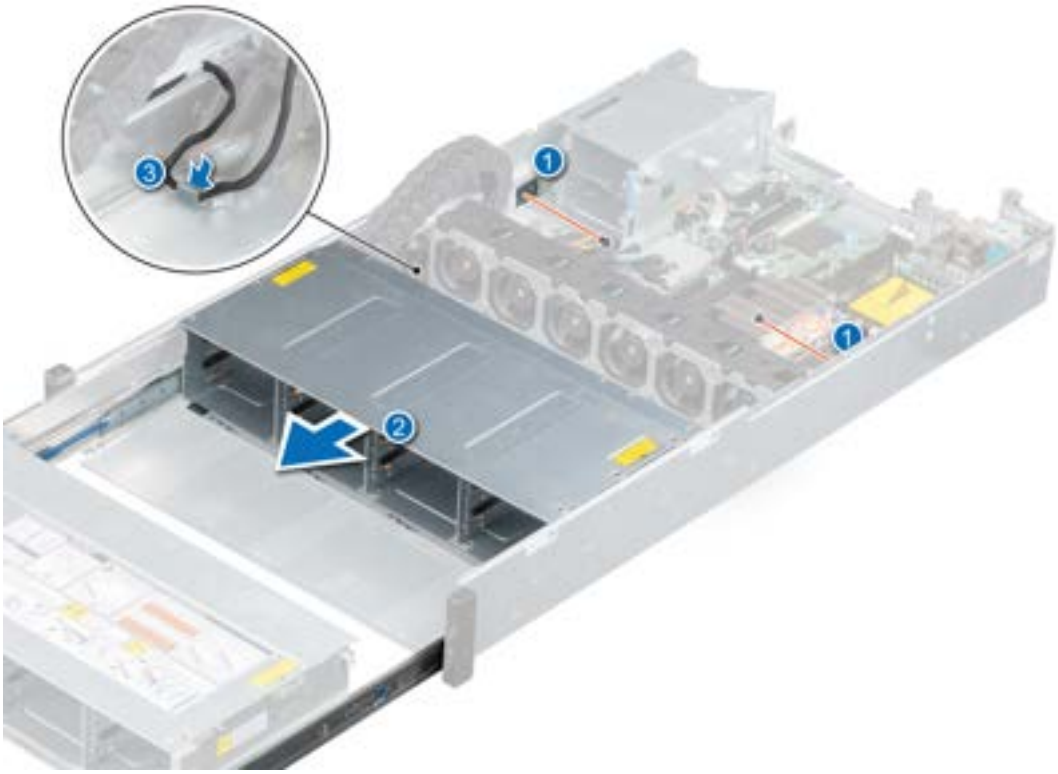

Figure 134. Replacing the screws for the left and right white plastic rail stops

6. Align the support bar to the chassis and replace all the screws.
7. Align the bay 2 backplane bracket to the cable chain assembly and replace the screws.
8. Align the cable chain top cover to the guiding pins and replace all the screws.

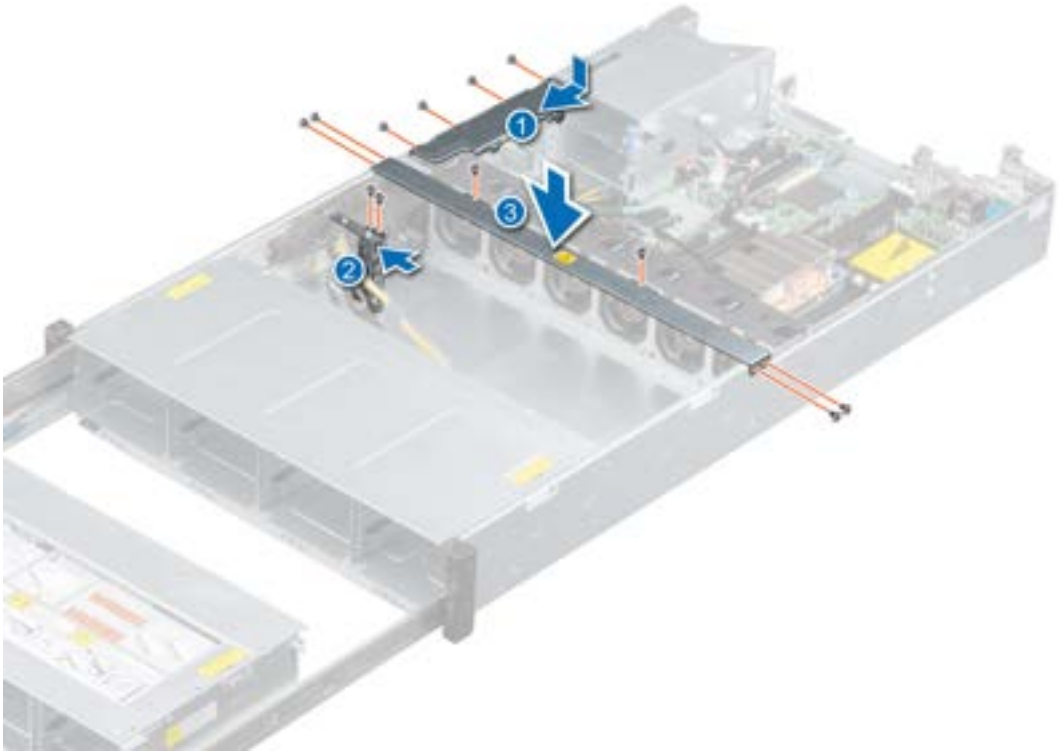

Figure 135. Replacing the support bar, cable chain top cover and connecting the bay 2 backplane bracket from the cable chain assembly.

Next steps

1. Replace the following:
   a. PIB.
   b. Memory modules for processor 1.
   c. Internal PERC card
   d. If installed, rear drive cage.
   e. Intrusion switch.
   f. Air shroud.
   g. Drive bay 1 bracket.
   h. Drive bay 2 bracket.
   i. Connect all the cables to the backplane and system board.
2. Install the system cover.
3. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
4. Open the drive bays, install all drives, and then close the drive bays.
5. Install the power supply units.
6. If removed, install front bezel.
7. Follow the procedure listed in After working inside your system.

Control panel

Removing the left control panel

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.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. Remove the system cover.
8. If installed, remove the front bezel.
9. Remove the cable chain assembly.
10. Disconnect the control panel cable from the system board connector.

Steps

1. Remove the cable from the left ear cable channel.

   NOTE: Ensure that you note the routing of the cables as you remove them from the system board. You must route the cables properly when you replace them to prevent the cables from being pinched or crimped.

2. Using a Phillips #1 screwdriver, remove the screws that secure the left control panel assembly to the system.
3. Holding by the sides, remove the left control panel assembly away from the system.

Figure 136. Removing the left control panel

Next steps

Replace the left control panel.

Installing the left control panel

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.
4. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
5. If installed, remove the front bezel.
6. Open the drive bays, remove all drives, and then close the drive bays.
7. Remove the power supply units.
8. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
9. Remove the system cover.
10. Remove the cable chain assembly.

Steps

1. Align the left control panel assembly with the control panel slot on the chassis and using Phillips #1 screwdriver, replace the screws to secure the left control panel assembly to the chassis.
2. Route the left control panel cable through the cable channel of the system.

Figure 137. Installing the left control panel

3. Connect the control panel cable to the system board connector.

Next steps

1. Install the cable chain assembly.
2. Close the drive bays.
3. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
4. Install the power supply units.
5. Open the drive bays, install all drives, and then close the drive bays.

6. If removed, install the front bezel.
7. Follow the procedure listed in After working inside your system.

Removing the right control panel

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Power off the system and all attached peripherals.
3. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. If installed, remove front bezel.
8. Remove the system cover.
9. Remove the air shroud.
10. Remove the internal PERC card.
11. Disconnect all cables connected to the system board.

Steps

1. Open the blue release clip and disconnect the right control panel cable from the system board.
2. Release the cable from the right rack ear cable clips and push the cable connector through the side of the fan cage.

   NOTE: Ensure that you note the routing of the cables as you remove them from the system board. Route the cables properly when you replace them to prevent the cables from being pinched or crimped.

3. Push bay 2 into the chassis and release the cable from the right rack ear cable clips.

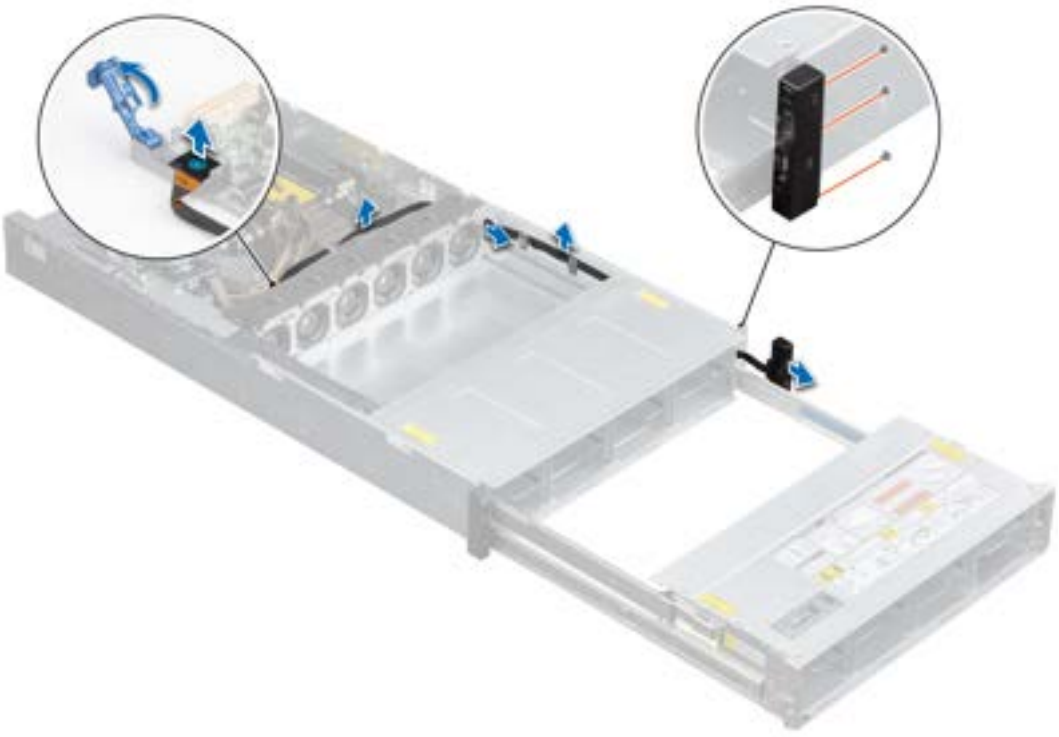

Figure 138. Removing the control panel cable

4. Using Phillips #1 screwdriver, remove the screws that secure the right control panel assembly to the system.
5. Holding by the sides, remove the right control panel assembly away from the system.

Figure 139. Removing the right control panel

Next steps

Replace the right control panel.

Installing the right control panel

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Power off the system and all attached peripherals.
3. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.
4. Open the drive bays, remove all drives, and then close the drive bays.
5. Remove the power supply units.
6. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
7. If installed, remove front bezel.
8. Remove the system cover.
9. Remove the air shroud.
10. Remove the internal PERC card.

Steps

1. Route the control panel cable through the right control panel cable clips and push the cable connector through the side of bay 2.

Figure 140. Aligning the right control panel cable

2. Extend bay 2 and pull the cable through the side of the bay.
3. Route the cable through the right control panel cable clip and push the cable connector through the side of the fan cage.
4. Connect the control panel cable to the connector on the system board and close the blue release clip.
5. Using a Phillips #1 screwdriver, tighten the screws to secure the right control panel assembly to the system.

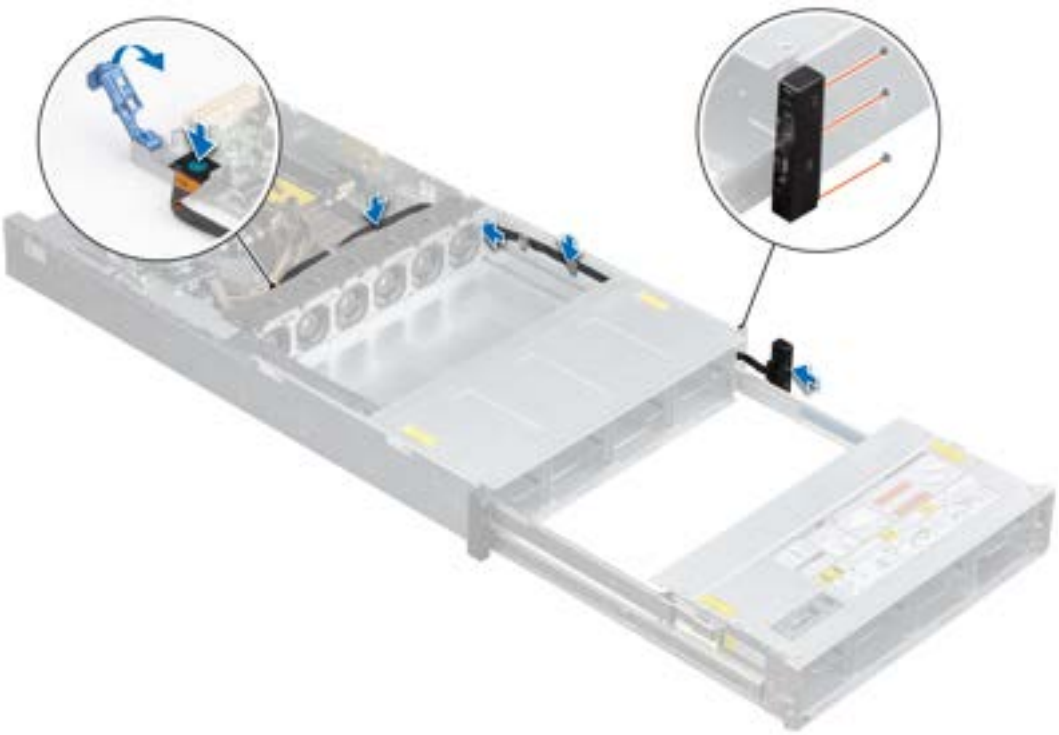

Figure 141. Installing the right control panel

Next steps

1. Install the internal PERC card.
2. Install the air shroud.
3. Close the drive bays.
4. Install the system cover.
5. Place the system into the rack. For more information, see the *Rail Installation Guide* available at https://www.dell.com/poweredgemanuals.
6. Install the power supply units.
7. Open the drive bays, install all drives, and then close the drive bays.
8. If removed, install the front bezel.
9. Follow the procedure listed in After working inside your system.

5

Jumpers and connectors

This topic provides specific information about the jumpers. It also provides some basic information about jumpers and switches and describes the connectors on the various boards in the system. Jumpers on the system board help to disable the system and setup passwords. You must know the connectors on the system board to install components and cables correctly.

Topics:

- System board connectors
- System board jumper settings
- Disabling forgotten password

System board connectors

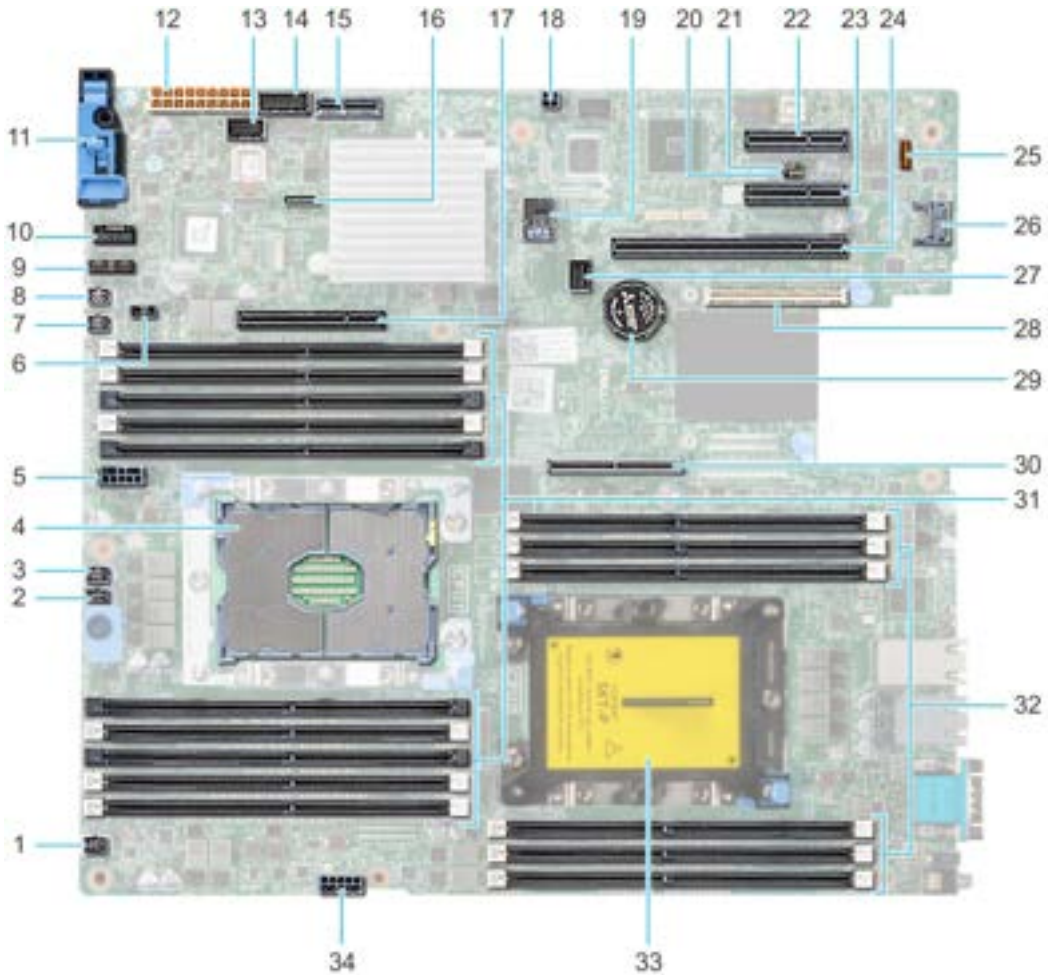

Figure 142. System board jumpers and connectors

Table 15. System board jumpers and connectors

Item	Connector	Description
1.	FAN6	Fan6 connector

Table 15. System board jumpers and connectors (continued)

Item	Connector	Description
2.	FAN5	Fan5 connector
3.	FAN4	Fan4 connector
4.	CPU1	Processor socket 1
5.	CPU1_PWR_CONN(P2)	CPU1 power connector
6.	J_INTRU	Intrusion switch connector
7.	FAN3	Fan3 connector
8.	FAN2	Fan2 connector
9.	J_BP_SIG1	Backplane signal connector 1
10.	LFT_CP_CONN	Left control panel connector
11.	RGT_CP_CONN	Right panel connector
12.	SYS_PWR_CONN(P1)	System power connector
13.	J_PIB_SIG1	Power interface board signal connector 1
14.	J_PIB_SIG2	Power interface board signal connector 2
15.	J_ACE	Internal Dual SD Module
16.	J_SATA_A1	Internal SATA A connector
17.	PCIE_G3_X8(CPU1)	Internal PERC controller connector
18.	J_REAR_BP_PWR1	ODD power connector
19.	INT_USB_3.0	USB connector
20.	NVRAM_CLR	Clear NVRAM
21.	PWRD_EN	Reset BIOS password
22.	SLOT6	PCIe slot 6
23.	SLOT5	PCIe slot 5
24.	SLOT4	PCIe slot 4
25.	LEDs (7)	System board diagnostic LED indicators
26.	J_TPM_MODULE	TPM module connector
27.	J_BP_SIG0	Backplane signal connector
28.	J_MEZZ_A1	LOM riser card connector
29.	BATTERY	Battery connector
30.	PCIE_G3_X16(CPU1)	Riser 1 connector
31.	A6, A5, A10, A4, A9, A7, A1, A8, A2, A3	Memory module sockets
32.	B3, B2, B1, B4, B5, B6	Memory module sockets
33.	CPU2	Processor 2 dust cover
34.	CPU2_PWR_CONN(P3)	Processor 2 power connector

System board jumper settings

For information on resetting the password jumper to disable a password, see the Disabling a forgotten password section.

Disabling forgotten password

The software security features of the system include a system password and a setup password. The password jumper enables or disables password features and clears any password(s) currently in use.

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.

Steps

1. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Move the jumper on the system board jumper from pins 2 and 4 to pins 4 and 6.
4. Install the system cover.

   The existing passwords are not disabled (erased) until the system boots with the jumper on pins 4 and 6. However, before you assign a new system and/or setup password, you must move the jumper back to pins 2 and 4.

   NOTE: If you assign a new system and/or setup password with the jumper on pins 4 and 6, the system disables the new password(s) the next time it boots.

5. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
6. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
7. Remove the system cover.
8. Move the jumper on the system board jumper from pins 4 and 6 to pins 2 and 4.
9. Install the system cover.
10. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
11. Assign a new system and/or setup password.

6

System diagnostics and indicator codes

The diagnostic indicators on the system front panel display system status during system startup.

Topics:

- System health and system ID indicator codes
- iDRAC Direct LED indicator codes
- NIC indicator codes
- Power supply unit indicator codes
- Drive indicator codes
- System diagnostics

System health and system ID indicator codes

The system health and system ID indicator is located on the left control panel of your system.

Figure 143. System health and system ID indicator

Table 16. System health and system ID indicator codes

System health and system ID indicator code	Condition
Solid blue	Indicates that the system is turned on, system is healthy, and system ID mode is not active. Press the system health and system ID button to switch to system ID mode.
Blinking blue	Indicates that the system ID mode is active. Press the system health and system ID button to switch to system health mode.

Table 16. System health and system ID indicator codes (continued)

System health and system ID indicator code	Condition
Solid amber	Indicates that the system is in fail-safe mode. If the problem persists, see the Getting help section.
Blinking amber	Indicates that the system is experiencing a fault. Check the System Event Log for specific 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**.

iDRAC Direct LED indicator codes

The iDRAC Direct LED indicator lights up to indicate that the port is connected and is being used as a part of the iDRAC subsystem.

You can configure iDRAC Direct by using a USB to micro USB (type AB) cable, which you can connect to your laptop or tablet. The following table describes iDRAC Direct activity when the iDRAC Direct port is active:

Table 17. iDRAC Direct LED indicator codes

iDRAC Direct LED indicator code	Condition
Solid green for two seconds	Indicates that the laptop or tablet is connected.
Flashing green (on for two seconds and off for two seconds)	Indicates that the laptop or tablet connected is recognized.
Powers off	Indicates that the laptop or tablet is unplugged.

NIC indicator codes

Each NIC on the back of the system 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.

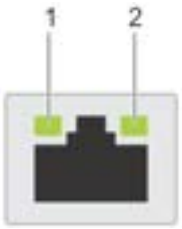

Figure 144. NIC indicator codes

1. Link LED indicator
2. Activity LED indicator

Table 18. 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 18. 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.

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.

Figure 145. AC PSU status indicator

1. AC PSU status indicator/handle

Table 19. 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.**
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 power on the system.** **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 power 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.**

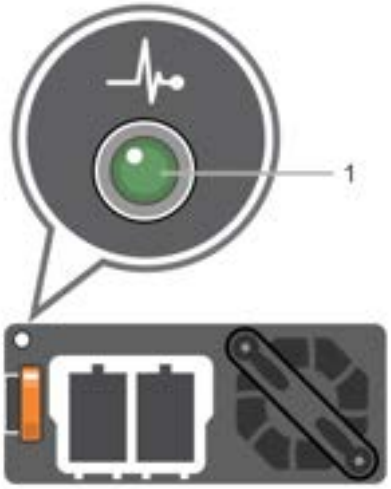

Figure 146. DC PSU status indicator

1. DC PSU status indicator

Table 20. DC 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 hot-plugging a PSU, the PSU indicator blinks green. This indicates that there is a PSU mismatch about 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 power on the system.** **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 conversely, you must to power off the system.** **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.**

Drive indicator codes

The LEDs on the drive carrier indicates the state of each drive. Each drive carrier in your system has two LEDs: an activity LED (green) and a status LED (bicolor, green/amber). The activity LED flashes whenever the drive is accessed.

Figure 147. Drive indicators

1. Drive activity LED indicator
2. Drive status LED indicator
3. Drive capacity label

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

Table 21. Drive indicator codes

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

System diagnostics

If you experience a problem with your system, run the system diagnostics before contacting Dell for technical assistance. The purpose of running system diagnostics is to test your system hardware without using additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use the diagnostics results to help you solve the problem.

Dell Embedded System Diagnostics

NOTE: The Dell Embedded System Diagnostics is also known as Enhanced Pre-boot System Assessment (ePSA) diagnostics.

The Embedded System Diagnostics provides a set of options for particular device groups or devices allowing you to:

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

Running the Embedded System Diagnostics from Boot Manager

Run the Embedded System Diagnostics (ePSA) if your system does not boot.

Steps

1. When the system is booting, press F11.
2. Use the up arrow and down arrow keys to select **System Utilities** > **Launch Diagnostics**.
3. Alternatively, when the system is booting, press F10, select **Hardware Diagnostics** > **Run Hardware Diagnostics**.
   The **ePSA Pre-boot System Assessment** window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

Running the Embedded System Diagnostics from the Dell Lifecycle Controller

Steps

1. As the system boots, press F10.
2. Select **Hardware Diagnostics** → **Run Hardware Diagnostics**.
   The **ePSA Pre-boot System Assessment** window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

System diagnostic controls

Menu	Description
Configuration	Displays the configuration and status information of all detected devices.
Results	Displays the results of all tests that are run.
System health	Provides the current overview of the system performance.
Event log	Displays a time-stamped log of the results of all tests run on the system. This is displayed if at least one event description is recorded.

7

Getting help

Topics:

- Contacting Dell
- Recycling or End-of-Life service information
- Accessing system information by using QRL
- Receiving automated support with SupportAssist

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. The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.

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.

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 Installtion 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 Dell Technologies PowerEdge R740xd2 system

Figure 148. Quick Resource Locator for Dell Technologies PowerEdge R740xd2 system

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.

8

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 22. Documentation resources

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

Table 22. Documentation resources (continued)

Task	Document	Location
	For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document.	www.dell.com/support/drivers
Managing your system	For information about system management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	poweredge manuals
	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
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	poweredge manuals