Dell EMC PowerEdge XE2420

Installation and Service Manual

Regulatory Model: B23S Series
Regulatory Type: B23S001
June 2020
Rev. A00

Notes, cautions, and warnings

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

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

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

Contents

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

PowerEdge XE2420 system overview

The PowerEdge XE2420 system is a 2U server that supports:

- Two Intel Xeon Cascade Lake scalable processors up to 150 W
- 16 DDR4 RDIMM and Load Reduced DIMM
- Two, or four, 2.5-inch SATA, SAS, NVMe, or six EDSFF E1.L drives configuration.
- BOSS dual SATA M.2 boot card
- Two redundant 2000 W AC PSUs and 1100 W DC PSUs

NOTE: For more information about how to hot swap NVMe PCIe SSD U.2 device, see the *Dell Express Flash NVMe PCIe SSD User's Guide* at https://www.dell.com/support**> Browse all Products** > **Data Center Infrastructure** > **Storage Adapters & Controllers** > **Dell PowerEdge Express Flash NVMe PCIe SSD** > **Documentation** > **Manuals and Documents**.

NOTE: All instances of SAS, SATA drives are seen as drives in this document, unless specified otherwise.

NOTE: In 2C configuration, hard drive slots 2 and 3 do not support NVMe drives if only processor 1 is installed.

For more information about supported drives, see the Drive specifications section.

NOTE: The PowerEdge XE2420 system is suitable for installation in Network Telecommunications Facilities (NTF), and locations where the National Electrical Code (NEC) applies.

NOTE: The PowerEdge XE2420 system is suitable for Common Bonding Networks (CBNs).

Topics:

Front view of the System

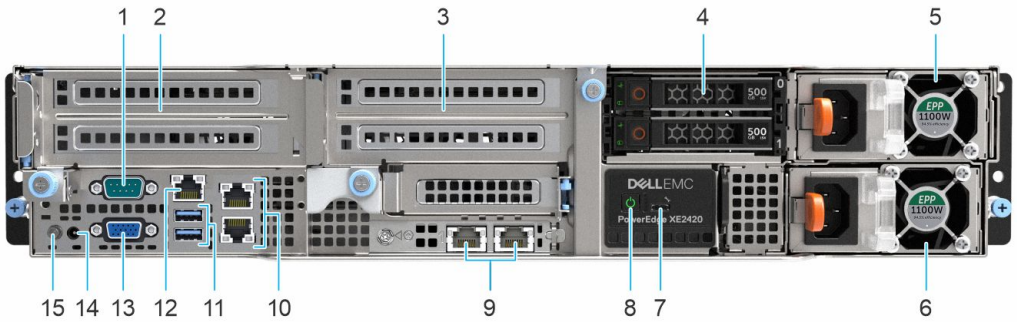


Figure 1. Front view of 2 x 2.5-inch drive system

Table 1. Front view of 2 x 2.5-inch drive system

Item	Ports, panels, and slots	Icon	Description
1	Serial port	IOIOI	Enables you to connect a serial device to the system. For more information, see the Technical specifications section.
2	GPU riser 1 slots	N/A	The GPU card slot (riser 1) connects up to two full-height GPUs. For more information, see the Expansion card installation guidelines section.
3	GPU riser 2 slots	N/A	The GPU card slot (riser 2) connects up to two full-height GPUs. For more information, see the Expansion card installation guidelines section.
4	Drive slots	N/A	Enable you to install drives that are supported on your system. For more information about drives, see Technical specifications section.
5	Power supply unit (1)	N/A	For more information, see Technical specifications section.
6	Power supply unit (2)	N/A	For more information, see Technical specifications section.
7	iDRAC Direct port		The iDRAC Direct port is micro USB 2.0-compliant. This port enables you to access the iDRAC Direct features. For more information, see the iDRAC User's Guide at www.dell.com/idracmanuals
8	Power button		Indicates if the system is turned on or off. Press the power button to manually turn on or off the system. **NOTE:** Press the power button to gracefully shut down an ACPI-compliant operating system.
9	OCP ports		The NIC ports that are integrated on the network daughter card (NDC) provide network connectivity. For more information about the supported configurations, see Technical specifications section.
10	Ethernet ports		Use the Ethernet ports to connect Local Area Networks (LANs) to the system. For more information about the supported Ethernet ports, see

Table 1. Front view of 2 x 2.5-inch drive system (continued)

Item	Ports, panels, and slots	Icon	Description
			Technical specifications section.
11	USB 3.0 port	SS	The USB ports are 9-pin and 3.0-compliant. These ports enable you to connect USB devices to the system.
12	iDRAC9 dedicated port		Enables you to remotely access iDRAC. For more information, see the iDRAC User's Guide at www.dell.com/idracmanuals
13	VGA port		Enables you to connect a display device to the system. For more information, see the Technical specifications section.
14	System status indicator cable port	N/A	Enables you to connect the status indicator cable and view system status when the CMA is installed.
15	System identification button		The System Identification (ID) button is available on the front to identify a system in a rack by turning on the system ID button to reset iDRAC and to access BIOS using the step through mode.

For more information about the ports, see the Technical Specifications section.

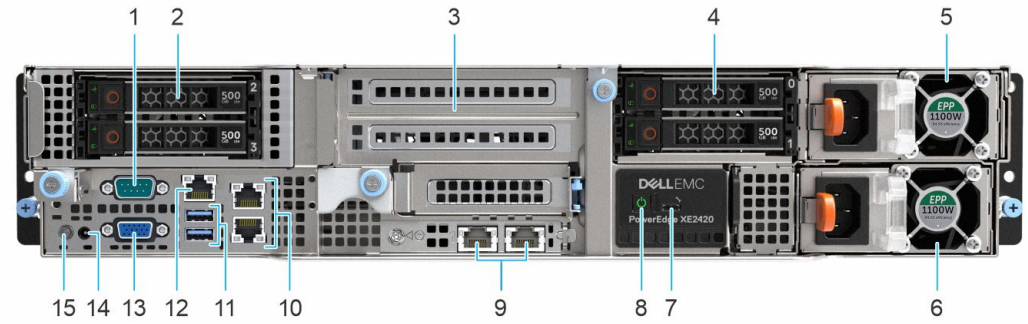


Figure 2. Front view of 4 x 2.5-inch drive system

Table 2. Front view of 4 x 2.5-inch drive system

Item	Ports, panels, and slots	Icon	Description
1	Serial port	IOIOI	Enables you to connect a serial device to the system. For more information, see the Technical specifications section.
2	Drive slots (2,3)	N/A	Enable you to install drives that are supported on your system. For more information about drives, see Technical specifications section.

Table 2. Front view of 4 x 2.5-inch drive system (continued)

Item	Ports, panels, and slots	Icon	Description
3	GPU riser 2 slots	N/A	The GPU card slot (riser 2) connects up to two full-height GPUs. For more information, see the Expansion card installation guidelines section.
4	Drive slots (0,1)	N/A	Enable you to install drives that are supported on your system. For more information about drives, see Technical specifications section.
5	Power supply unit (1)	N/A	For more information, see Technical specifications section.
6	Power supply unit (2)	N/A	For more information, see Technical specifications section.
7	iDRAC Direct port		The iDRAC Direct port is micro USB 2.0-compliant. This port enables you to access the iDRAC Direct features. For more information, see the iDRAC User's Guide at www.dell.com/idracmanuals.
8	Power button		Indicates if the system is turned on or off. Press the power button to manually turn on or off the system. **NOTE:** Press the power button to gracefully shut down an ACPI-compliant operating system.
9	OCP ports		The NIC ports that are integrated on the network daughter card (NDC) provide network connectivity. For more information about the supported configurations, see Technical specifications section.
10	Ethernet ports		Use the Ethernet ports to connect Local Area Networks (LANs) to the system. For more information about the supported Ethernet ports, see Technical specifications section.
11	USB 3.0 port		The USB ports are 9-pin and 3.0-compliant. These ports enable you to connect USB devices to the system.
12	iDRAC9 dedicated port		Enables you to remotely access iDRAC. For more information, see the iDRAC

Table 2. Front view of 4 x 2.5-inch drive system (continued)

Item	Ports, panels, and slots	Icon	Description
			User's Guide at www.dell.com/idracmanuals
13	VGA port		Enables you to connect a display device to the system. For more information, see the Technical specifications section.
14	System status indicator cable port	N/A	Enables you to connect the status indicator cable and view system status when CMA is installed.
15	System identification button		The System Identification (ID) button is available on the front to identify a system in a rack by turning on the system ID button to reset iDRAC and to access BIOS using the step through mode.

For more information about the ports, see the Technical Specifications section.

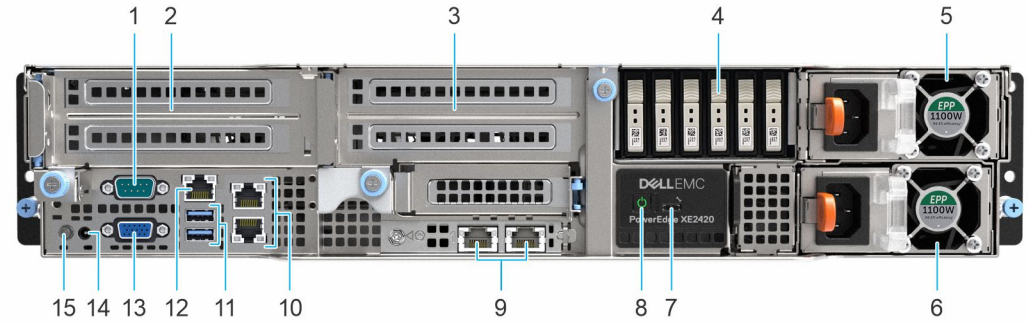


Figure 3. Front view of 6 x EDSFF drive system

Table 3. Front view of 6 x EDSFF drive system

Item	Ports, panels, and slots	Icon	Description
1	Serial port	IOIOI	Enables you to connect a serial device to the system. For more information, see the Technical specifications section.
2	GPU riser 1 slots	N/A	The GPU card slot (riser 1) connects up to two full-height GPUs. For more information, see the Expansion card installation guidelines section.
3	GPU riser 2 slots	N/A	The GPU card slot (riser 2) connects up to two full-height GPUs. For more information, see the Expansion card installation guidelines section.
4	EDSFF drive bay assembly	N/A	Enable you to install drives that are supported on your system. For more information

Table 3. Front view of 6 x EDSFF drive system (continued)

Item	Ports, panels, and slots	Icon	Description
			about drives, see Technical specifications section.
5	Power supply unit (1)	N/A	For more information, see Technical specifications section.
6	Power supply unit (2)	N/A	For more information, see Technical specifications section.
7	iDRAC Direct port		The iDRAC Direct port is micro USB 2.0-compliant. This port enables you to access the iDRAC Direct features. For more information, see the iDRAC User's Guide at www.dell.com/idracmanuals.
8	Power button		Indicates if the system is turned on or off. Press the power button to manually turn on or off the system. **NOTE:** Press the power button to gracefully shut down an ACPI-compliant operating system.
9	OCP ports		The NIC ports that are integrated on the network daughter card (NDC) provide network connectivity. For more information about the supported configurations, see Technical specifications section.
10	Ethernet ports		Use the Ethernet ports to connect Local Area Networks (LANs) to the system. For more information about the supported Ethernet ports, see Technical specifications section.
11	USB 3.0 port		The USB ports are 9-pin and 3.0-compliant. These ports enable you to connect USB devices to the system.
12	iDRAC9 dedicated port		Enables you to remotely access iDRAC. For more information, see the iDRAC User's Guide at www.dell.com/idracmanuals
13	VGA port		Enables you to connect a display device to the system. For more information, see the Technical specifications section.
14	System status indicator cable port	N/A	Enables you to connect the status indicator cable and

Table 3. Front view of 6 x EDSFF drive system (continued)

Item	Ports, panels, and slots	Icon	Description
			view system status when CMA is installed.
15	System identification button		The System Identification (ID) button is available on the front to identify a system in a rack by turning on the system ID button to reset iDRAC and to access BIOS using the step through mode.

For more information about the ports, see the Technical Specifications section.

Rear view of the system

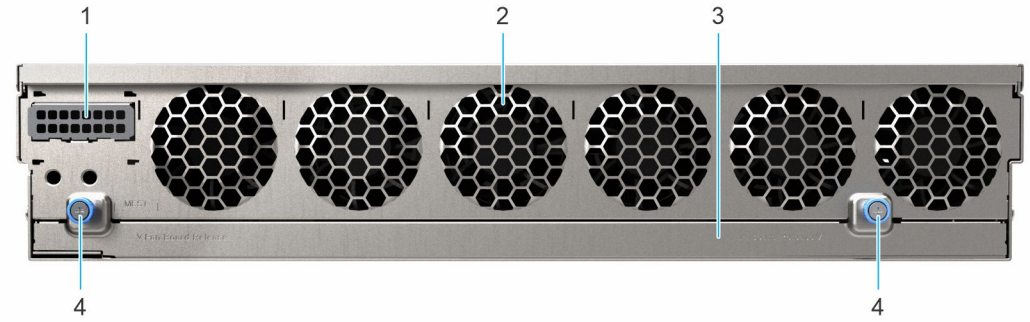


Figure 4. Rear view of the system

Table 4. Rear view of the system

Item	Ports, panels and slots	Icon	Description
1	Blank filler	N/A	This is a blank filler.
2	Cooling fan vents	N/A	These are the cooling fan vents.
3	Fan board tray	N/A	This is the tray which has the fan backplane. All the six fans are connected on the fan backplane.
4	Fan board securing thumbscrews	N/A	This is a thumbscrew that secures the fan board.

Inside the system

Figure 5. 2 x 2.5-inch Inside the system

1. Power supply units (2)
2. Primary drive bay assembly (2 drives)
3. GPU riser 2
4. GPU riser 1
5. Cooling fans (6)
6. System board
7. Cable holding latch

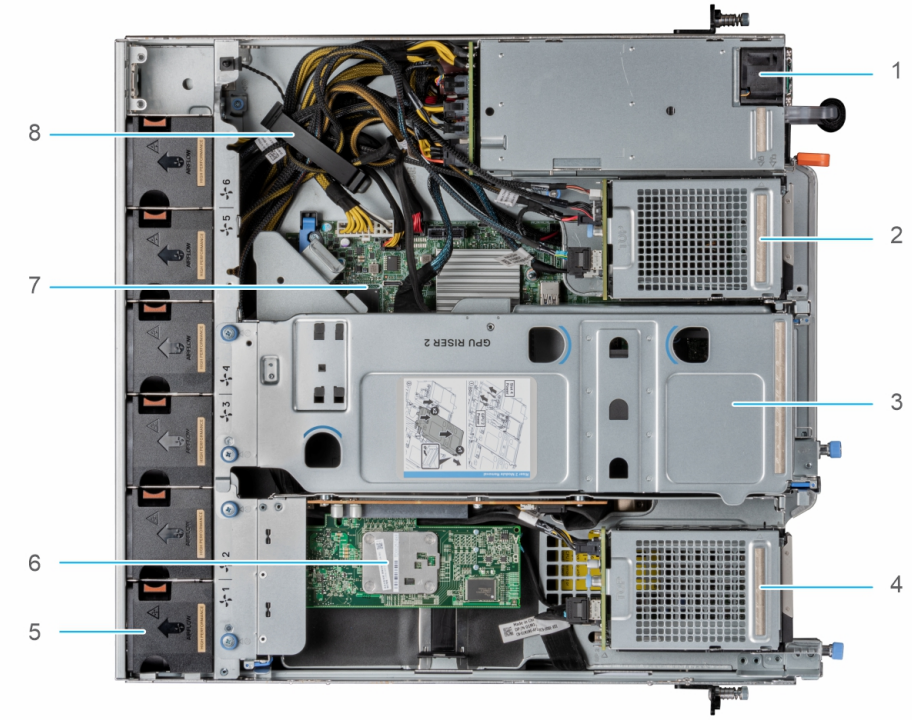


Figure 6. 4 x 2.5-inch Inside the system

1. Power supply units (2)
2. Primary drive bay assembly (2 drives)
3. GPU riser 2
4. Secondary drive bay assembly (2 drives)
5. Cooling fans (6)
6. Raid controller card
7. System board
8. Cable holding latch

Figure 7. 6 x EDSFF Inside the system

1. Power supply units (2)
2. EDSFF drive bay assembly
3. GPU riser 2
4. GPU riser 1
5. Cooling fans (6)

Locating the Express Service Code and Service Tag

The unique Express Service Code and Service Tag is used to identify the system.

The information tag is located on the that includes system information such as Service Tag, Express Service Code, Manufacture date, NIC, MAC address, QRL label, and so on. If you have opted for the secure default access to iDRAC, the Information tag also contains the iDRAC secure default password.

The Mini Enterprise Service Tag (MEST) label is located on the rear of the system that includes Service Tag (ST), Express Service Code (Exp Svc Code), and Manufacture Date (Mfg. Date). The Exp Svc Code is used by Dell EMC to route support calls to the appropriate personnel.

Alternatively, the Service Tag information is located on a label on left wall of the chassis.

System information label

The system information label is located on back side of the system cover.

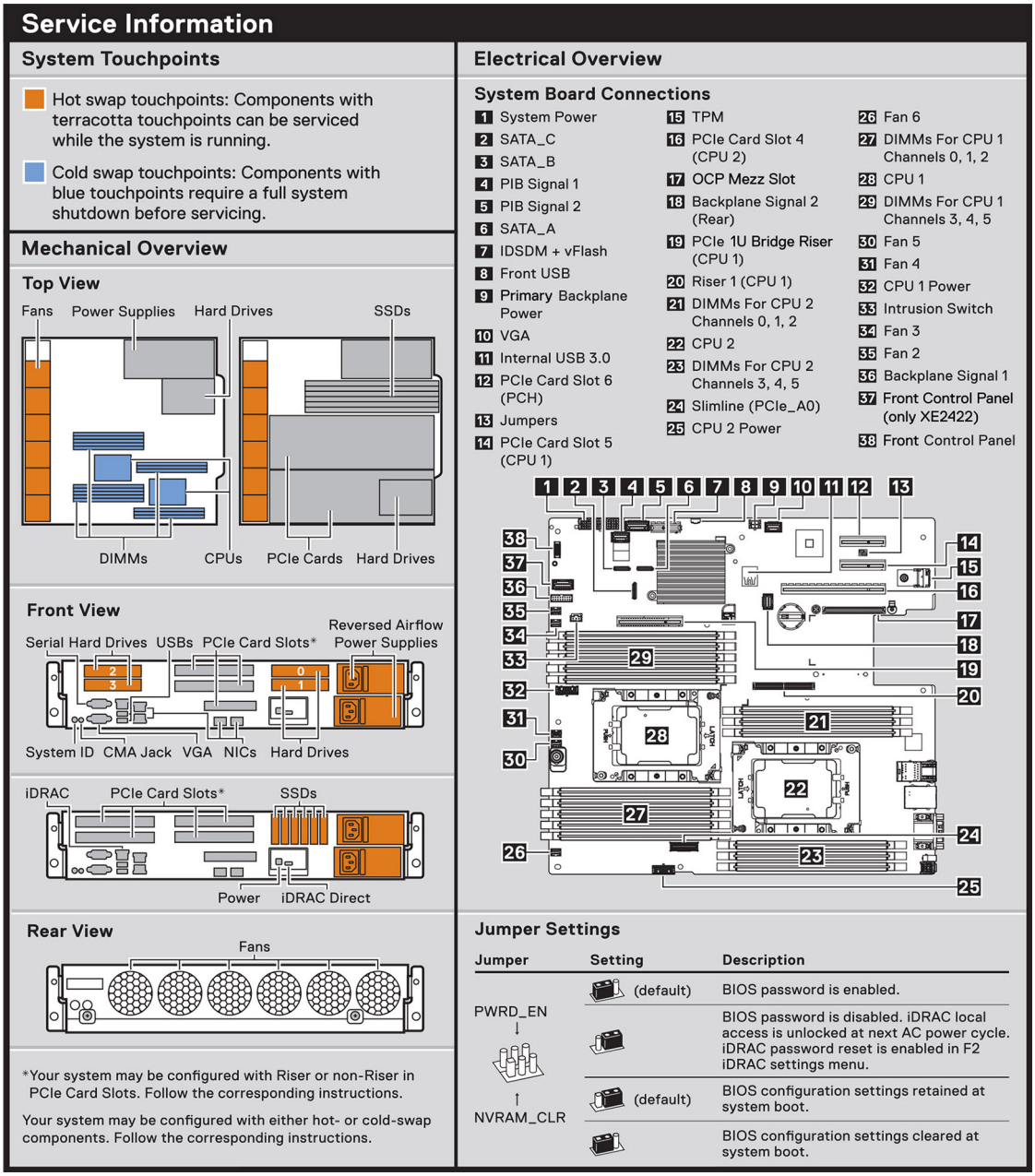


Figure 8. Service information

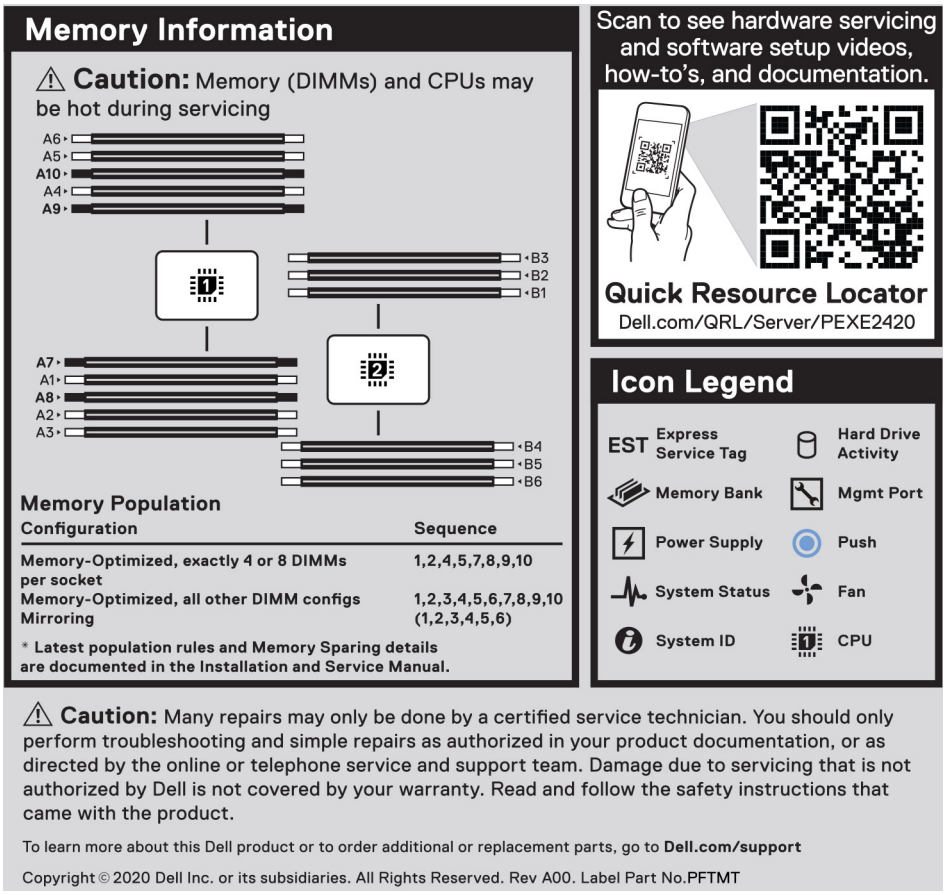


Figure 9. Memory information, QRL, and Icon legend

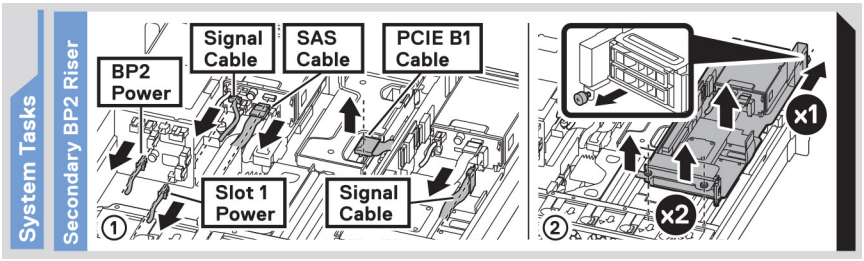


Figure 10. System task—Secondary BP2 riser

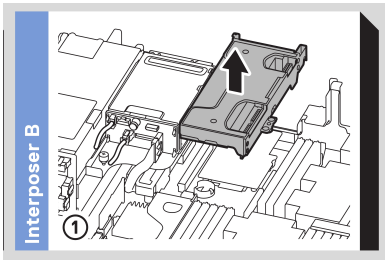


Figure 11. Interposer B

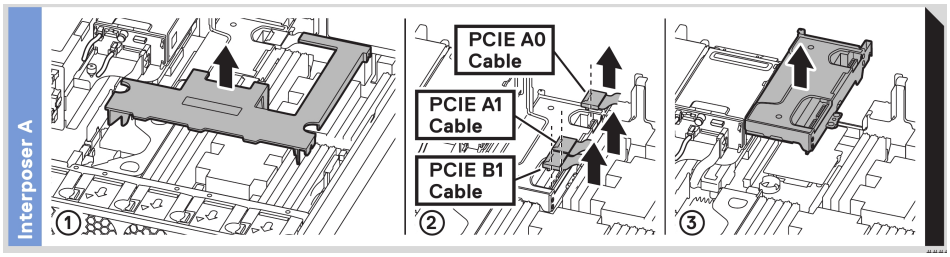


Figure 12. Interposer A

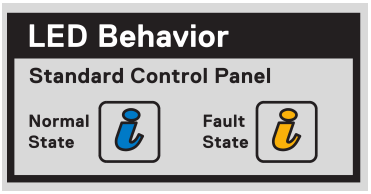


Figure 13. LED behavior

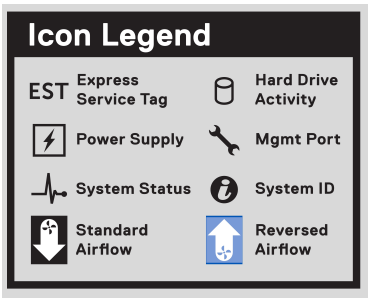


Figure 14. Icon legend

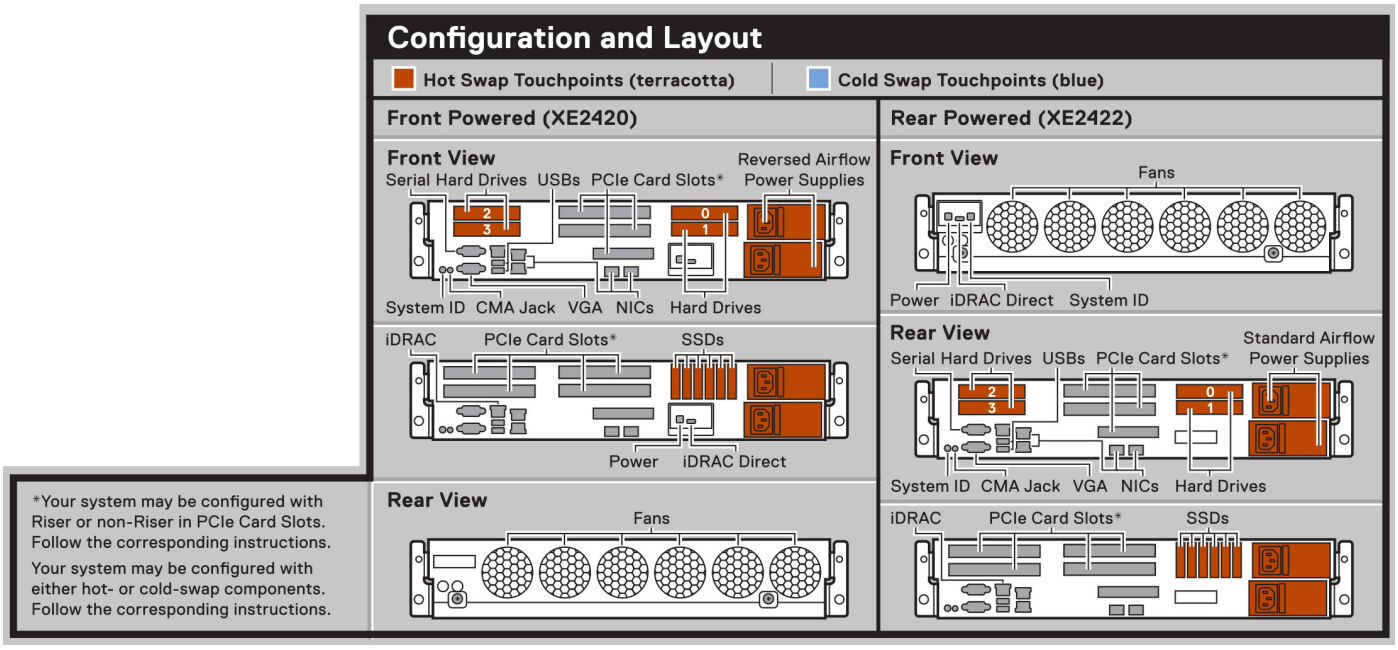


Figure 15. Configuration and layout

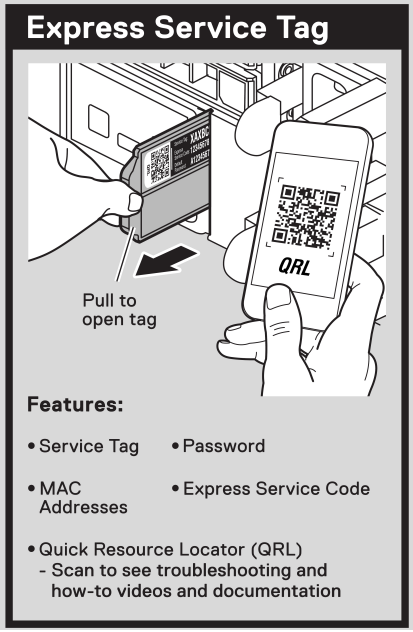


Figure 16. Express service tag

Rail sizing and rack compatibility matrix

For specific information about the rail solutions compatible with your system, refer to the *Dell EMC Enterprise Systems Rail Sizing and Rack Compatibility Matrix* available at https://i.dell.com/sites/csdocuments/Business_solutions_engineering-Docs_Documents/en/rail-rack-matrix.pdf.

The document provides the information listed below:

- Specific details about rail types and their functionalities
- Rail adjustability ranges for various rack mounting flange types
- Rail depth with and without cable management accessories
- Rack types supported for various rack mounting flange types

3

Initial system setup and configuration

This section describes the tasks for initial setup and configuration of the Dell EMC system. The sections provide general steps that you must complete to set up the system and the reference guides for detailed information.

Topics:

Setting up the system

Perform the following steps to set up the system:

Steps

1. Unpack the system.
2. Install the system into the rack. For more information see the rail installation and cable management accessory guides relevant to your rail and cable management solution at www.dell.com/dssmanuals.
3. Connect the peripherals to the system and the system to the electrical outlet.
4. Power on the system by pressing the power button.

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

iDRAC configuration

The Integrated Dell Remote Access Controller (iDRAC) is designed to make you more productive as a system administrator and improve the overall availability of Dell EMC servers. iDRAC alerts you to system issues, helps you to perform remote management, and reduces the need for physical access to the system.

Options to log in to iDRAC

To log in into the iDRAC Web User Interface, open a browser and enter the address IP.

You can log in to iDRAC as:

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

In the login screen displayed, if you have opted for secure default access to iDRAC, enter the iDRAC secure default password available on back side of the Information Tag. If you have not opted for secure default access to iDRAC, enter the default user name and password – `root` and `calvin`. You can also log in by using your Single Sign-On or Smart Card.

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

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/idracmanuals.

NOTE: To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article www.dell.com/support/article/sln308699.

You can also access iDRAC using command-line protocol - RACADM. For more information, see the *iDRAC with Lifecycle Controller RACADM CLI Guide* available at www.dell.com/idracmanuals

You can also access iDRAC using automation tool - Redfish API. For more information, see the *iDRAC9 with Lifecycle Controller Redfish API Guide* available at www.dell.com/idracmanuals

Resources to install operating system

If the system is shipped without an operating system, you can install a supported operating system by using one of the resources that are provided in the table. For information about how to install the operating system, see the documentation links provided in the table.

Table 5. Resources to install the operating system

Resource	Documentation links
iDRAC	*Integrated Dell Remote Access Controller User's Guide* at www.dell.com/idracmanuals
Lifecycle Controller	*Lifecycle Controller User's Guide* at www.dell.com/idracmanuals **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article at www.dell.com/support/article/sln308699.
OpenManage Deployment Toolkit	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Dell certified VMware ESXi	www.dell.com/virtualizationsolutions

NOTE: For more information about Installation and How-to videos for supported operating systems on PowerEdge system see, Supported Operating Systems for Dell EMC PowerEdge systems.

The PowerEdge XE2420 now supports iSM 3.5.1 for the following operating systems:

- Red Hat Enterprise Linux version 8.1
- VMware ESXi version 7.0
- Canonical Ubuntu Server LTS version 18.04
- Microsoft Windows Server 2019 with Hyper-V
- SUSE Linux Enterprise Server version 15 SP1
- VMware ESXi version 6.7U3

NOTE: Future iSM support depends on the new operating systems version validation.

For the iSM compatibility information and support matrix, see iSM user guide.

Options to download firmware

You can download firmware from Dell support site. For information, see the Downloading drivers and firmware section.

You can also choose any one of the following options to download the firmware. For information about how to download the firmware, see the documentation links provided in the table.

Table 6. Options to download firmware

Option	Documentation link
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 Deployment Toolkit (DTK)	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Using iDRAC virtual media	www.dell.com/idracmanuals

Options to download and install OS drivers

You can choose any one of the following options to download and install OS drivers. For information about how to download or install OS drivers, see the documentation links provided in the table.

Table 7. Options to download and install OS drivers

Option	Documentation
Dell EMC support site	Downloading drivers and firmware section.
iDRAC virtual media	*Integrated Dell Remote Access Controller User's Guide* at www.dell.com/idracmanuals or for system specific *Integrated Dell Remote Access Controller User's Guide*, go to www.dell.com/poweredgemanuals > **Product Support** page of your system > **Manuals & documents**. **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see www.dell.com/support/article/sln308699.

Downloading drivers and firmware

It is recommended that you download and install the latest BIOS, drivers, and systems management firmware on the system.

Prerequisites

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

Steps

1. Go to www.dell.com/support/drivers.
2. Enter the Service Tag of the system in the **Enter a Dell Service Tag, Dell EMC Product ID or Model** field, and then press Enter.

   NOTE: If you do not have the Service Tag, select **Detect PC** to automatically detect the Service Tag, or click **Browse all products**, and navigate to your product.

3. On the displayed product page, click **Drivers & Downloads**.
   On the **Drivers & Downloads** page, all drivers that are applicable to the system are displayed.
4. Download the drivers to a USB drive, CD, or DVD.

Channel Firmware Commodities

For edge workloads with unique requirements of front side serviceability, small form factor chassis, network acceleration, redundant network connectivity, and high capacity and dense storage the following commodities are enabled in the XE2420:

- Intel XXV710 Dual Port 10/25GbE SFP28 OCP NIC 2.0
- Intel FPGA Programmable Acceleration Card N3000 Full Height Bracket w/power cable
- Intel 15.3 TB, NVMe, E1.L, EDSFF, P4510, TLC
- NVMe M.2, PCIE Storage Option with 12 M.2 slots per Card
- NVMe M.2, PCIE Storage Option with 16 M.2 slots per Card
- NVMe M.2, PCIE Storage Option with 20 M.2 slots per Card
- Dual NVMe M.2, PCIE Storage Option with 12 M.2 slots per Card
- Dual NVMe M.2, PCIE Storage Option with 16 M.2 slots per Card
- Dual NVMe M.2, PCIE Storage Option with 20 M.2 slots per Card

NOTE: These commodities contain channel firmware and therefore do not have standard Dell systems management support including iDRAC, DUPs, and catalogs.

NOTE: Vendor tools are required to configure, deploy, manage, and update these commodities.

NOTE: Firmware that is shipped at the time of order is only the Dell validated version.

If an issue is reported to technical support on a later version flashed by the end user, the end user will must flash back to the shipped version to begin the root cause process. Best effort support will still be provided for non-Dell validated firmware versions.

iDRAC Reporting and Limitations

Intel XXV710 Dual Port 10/25GbE SFP28 OCP NIC 2.0

- Reference of NIC reported in iDRAC inventory.

Figure 17. NIC in iDRAC inventory

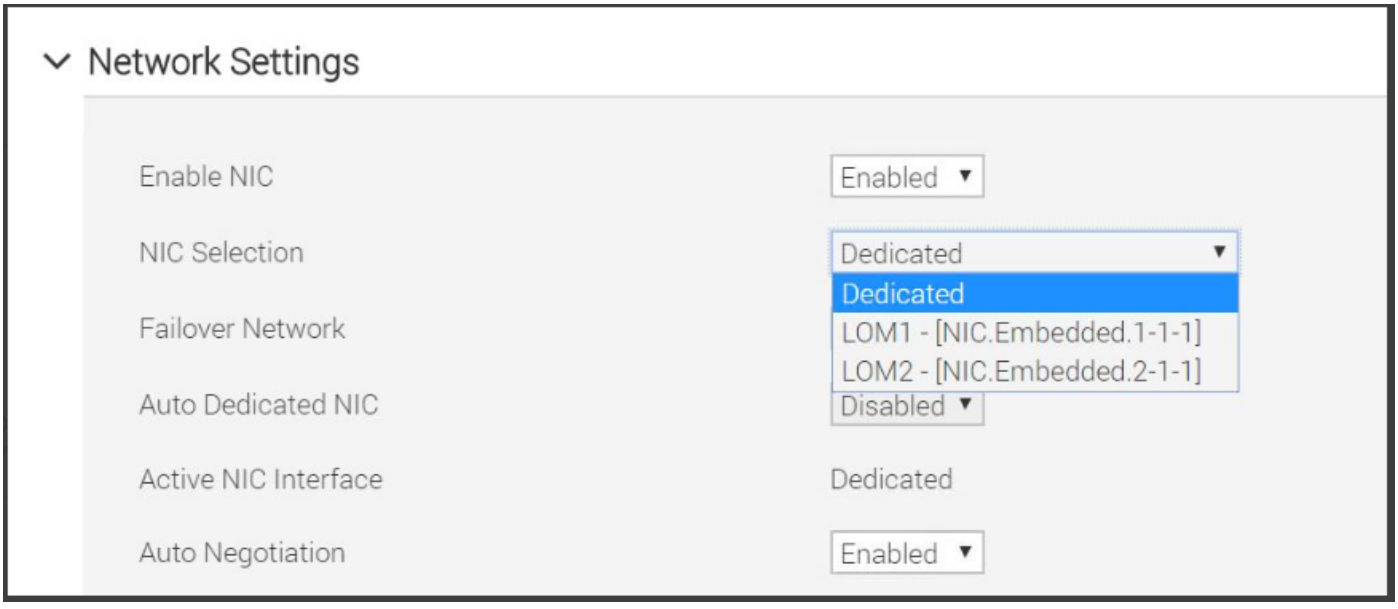


Figure 18. Shared NIC screen shot without Intel XXV710 OCP NIC 2.0 Listed

Intel XXV710 Dual Port is not listed in iDRAC selection page as shown, this NIC cannot be used as part of the shared NIC functionality.

Intel FPGA Programmable Acceleration Card N3000

- Reference of Intel card reported in iDRAC inventory.

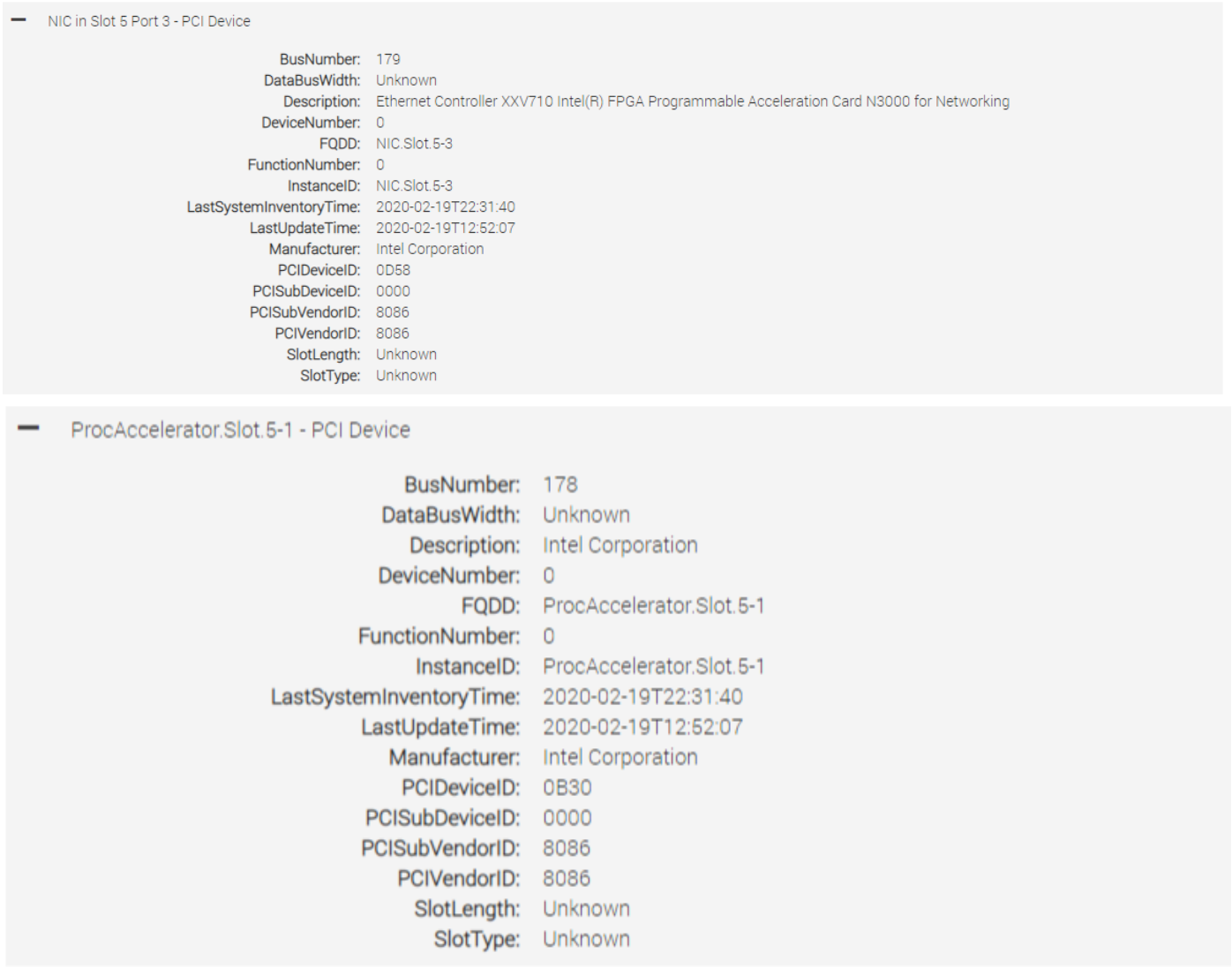


Figure 19. N3000 in iDRAC inventory

NVMe M.2, PCIe storage option with 12, 16 or 20 slots per card (Single and Dual)

- Reference of NVMe M.2, PCIe storage cards reported in iDRAC inventory.

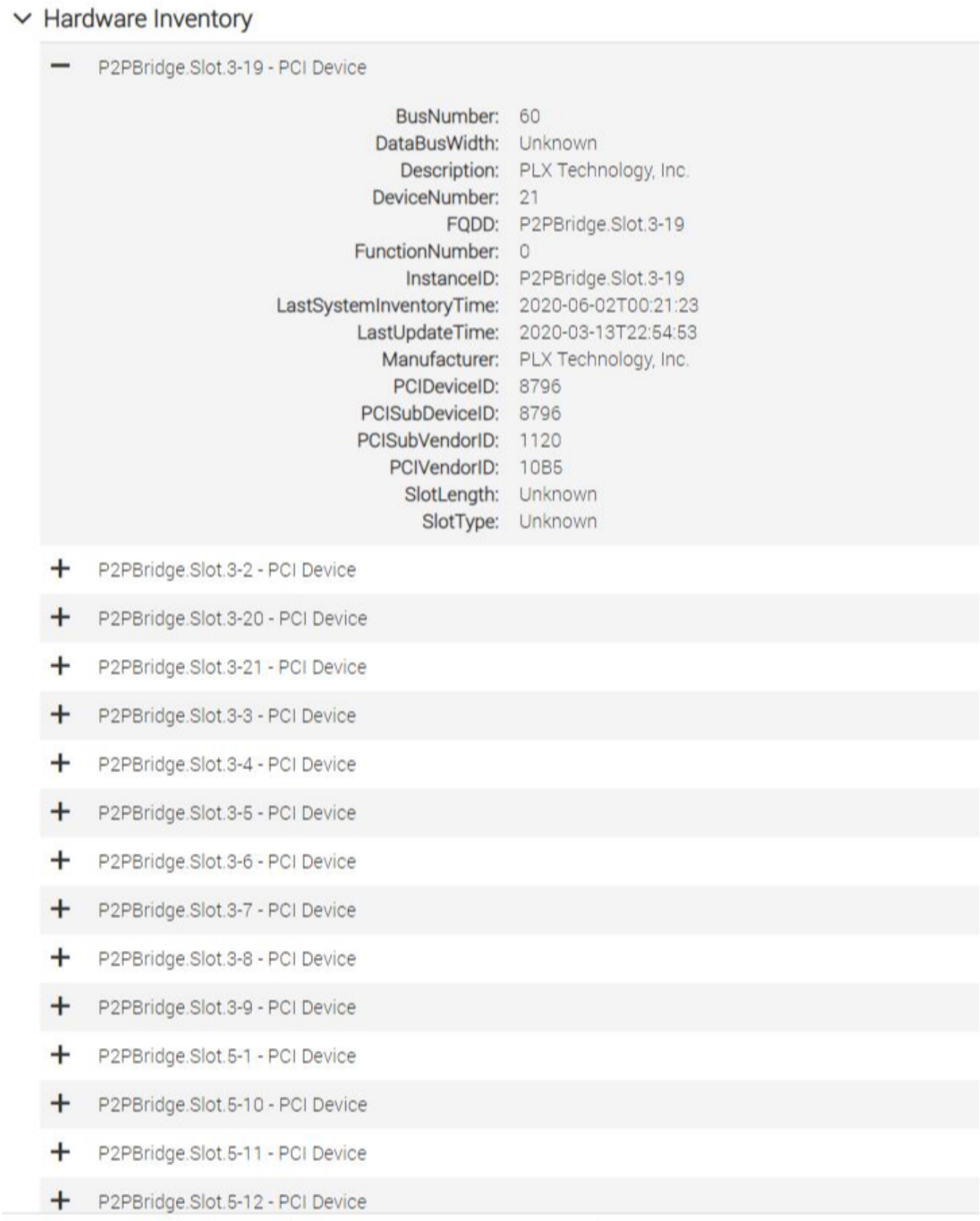


Figure 20. NVMe M.2, PCIe storage cards in iDRAC inventory

Adapter for NVMe M.2, PCIe storage option (Single and Dual)

- Reference of adapter for NVMe M.2, PCIe storage options reported in iDRAC inventory.

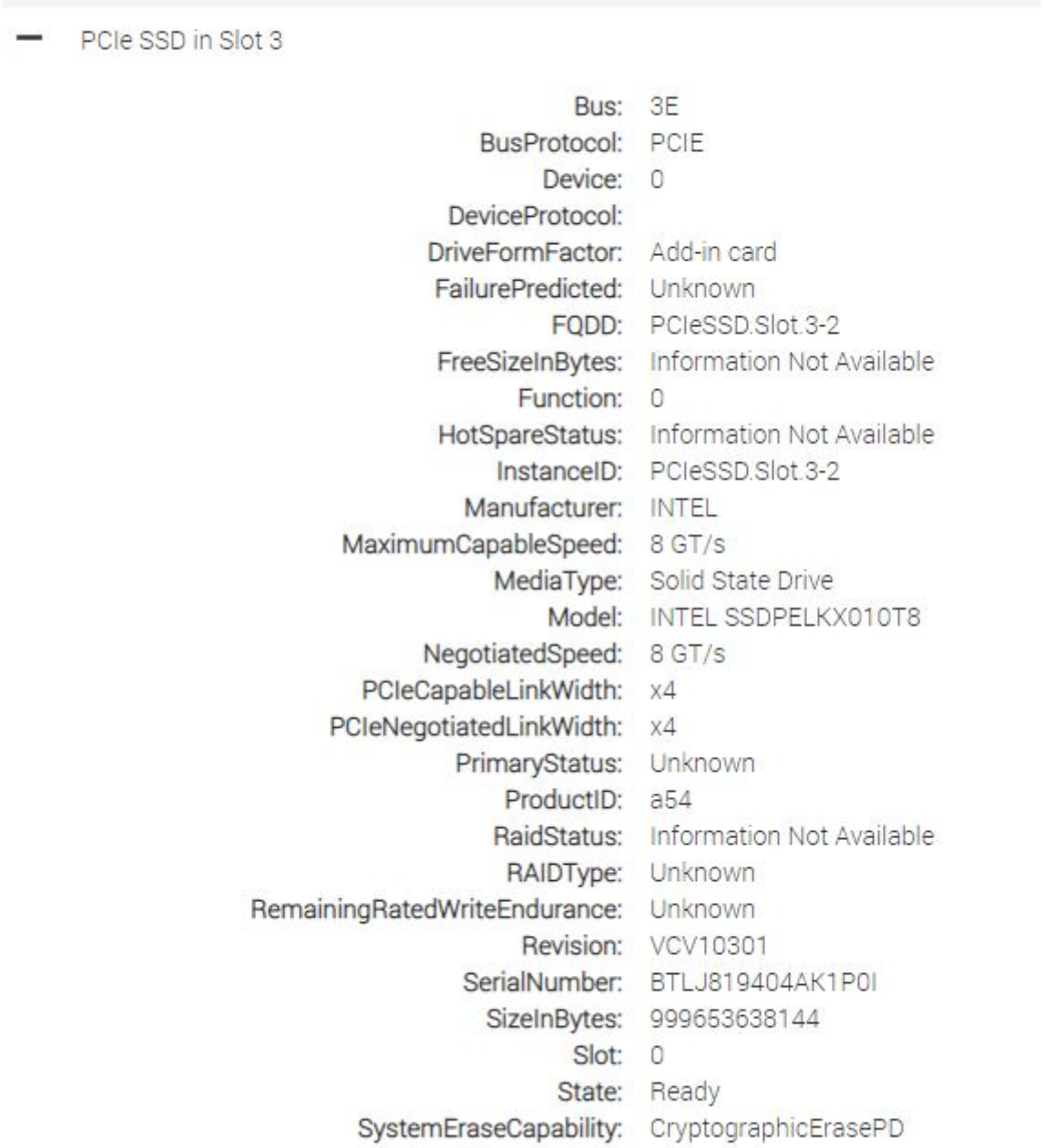


Figure 21. NVMe M.2, PCIe storage options in iDRAC inventory

NVMe M.2 SSDs

- All slots (12, 16, or 20 depending on the configuration) may not be displayed in iDRAC as shown below

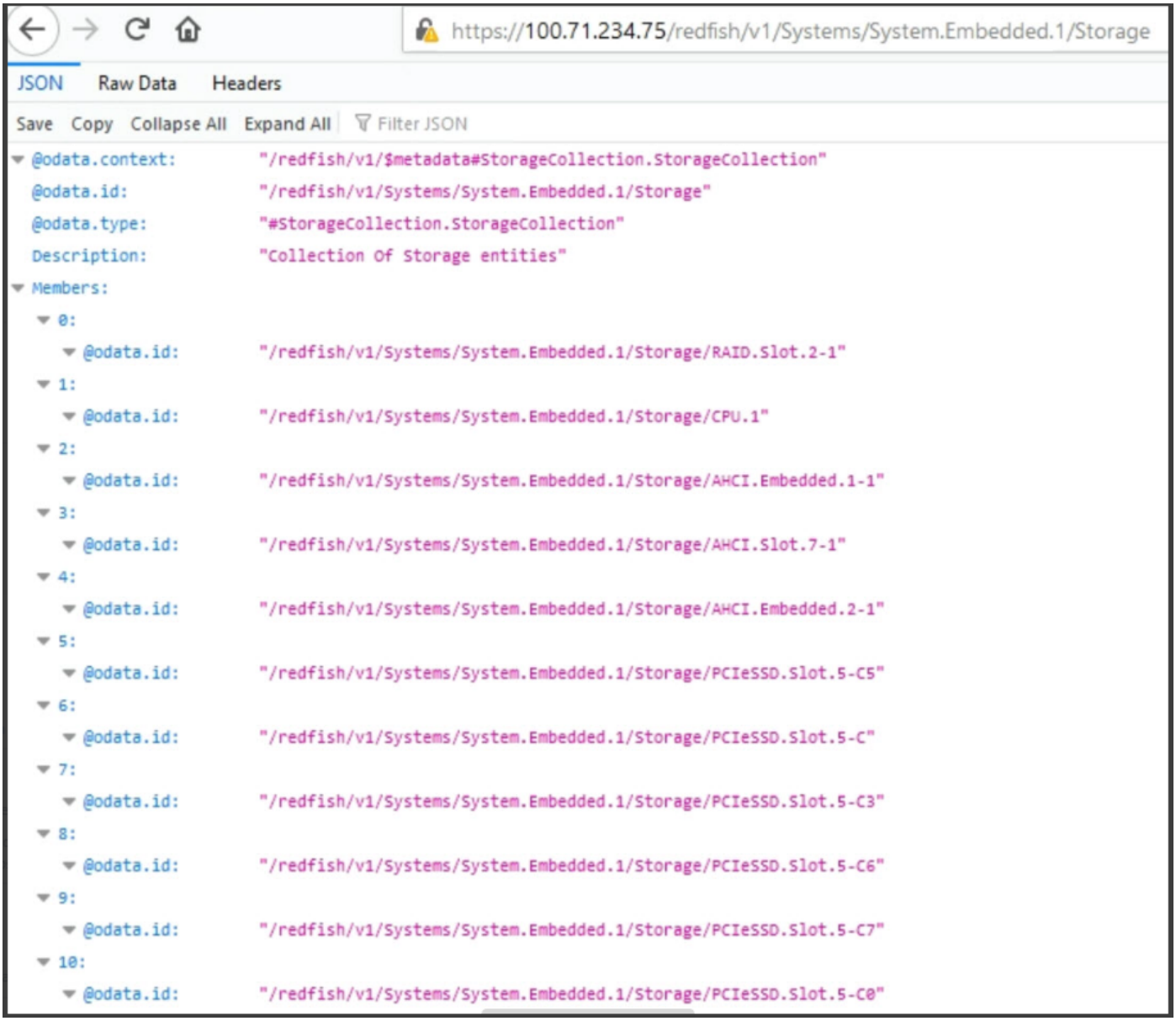


Figure 22. All slots

Intel 15.3 TB, NVMe, E1.L, EDSFF, P4510, TLC

- Reference of adapter for Intel 15.3 TB, NVMe, E1.L, EDSFF, P4510, TLC in iDRAC inventory.

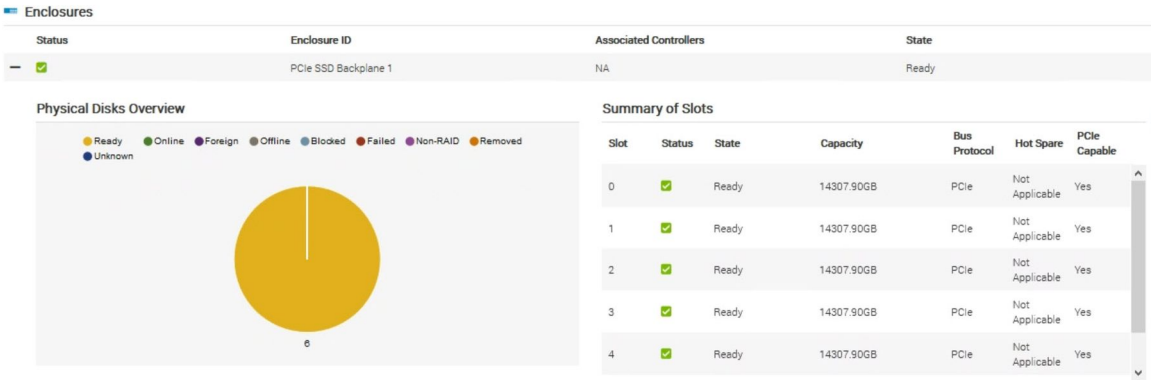


Figure 23. Storage enclosures in iDRAC inventory

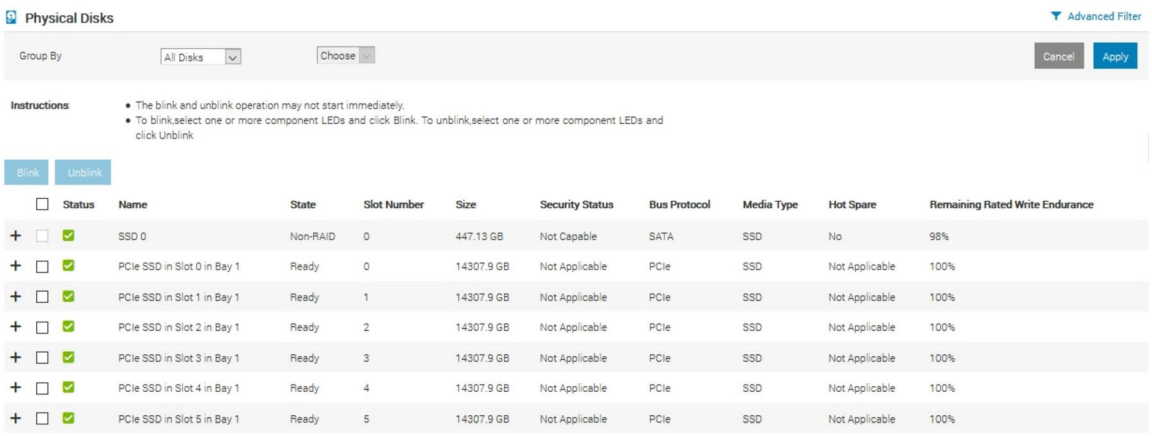


Figure 24. Physical disks in iDRAC inventory

Figure 25. Hardware inventory in iDRAC inventory

Firmware Inventory

Component	FW Version
Power Supply.Slot.1	00.02.19
Power Supply.Slot.2	00.02.19
Integrated Dell Remote Access Controller	4.00.129.00
Broadcom Gigabit Ethernet BCM5720 - 4C:D9:8F:98:03:17	20.6.16
Broadcom Adv. Dual 10G SFP+ Ethernet - 4C:D9:8F:8A:93:0D	21.60.29.38
Broadcom Adv. Dual 10G SFP+ Ethernet - 4C:D9:8F:8A:93:0C	21.60.29.38
Broadcom Gigabit Ethernet BCM5720 - 4C:D9:8F:98:03:18	20.6.16
BIOS	1.1.7
BOSS-S1	2.6.13.3024
PCIe SSD in Slot 5 in Bay 1	8DV10510
PCIe SSD in Slot 2 in Bay 1	8DV10510
PCIe SSD in Slot 4 in Bay 1	8DV10510
PCIe SSD in Slot 3 in Bay 1	8DV10510
PCIe SSD in Slot 1 in Bay 1	8DV10510
PCIe SSD in Slot 0 in Bay 1	8DV10510

Figure 26. Firmware inventory in iDRAC inventory

NOTE: Cryptographic erase using Lifecycle Controller is not supported, vendor tools can be used for cryptographic erase.

Vendor tools

The vendor tools required to support these commodities are on the vendor websites. The html file to guide users to the correct website is found in the SWB for each commodity instead of the DUPS normally found in the SWB for PowerEdge commodities.

For the latest drivers and firmware's see www.dell.com/support/drivers

Systems Management Support

See the systems management support matrix below for each channel commodity.

<table>
<tr><th>Product</th><th>Intel XXV710 Dual Port 10/25GbE SFP28 OCP NIC 2.0</th><th>Intel FPGA Programmable Acceleration Card N3000</th><th>Intel 15.3 TB, NVMe, E1.L, EDSFF</th><th>NVMe M.2, PCIE Storage Option with 12, 16 or 20 slots per card (Single and Dual)</th></tr>
<tr><td colspan="5">iDRAC Licensing</td></tr>
<tr><td>Enterprise License</td><td colspan="4" rowspan="3">Not supported</td></tr>
<tr><td>Data Center License</td></tr>
<tr><td>iDRAC Service Module</td></tr>
<tr><td colspan="5">Change Management</td></tr>
<tr><td>DUPs and Catalogs</td><td>Supported</td><td colspan="3" rowspan="3">Not supported</td></tr>
<tr><td>Dell System Update (DSU)OpenManage Server Administrator</td><td rowspan="2">Not supported</td></tr>
<tr><td>Dell Repository Manager (DRM)</td></tr>
</table>

Product	Intel XXV710 Dual Port 10/25GbE SFP28 OCP NIC 2.0	Intel FPGA Programmable Acceleration Card N3000	Intel 15.3 TB, NVMe, E1.L, EDSFF	NVMe M.2, PCIE Storage Option with 12, 16 or 20 slots per card (Single and Dual)
Server Update Utility (SUU)				
Bootable ISO				
Lifecycle Controller Driver Pack				
OpenManage Server Administrator				
Consoles				
OpenManage Enterprise	Not supported			
OpenManage Essentials				
Power Manager Plug-In				
Integrations				
VMware (OMIVV)	Not supported			
Microsoft				
Security Capabilities				
Secure Enterprise Key Manager (SED support)	Not supported			
CloudLink				
Services Implementations				
SupportAssist for Enterprise	Not supported			
ServiceNow				
Ansible Enablement				
Mobility Offers				
Quicksync2	Not supported			
Third-party Connectors (Nagios, Tivoli, CA, etc).				

4

Pre-operating system management applications

You can manage basic settings and features of a system without booting to the operating system by using the system firmware.

Options to manage the pre-operating system applications

You can use any one of the following options to manage the pre-operating system applications:

- System Setup
- Dell Lifecycle Controller
- Boot Manager
- Preboot Execution Environment (PXE)

Topics:

System Setup

Using the **System Setup** option, you can configure the BIOS settings, iDRAC settings, and device settings of the system.

You can access system setup by using any one of the following interfaces:

- Graphical User interface — To access go to iDRAC Dashboard, click **Configuration**, and click **BIOS Settings**.
- Text browser — The browser is enabled by using Console Redirection.

To view **System Setup**, power on the system, press F2, and click **System Setup Main Menu**.

NOTE: If the operating system begins to load before you press F2, wait for the system to finish booting, and then restart the system and try again.

The **System Setup Main Menu** screen details are described as follows:

Table 8. System Setup Main Menu

Option	Description
System BIOS	Enables you to configure the BIOS settings.
iDRAC Settings	Enables you to configure the iDRAC settings. The iDRAC settings utility is an interface to set up and configure the iDRAC parameters by using UEFI (Unified Extensible Firmware Interface). You can enable or disable various iDRAC parameters by using the iDRAC settings utility. For more information about this utility, see *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/idracmanuals.
Device Settings	Enabled you to configure device settings for devices such as storage controllers or network cards.

System BIOS

To view the **System BIOS** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS**.

Table 9. System BIOS details

Option	Description
System Information	Provides information about the system such as the system model name, BIOS version, and Service Tag.
Memory Settings	Specifies information and options related to the installed memory.
Processor Settings	Specifies information and options related to the processor such as speed and cache size.
SATA Settings	Specifies options to enable or disable the integrated SATA controller and ports.
NVMe Settings	Specifies options to change the NVMe settings. If the system contains the NVMe drives that you want to configure in a RAID array, you must set both this field and the **Embedded SATA** field on the **SATA Settings** menu to **RAID** mode. You might also need to change the **Boot Mode** setting to **UEFI**. Otherwise, you should set this field to **Non-RAID** mode.
Boot Settings	Specifies options to specify the Boot mode (BIOS or UEFI). Enables you to modify UEFI and BIOS boot settings.
Network Settings	Specifies options to manage the UEFI network settings and boot protocols. Legacy network settings are managed from the **Device Settings** menu. **NOTE:** Network Settings are not supported in BIOS boot mode.
Integrated Devices	Specifies options to manage integrated device controllers and ports, specifies related features, and options.
Serial Communication	Specifies options to manage the serial ports, its related features, and options.
System Profile Settings	Specifies options to change the processor power management settings, memory frequency.
System Security	Specifies options to configure the system security settings, such as system password, setup password, Trusted Platform Module (TPM) security, and UEFI secure boot. It also manages the power button on the system
Redundant OS Control	Sets the redundant OS information for redundant OS control.
Miscellaneous Settings	Specifies options to change the system date and time.

System Information

To view the **System Information** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **System Information**.

Table 10. System Information details

Option	Description
System Model Name	Specifies the system model name.
System BIOS Version	Specifies the BIOS version installed on the system.
System Management Engine Version	Specifies the current version of the Management Engine firmware.
System Service Tag	Specifies the system Service Tag.
System Manufacturer	Specifies the name of the system manufacturer.
System Manufacturer Contact Information	Specifies the contact information of the system manufacturer.

Table 10. System Information details (continued)

Option	Description
System CPLD Version	Specifies the current version of the system complex programmable logic device (CPLD) firmware.
UEFI Compliance Version	Specifies the UEFI compliance level of the system firmware.

Memory Settings

To view the **Memory Settings** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **Memory Settings**.

Table 11. Memory Settings details

Option	Description
System Memory Size	Specifies the memory size in the system.
System Memory Type	Specifies the type of memory installed in the system.
System Memory Speed	Specifies the system memory speed.
System Memory Voltage	Specifies the system memory voltage.
Video Memory	Specifies the amount of video memory.
System Memory Testing	Specifies whether the system memory tests are run during system boot. The two options available are **Enabled** and **Disabled**. This option is set to **Disabled** by default.
Memory Operating Mode	Specifies the memory operating mode. The options is available are **Optimizer Mode, Single Rank Spare Mode, Multi Rank Spare Mode, and Mirror Mode**. This option is set to **Optimizer Mode**, by default. **NOTE:** The **Memory Operating Mode** option can have different default and available options depending on the memory configuration of your system.
Current State of Memory Operating Mode	Specifies the current state of the memory operating mode.
Node interleaving	Specifies if Non-Uniform Architecture (NUMA) is supported. If this field is set to **Enabled**, memory interleaving is supported if a symmetric memory configuration is installed. If this field is set to **Disabled**, the system supports NUMA (asymmetric) memory configurations. This option is **Disabled** by default.
ADDDC Setting	Enables or disables **ADDDC Setting** feature. When Adaptive Double DRAM Device Correction (ADDDC) is enabled, failing DRAM's are dynamically mapped out. When set to **Enabled** it can have impact to system performance under certain workloads. This feature is applicable for x4 DIMMs only. This option is set to **Enabled** by default.
Native tRFC Timing for 16 Gb DIMMs	Enables 16 Gb density to operate at their programmed Row Refresh Cycle Time (tRFC). Enabling this feature may improve system performance for some configurations. However, enabling this feature has no effect on configurations with 16 Gb 3DC/TSV DIMMs. This option is set to **Disabled** by default.
Opportunistic Self-Refresh	Enables or disables opportunistic self-refresh feature. This option is set to **Disabled** by default and is not supported when DCPMM(s) are in the system.
Correctable Error Logging	Enables or disables logging of correctable memory threshold error. This option is set to **Enabled** by default.

Processor Settings

To view the **Processor Settings** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **Processor Settings**.

Table 12. Processor Settings details

Option	Description
Logical Processor	Enables or disables the logical processors and displays the number of logical processors. If this option is set to **Enabled**, the BIOS displays all the logical processors. If this option is set to **Disabled**, the BIOS displays only one logical processor per core. This option is set to **Enabled** by default.
CPU Interconnect Speed	Enables you to govern the frequency of the communication links among the processors in the system. **NOTE:** The standard and basic bin processors support lower link frequencies. The options available are **Maximum data rate, 10.4 GT/s, and 9.6 GT/s.** This option is set to **Maximum data rate** by default.
Virtualization Technology	Enable or Disable the virtualization technology for the processor. This option is set to **Enabled** by default.
Adjacent Cache Line Prefetch	Optimizes the system for applications that need high utilization of sequential memory access. This option is set to **Enabled** by default. You can disable this option for applications that need high utilization of random memory access.
Hardware Prefetcher	Enables or disables the hardware prefetcher. This option is set to **Enabled** by default.
Software Prefetcher	Enables or disables the software prefetcher. This option is set to **Enabled** by default.
DCU IP Prefetcher	Enables or disables the Data Cache Unit (DCU) IP prefetcher. This option is set to **Enabled** by default.
Sub NUMA Cluster	Enables or disables the Sub NUMA Cluster. This option is set to **Disabled** by default.
UPI Prefetch	Enables you to get the memory that is read started early on DDR bus. The Ultra Path Interconnect (UPI) Rx path will spawn the speculative memory that is read Integrated Memory Controller (iMC) This option is **Enabled** by default.
LLC Prefetch	Enable or disable the LLC Prefetch on all threads. This option is set to **Disabled** by default.
Dead Line LLC Alloc	Enable or disable the LLC Alloc. This option is set to **Enabled** by default.
Directory AtoS	Enable or disable the Directory A to S. This option is set to **Disabled** by default.
Logical Processor Idling	Enables you to improve the energy efficiency of a system . It uses the operating system core parking algorithm and parks some of the logical processors in the system which in turn allows the corresponding processor cores to transition into a lower power idle state. This option can only be enabled if the operating system supports it. It is set to **Disabled** by default.
Configurable TDP	Enables you to configure the TDP level. The available options are **Nominal**, **Level 1**, and **Level 2**. This option is set to **Nominal** by default.

Table 12. Processor Settings details (continued)

Option	Description
	NOTE: This option is only available on certain stock keeping units (SKUs) of the processors.
x2APIC Mode	Enables or disables the x2APIC mode. This option is set to **Enabled** by default.
Processor Core speed	Specifies the maximum core frequency of the processor.
Processor Bus speed	Displays the bus speed of the processor.
Processor n	**NOTE:** Depending on the number of CPUs, there might be up to n processors listed. The following settings are displayed for each processor installed in the system:

Table 13. Processor n details

Option	Description
Family-Model-Stepping	Specifies the family, model, and stepping of the processor as defined by Intel.
Brand	Specifies the brand name.
Level 2 Cache	Specifies the total L2 cache.
Level 3 Cache	Specifies the total L3 cache.
Number of Cores	Specifies the number of cores per processor.
Maximum Memory Capacity	Specifies the maximum memory capacity per processor.
Microcode	Specifies the processor microcode version.

SATA Settings

To view the **SATA Settings** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **SATA Settings**.

Table 14. SATA Settings details

Option	Description
Embedded SATA	Enables the embedded SATA option to be set to **AHCI mode** , or **RAID modes**. This option is set to **AHCI Mode** by default. **NOTE:** 1. You might also need to change the Boot Mode setting to UEFI. Otherwise, you should set the field to Non-RAID mode. 2. No ESXi and Ubuntu OS support under RAID mode.
Security Freeze Lock	Sends **Security Freeze Lock** command to the embedded SATA drives during POST. This option is applicable only for AHCI Mode. This option is set to **Enabled** by default.
Write Cache	Enables or disables the command for the embedded SATA drives during POST. This option is set to **Disabled** by default.
Port n	Sets the drive type of the selected device. For **AHCI Mode** or **RAID Mode**, BIOS support is always enabled.

Table 14. SATA Settings details (continued)

Option	Description
	Table 15. Port n

Options	Descriptions
Model	Specifies the drive model of the selected device.
Drive Type	Specifies the type of drive attached to the SATA port.
Capacity	Specifies the total capacity of the drive. This field is undefined for removable media devices such as optical drives.

NVMe Settings

This option sets the NVMe drive mode. If the system contains NVMe drives that you want to configure in a RAID array, you must set both this field and the Embedded SATA field on the SATA settings menu to RAID Mode. You may also need to change the Boot Mode setting to UEFI. The option is set to **Non-RAID** mode by default.

Boot Settings

You can use the **Boot Settings** screen to set the boot mode to either **BIOS** or **UEFI**. It also enables you to specify the boot order.

- **UEFI**: The Unified Extensible Firmware Interface (UEFI) is a new interface between operating systems and platform firmware. The interface consists of data tables with platform related information, boot and runtime service calls that are available to the operating system and its loader. The following benefits are available when the **Boot Mode** is set to **UEFI**:
  - Support for drive partitions larger than 2 TB.
  - Enhanced security (e.g., UEFI Secure Boot).
  - Faster boot time.

  NOTE: You must use only the UEFI boot mode in order to boot from NVMe drives.
- **BIOS**: The **BIOS Boot Mode** is the legacy boot mode. It is maintained for backward compatibility.

To view the **Boot Settings** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **Boot Settings**.

Table 16. Boot Settings details

Option	Description
Boot Mode	Enables you to set the boot mode of the system. If the operating system supports UEFI, you can set this option to UEFI. Setting this field to BIOS allows compatibility with non-UEFI operating systems. This option is set to **UEFI** by default. **CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.** **NOTE:** Setting this field to UEFI disables the **BIOS Boot Settings** menu.
Boot Sequence Retry	Enables or disables the **Boot Sequence Retry** feature. If this option is set to **Enabled** and the system fails to boot, the system re-attempts the boot sequence after 30 seconds. This option is set to **Enabled** by default.
Hard-disk Failover	Enables or disables the Hard-disk failover. This option is set to **Disabled** by default.
Generic USB Boot	Enables or disables the generic USB boot placeholder. This option is set to **Disabled** by default.

Table 16. Boot Settings details (continued)

Option	Description
Hard-disk Drive Placeholder	Enables or disables the Hard-disk drive placeholder. This option is set to **Disabled** by default.
BIOS Boot Settings	Enables or disables BIOS boot options. **NOTE:** This option is enabled only if the boot mode is BIOS.
UEFI Boot Settings	Specifies the UEFI boot sequence. Enables or disables UEFI Boot options. The Boot options include IPv4 PXE and IPv6 PXE. This option is set to IPv4 by default. **NOTE:** This option is enabled only if the boot mode is UEFI. **NOTE:** This option controls the UEFI boot order. The first option in the list will be attempted first.

Table 17. UEFI Boot Settings

Option	Description
UEFI Boot Sequence	Enables you to change the boot device order.
Boot Options Enable/Disable	Enables you to select the enabled or disabled boot devices

Choosing system boot mode

System Setup enables you to specify one of the following boot modes for installing your operating system:

- UEFI boot mode (the default), is an enhanced 64-bit boot interface.

  If you have configured your system to boot to UEFI mode, it replaces the system BIOS.

1. From the **System Setup Main Menu**, click **Boot Settings**, and select **Boot Mode**.
2. Select the UEFI boot mode you want the system to boot into.

   CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.
3. After the system boots in the specified boot mode, proceed to install your operating system from that mode.

NOTE: Operating systems must be UEFI-compatible to be installed from the UEFI boot mode. DOS and 32-bit operating systems do not support UEFI and can only be installed from the BIOS boot mode.

NOTE: For the latest information about supported operating systems, go to www.dell.com/ossupport.

Changing boot order

About this task

You may have to change the boot order if you want to boot from a USB key or an optical drive. The following instructions may vary if you have selected **BIOS** for **Boot Mode**.

NOTE: Changing the drive boot sequence is only supported in BIOS boot mode.

Steps

1. On the **System Setup Main Menu** screen, click **System BIOS** > **Boot Settings** > **UEFI Boot Settings** > **UEFI Boot Sequence**.
2. Use the arrow keys to select a boot device, and use the plus (+) and minus (-) sign keys to move the device down or up in the order.
3. Click **Exit**, and then click **Yes** to save the settings on exit.

NOTE: You can also enable or disable boot order devices as needed.

Network Settings

To view the **Network Settings** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **Network Settings**.

NOTE: Network Settings are not supported in BIOS boot mode.

Table 18. Network Settings details

Option	Description
UEFI PXE Settings	Enables you to control the configuration of the UEFI PXE device.
PXE Device n (n = 1 to 4)	Enables or disables the device. When enabled, a UEFI PXE boot option is created for the device.
PXE Device n Settings(n = 1 to 4)	Enables you to control the configuration of the PXE device.
UEFI HTTP Settings	Enables you to control the configuration of the UEFI HTTP device.
HTTP Device n (n = 1 to 4)	Enables or disables the device. When enabled, a UEFI HTTP boot option is created for the device.
HTTP Device n Settings (n = 1 to 4)	Enables you to control the configuration of the HTTP device.
UEFI iSCSI Settings	Enables you to control the configuration of the iSCSI device.
TLS Authentication Configuration	View and/or modify this device's boot TLS authentication mode. **None** means the HTTP server and the client will not authenticate each other for this boot. **One way** means the HTTP server will be authenticated by the client, while the client will not be authenticated by the server. This option is set to **None** by default.

Table 19. PXE Device n Settings details

Option	Description
Interface	Specifies NIC interface used for the PXE device.
Protocol	Specifies Protocol used for PXE device. This option is set to **IPv4** or **IPv6**. This option is set to **IPv4** by default.
Vlan	Enables Vlan for PXE device. This option is set to **Enable** or **Disable**. This option is set to **Disable** by default.
Vlan ID	Shows the Vlan ID for the PXE device
Vlan Priority	Shows the Vlan Priority for the PXE device.

Table 20. HTTP Device n Settings details

Option	Description
Interface	Specifies NIC interface used for the HTTP device.
Protocol	Specifies Protocol used for HTTP device. This option is set to **IPv4** or **IPv6**. This option is set to **IPv4** by default.
Vlan	Enables Vlan for HTTP device. This option is set to **Enable** or **Disable**. This option is set to **Disable** by default.
Vlan ID	Shows the Vlan ID for the HTTP device
Vlan Priority	Shows the Vlan Priority for the HTTP device.
DHCP	Enables or disables DHCP for this HTTP device. This option is set to **Enable** by default.
IP Address	Specifies IP address for the HTTP device.

Table 20. HTTP Device n Settings details (continued)

Option	Description
Subnet Mask	Specifies subnet mask for the HTTP device.
Gateway	Specifies gateway for the HTTP device.
DNS info via DHCP	Enables or disables DNS Information from DHCP. This option is set to **Enable** by default.
Primary DNS	Specifies the primary DNS server IP address for the HTTP Device.
Secondary DNS	Specifies the secondary DNS server IP address for the HTTP Device.
URI	Obtain URI from the DHCP server if not specified

Table 21. UEFI iSCSI Settings screen details

Option	Description
iSCSI Initiator Name	Specifies the name of the iSCSI initiator in IQN format.
iSCSI Device1	Enables or disables the iSCSI device. When disabled, a UEFI boot option is created for the iSCSI device automatically. This is set to **Disabled** by default.
iSCSI Device1 Settings	Enables you to control the configuration of the iSCSI device.

Table 22. ISCSI Device1 Settings screen details

Option	Description
Connection 1	Enables or disables the iSCSI connection. This option is set to **Disable** by default.
Connection 2	Enables or disables the iSCSI connection. This option is set to **Disable** by default.
Connection 1 Settings	Enables you to control the configuration for the iSCSI connection.
Connection 2 Settings	Enables you to control the configuration for the iSCSI connection.
Connection Order	Enables you to control the order for which the iSCSI connections will be attempted.

Integrated Devices

To view the **Integrated Devices** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **Integrated Devices**.

Table 23. Integrated Devices details

Option	Description
User Accessible USB Ports	Configures the user accessible USB ports. Selecting **Only Back Ports On** disables the front USB ports; selecting **All Ports Off** disables all front and back USB ports. This option is set to **All Ports On** by default. The USB keyboard and mouse still function in certain USB ports during the boot process, depending on the selection. After the boot process is complete, the USB ports will be enabled or disabled as per the setting.
Internal USB Port	Enables or disables the **Internal USB Port**. This option is set to **On** or **Off**. This option is set to **On** by default. **NOTE:** The Internal SD Card Port on the PCIe riser is controlled by Internal USB Port.
iDRAC Direct USB Port	The iDRAC Direct USB port is managed by iDRAC exclusively with no host visibility. This option is set to **ON** or **OFF**. When set to **OFF**, iDRAC does not detect any USB devices installed in this managed port. This option is set to **On** by default.

Table 23. Integrated Devices details (continued)

Option	Description
Integrated RAID Controller	Enables or disables the integrated RAID controller. This option is set to **Enabled** by default.
Embedded NIC1 and NIC2	Enables or disables the **Embedded NIC1 and NIC2** options. If set to **Disabled (OS)**, the NIC may still be available for shared network access by the embedded management controller. Configure the **Embedded NIC1 and NIC2** option by using the NIC management utilities of the system.
I/OAT DMA Engine	Enables or disables the I/O Acceleration Technology (I/OAT) option. I/OAT is a set of DMA features designed to accelerate network traffic and lower CPU utilization. Enable only if the hardware and software support the feature. This option is set to **Disabled** by default.
Embedded Video Controller	Enables or disables the use of Embedded Video Controller as the primary display. When set to **Enabled**, the Embedded Video Controller will be the primary display even if add-in graphic cards are installed. When set to **Disabled**, an add-in graphics card will be used as the primary display. BIOS will output displays to both the primary add-in video and the embedded video during POST and pre-boot environment. The embedded video will then be disabled right before the operating system boots. This option is set to **Enabled** by default. **NOTE:** When there are multiple add-in graphic cards installed in the system, the first card discovered during PCI enumeration is selected as the primary video. You might have to re-arrange the cards in the slots in order to control which card is the primary video.
Current State of Embedded Video Controller	Displays the current state of the embedded video controller. The **Current State of Embedded Video Controller** option is a read-only field. If the Embedded Video Controller is the only display capability in the system (that is, no add-in graphics card is installed), then the Embedded Video Controller is automatically used as the primary display even if the **Embedded Video Controller** setting is set to **Disabled**.
PCIe Preferred IO Device	When set to **Enabled**, you can provide the Bus/device/function address (in decimal) to choose end device for preferred IO device. This option is set to **Disabled** by default.
SR-IOV Global Enable	Enables or disables the BIOS configuration of Single Root I/O Virtualization (SR-IOV) devices. This option is set to **Disabled** by default.
Internal SD Card Port	Enables or disables the internal SD card port of the Internal Dual SD Module (IDSDM). This option is set to **On** by default.
Internal SD Card Redundancy	Configures the redundancy mode of the Internal Dual SD Module (IDSDM). When set to **Mirror** Mode, data is written on both SD cards. After failure of either card and replacement of the failed card, the data of the active card is copied to the offline card during the system boot. When Internal SD Card Redundancy is set to **Disabled**, only the primary SD card is visible to the OS. This option is set to **Mirror** by default.
Internal SD Primary Card	By default, the primary SD card is selected to be SD Card 1. If SD Card 1 is not present, then the controller selects SD Card 2 to be the primary SD card. This option is set to **SD Card 1** by default.
OS Watchdog Timer	If your system stops responding, this watchdog timer aids in the recovery of your operating system. When this option is set to **Enabled**, the operating system initializes the timer. When this option is set to **Disabled** (the default), the timer does not have any effect on the system.
Empty Slot Unhide	Enables or disables the root ports of all the empty slots that are accessible to the BIOS and OS. This option is set to **Disabled** by default.

Table 23. Integrated Devices details (continued)

Option	Description
Memory Mapped I/O above 4 GB	Enables or disables the support for the PCIe devices that need large amounts of memory. Enable this option only for 64-bit operating systems. This option is set to **Enabled** by default.
Memory Mapped I/O Base	When set to **12 TB**, the system maps the MMIO base to 12 TB. Enable this option for an OS that requires 44 bit PCIe addressing. When set to **512 GB**, the system maps the MMIO base to 512 GB, and reduces the maximum support for memory to less than 512 GB. Enable this option only for the 4 GPU DGMA issue. This option is set to **56 TB** by default.
Slot Disablement	Enables or disables the available PCIe slots on your system. The slot disablement feature controls the configuration of the PCIe cards installed in the specified slot. Slots must be disabled only when the installed peripheral card prevents booting into the operating system or causes delays in system startup. If the slot is disabled, both the Option ROM and UEFI drivers are disabled. Only slots that are present on the system will be available for control. **Slot n**: Enables or disables or only the boot driver is disabled for the PCIe slot n. This option is set to **Enabled** by default.
Slot Bifurcation	**Slot Discovery Bifurcation Settings** allows **Platform Default Bifurcation** and **Manual bifurcation Control**. The default is set to **Platform Default Bifurcation**. The slot bifurcation field is accessible when set to **Manual bifurcation Control** and is grayed out when set to **Platform Default Bifurcation**.

Serial Communication

To view the **Serial Communication** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **Serial Communication**.

Table 24. Serial Communication details

Option	Description
Serial Communication	Selects serial communication devices (Serial Device 1 and Serial Device 2) in BIOS. BIOS console redirection can also be enabled, and the port address can be specified. This option is set to **Auto** by default.
Serial Port Address	Enables you to set the port address for serial devices. . This field sets the serial port address to either COM1 or COM2 (COM1=0x3F8, COM2=0x2F8). **NOTE:** You can use only Serial Device 2 for the Serial Over LAN (SOL) feature. To use console redirection by SOL, configure the same port address for console redirection and the serial device. **NOTE:** Every time the system boots, the BIOS syncs the serial MUX setting that is saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS setup utility may not always revert the serial MUX setting to the default setting of Serial Device 1.
External Serial Connector	Enables you to associate the External Serial Connector to **Serial Device 1**, **Serial Device 2**, or the **Remote Access Device** by using this option. This option is set to **Serial Device 1** by default. **NOTE:** Only Serial Device 2 can be used for Serial Over LAN (SOL). To use console redirection by SOL, configure the same port address for console redirection and the serial device. **NOTE:** Every time the system boots, the BIOS syncs the serial MUX setting saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS

Table 24. Serial Communication details (continued)

Option	Description
	setup utility may not always revert this setting to the default setting of Serial Device 1.
Failsafe Baud Rate	Specifies the failsafe baud rate for console redirection. The BIOS attempts to determine the baud rate automatically. This failsafe baud rate is used only if the attempt fails, and the value must not be changed. This option is set to **115200** by default.
Remote Terminal Type	Sets the remote console terminal type. This option is set to **VT100/VT220** by default.
Redirection After Boot	Enables or disables the BIOS console redirection when the operating system is loaded. This option is set to **Enabled** by default.

System Profile Settings

To view the **System Profile Settings** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **System Profile Settings**.

Table 25. System Profile Settings details

Option	Description
System Profile	Sets the system profile. If you set the System Profile option to a mode other than **Custom**, the BIOS automatically sets the rest of the options. You can only change the rest of the options if the mode is set to **Custom**. This option is set to **Performance Per Watt (OS)** by default. Other options include **Performance** and **Custom**. **NOTE:** All the parameters on the system profile setting screen are available only when the **System Profile** option is set to **Custom**.
CPU Power Management	Sets the CPU power management. This option is set to **OS DBPM** by default. Other option includes **Maximum Performance**.
Memory Frequency	Sets the speed of the system memory. You can select **Maximum Performance** or a specific speed. This option is set to **Maximum Performance** by default.
Turbo Boost	Enables or disables the processor to operate in the turbo boost mode. This option is set to **Enabled** by default.
C1E	Enables or disables the processor to switch to a minimum performance state when it is idle. This option is set to **Enabled** by default.
C States	Enables or disables the processor to operate in all available power states. C States allow the processor to enter lower power states when idle. When set to **Enabled** (OS controlled) or when set to **Autonomous** (if hardware controlled is supported), the processor can operate in all available Power States to save power, but may increase memory latency and frequency jitter. This option is set to **Enabled** by default.
Write Data CRC	When set to **Enabled**, DDR4 data bus issues are detected and corrected during 'write' operations. Two extra cycles are required for CRC bit generation which impacts the performance. Read-only unless System Profile is set to **Custom**. This option is set to **Disabled** by default.
Memory Patrol Scrub	Sets the memory patrol scrub mode. This option is set to **Standard** by default.
Memory Refresh Rate	Sets the memory refresh rate to either 1x or 2x. This option is set to **1x** by default.
Uncore Frequency	Enables you to select the **Processor Uncore Frequency** option. **Dynamic mode** enables the processor to optimize power resources across cores and uncores during runtime. The optimization of the uncore frequency to either save power or optimize performance is influenced by the setting of the **Energy Efficiency Policy** option.

Table 25. System Profile Settings details (continued)

Option	Description
Energy Efficient Policy	Enables you to select the **Energy Efficient Policy** option. The CPU uses the setting to manipulate the internal behavior of the processor and determines whether to target higher performance or better power savings. This option is set to **Balanced Performance** by default.
Number of Turbo Boost Enabled Cores for Processor 1	**NOTE:** If there are two processors installed in the {Varref: term1_singular}system , you will see an entry for **Number of Turbo Boost Enabled Cores for Processor 2** Controls the number of turbo boost enabled cores for Processor 1. The maximum number of cores is enabled by default.
Monitor/Mwait	Enables the Monitor/Mwait instructions in the processor. This option is set to **Enabled** for all system profiles, except **Custom** by default. **NOTE:** This option can be disabled only if the **C States** option in the **Custom** mode is set to **disabled**. **NOTE:** When **C States** is set to **Enabled** in the **Custom** mode, changing the Monitor/Mwait setting does not impact the system power or performance.
CPU Interconnect Bus Link Power Management	Enables or disables the CPU Interconnect Bus Link Power Management. This option is set to **Enabled** by default.
PCI ASPM L1 Link Power Management	Enables or disables the PCI ASPM L1 Link Power Management. This option is set to **Enabled** by default.

System Security

To view the **System Security** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **System Security**.

Table 26. System Security details

Option	Description
CPU AES-NI	Improves the speed of applications by performing encryption and decryption by using the Advanced Encryption Standard Instruction Set (AES-NI). This option is set to **Enabled** by default.
System Password	Sets the system password. This option is set to **Enabled** by default and is read-only if the password jumper is not installed in the system.
Setup Password	Sets the setup password. This option is read-only if the password jumper is not installed in the system.
Password Status	Locks the system password. This option is set to **Unlocked** by default.

Table 27. TPM 1.2 security information

Option	Description
TPM Security	**NOTE:** The TPM menu is available only when the TPM module is installed. Enables you to control the reporting mode of the TPM. The **TPM Security** option is set to **Off** by default. You can only modify the TPM Status, and TPM Activation if the **TPM Status** field is set to either **On with Pre-boot Measurements** or **On without Pre-boot Measurements**. When TPM 1.2 is installed, the **TPM Security** option is set to **Off**, **On with Pre-boot Measurements**, or **On without Pre-boot Measurements**.
TPM Information	Changes the operational state of the TPM. This option is set to **No Change** by default.
TPM Firmware	Indicates the firmware version of the TPM.
TPM Status	Specifies the TPM status.

Table 27. TPM 1.2 security information (continued)

Option	Description
TPM Command	Controls the Trusted Platform Module (TPM). When set to **None**, no command is sent to the TPM. When set to **Activate**, the TPM is enabled and activated. When set to **Deactivate**, the TPM is disabled and deactivated. When set to **Clear**, all the contents of the TPM are cleared. This option is set to **None** by default.

Table 28. TPM 2.0 security information

Option	Description
TPM Information	Changes the operational state of the TPM. This option is set to **No Change** by default.
TPM Firmware	Indicates the firmware version of the TPM.
TPM Hierarcy	Enables, disables, or clears the storage and endorsement hierarchies. When set to **Enabled**, the storage and endorsement hierarchies can be used. When set to **Disabled**, the storage and endorsement hierarchies cannot be used. When set to **Clear**, the storage and endorsement hierarchies are cleared of any values, and then reset to **Enabled**.

Table 29. TPM information

Option	Description
TPM Information	Enables you to change the operational state of the TPM. This option is set to **No Change** by default.
TPM Status	Specifies the TPM status.
TPM Command	Controls the Trusted Platform Module (TPM). When set to **None**, no command is sent to the TPM. When set to **Activate**, the TPM is enabled and activated. When set to **Deactivate**, the TPM is disabled and deactivated. When set to **Clear**, all the contents of the TPM are cleared. This option is set to **None** by default.
TPM Advanced Settings	This setting is enabled only when TPM Security is set to ON.

Table 30. TPM Advanced Settings Details information

Option	Description
TPM PPI Bypass Provision	When set to **Enabled** allows the Operating System to bypass Physical Presence Interface (PPI).
TPM PPI Bypass Clear	When set to **Enabled** allows the Operating System to bypass Physical Presence Interface (PPI).
TPM2 Algorithm Selection	Enables you to select TPM2 Algorithm.

Table 31. System Security details

Option	Description
Intel(R) TXT	Enables you to set the Intel Trusted Execution Technology (TXT) option. To enable the **Intel TXT** option, virtualization technology and TPM Security must be enabled with Pre-boot measurements. This option is set to **Off** by default.
Power Button	Enables or disables the power button on the front of the system. This option is set to **Enabled** by default.
AC Power Recovery	Sets how the system behaves after AC power is restored to the system. This option is set to **Last** by default.
AC Power Recovery Delay	Sets the time delay for the system to power up after AC power is restored to the system. This option is set to **Immediate** by default.

Table 31. System Security details (continued)

Option	Description
User Defined Delay (60 s to 600 s)	Sets the **User Defined Delay** option when the **User Defined** option for **AC Power Recovery Delay** is selected.
UEFI Variable Access	Provides varying degrees of securing UEFI variables. When set to **Standard** (the default), UEFI variables are accessible in the operating system per the UEFI specification. When set to **Controlled**, selected UEFI variables are protected in the environment and new UEFI boot entries are forced to be at the end of the current boot order.
In-Band Manageability Interface	When set to **Disabled**, this setting hides the Management Engine's (ME), HECI devices, and the system's IPMI devices from the operating system. This prevents the operating system from changing the ME power capping settings, and blocks access to all in-band management tools. All management should be managed through out-of-band. This option is set to **Enabled** by default. **NOTE:** BIOS update requires HECI devices to be operational and DUP updates require IPMI interface to be operational. This setting needs to be set to **Enabled** to avoid updating errors.
Secure Boot	Enables Secure Boot, where the BIOS authenticates each pre-boot image by using the certificates in the Secure Boot Policy. Secure Boot is set to **Disabled** by default.
Secure Boot Policy	When Secure Boot policy is set to **Standard**, the BIOS uses the system manufacturer's key and certificates to authenticate pre-boot images. When Secure Boot policy is set to **Custom**, the BIOS uses the user-defined key and certificates. Secure Boot policy is set to **Standard** by default.
Secure Boot Mode	Configures how the BIOS uses the Secure Boot Policy Objects (PK, KEK, db, dbx). If the current mode is set to **Deployed Mode**, the available options are **User Mode** and **Deployed Mode**. If the current mode is set to **User Mode**, the available options are **User Mode**, **Audit Mode**, and **Deployed Mode**.
Secure Boot Policy Summary	Specifies the list of certificates and hashes that secure boot uses to authenticate images.
Secure Boot Custom Policy Settings	Configures the Secure Boot Custom Policy. To enable this option, set the Secure Boot Policy to **Custom** option.

Table 32. Secure Boot Mode

Options	Descriptions
User Mode	In **User Mode**, PK must be installed, and BIOS performs signature verification on programmatic attempts to update policy objects. The BIOS allows unauthenticated programmatic transitions between modes.
Deployed Mode	**Deployed Mode** is the most secure mode. In **Deployed Mode**, PK must be installed and the BIOS performs signature verification on programmatic attempts to update policy objects. **Deployed Mode** restricts the programmatic mode transitions.
Audit Mode	In **Audit mode**, PK is not present. The BIOS does not authenticate programmatic updates to the policy objects, and transitions between modes. The BIOS performs a signature verification on pre-boot images and logs the results in the image Execution Information Table, but executes the images whether they pass or fail verification. **Audit Mode** is useful for programmatic determination of a working set of policy objects.

Creating a system and setup password

Prerequisites

Ensure that the password jumper is enabled. The password jumper enables or disables the system password and setup password features. For more information, see the System board jumper settings section.

NOTE: If the password jumper setting is disabled, the existing system password and setup password are deleted and you need not provide the system password to boot the system.

Steps

1. To enter System Setup, press F2 immediately after turning on or rebooting your system.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security**.
3. On the **System Security** screen, verify that **Password Status** is set to **Unlocked**.
4. In the **System Password** field, type your system password, and press Enter or Tab.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.

   A message prompts you to reenter the system password.
5. Reenter the system password, and click **OK**.
6. In the **Setup Password** field, type your setup password and press Enter or Tab.
   A message prompts you to reenter the setup password.
7. Reenter the setup password, and click **OK**.
8. Press Esc to return to the System BIOS screen. Press Esc again.
   A message prompts you to save the changes.
   NOTE: Password protection does not take effect until the system reboots.

Using your system password to secure your system

About this task

If you have assigned a setup password, the system accepts your setup password as an alternate system password.

Steps

1. Turn on or reboot your system.
2. Type the system password and press Enter.

Next steps

When **Password Status** is set to **Locked**, type the system password and press Enter when prompted at reboot.

NOTE: If an incorrect system password is typed, the system displays a message and prompts you to reenter your password. You have three attempts to type the correct password. After the third unsuccessful attempt, the system displays an error message that the system has stopped functioning and must be turned off. Even after you turn off and restart the system, the error message is displayed until the correct password is entered.

Deleting or changing system and setup password

Prerequisites

NOTE: You cannot delete or change an existing system or setup password if the **Password Status** is set to **Locked**.

Steps

1. To enter System Setup, press F2 immediately after turning on or restarting your system.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security**.

3. On the **System Security** screen, ensure that **Password Status** is set to **Unlocked**.
4. In the **System Password** field, alter or delete the existing system password, and then press Enter or Tab.
5. In the **Setup Password** field, alter or delete the existing setup password, and then press Enter or Tab.

   If you change the system and setup password, a message prompts you to reenter the new password. If you delete the system and setup password, a message prompts you to confirm the deletion.
6. Press Esc to return to the **System BIOS** screen. Press Esc again, and a message prompts you to save the changes.
7. Select **Setup Password**, change, or delete the existing setup password and press Enter or Tab.

   NOTE: If you change the system password or setup password, a message prompts you to reenter the new password. If you delete the system password or setup password, a message prompts you to confirm the deletion.

Operating with setup password enabled

If **Setup Password** is set to **Enabled**, type the correct setup password before modifying the system setup options.

If you do not type the correct password in three attempts, the system displays the following message:

```
Invalid Password! Number of unsuccessful password attempts: <x> System Halted! Must
power down.
```

```
Password Invalid. Number of unsuccessful password attempts: <x> Maximum number of
password attempts exceeded.System halted.
```

Even after you turn off and restart the system, the error message is displayed until the correct password is typed. The following options are exceptions:

- If **System Password** is not set to **Enabled** and is not locked through the **Password Status** option, you can assign a system password. For more information, see the System Security Settings screen section.
- You cannot disable or change an existing system password.

NOTE: You can use the password status option with the setup password option to protect the system password from unauthorized changes.

Redundant OS Control

To view the **Redundant OS Control** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **Redundant OS Control**.

Table 33. Redundant OS Control details

Option	Description
Redundant OS Location	Enables you to select a backup disk from the following devices: • **None** • **IDSDM** • **SATA Ports in AHCI mode** • **BOSS PCIe Cards (Internal M.2 Drives)** • **Internal USB** **NOTE:** RAID configurations and NVMe cards are not included, as BIOS does not have the ability to distinguish between individual drives in those configurations.
Redundant OS State	**NOTE:** This option is disabled if **Redundant OS Location** is set to **None**. When set to **Visible**, the backup disk is visible to the boot list and OS. When set to **Hidden**, the backup disk is disabled and is not visible to the boot list and OS. This option is set to **Visible** by default. **NOTE:** BIOS disables the device in hardware, so it is not accessed by the OS.
Redundant OS Boot	**NOTE:** This option is disabled if **Redundant OS Location** is set to **None** or if **Redundant OS State** is set to **Hidden**.

Table 33. Redundant OS Control details (continued)

Option	Description
	When set to **Enabled**, BIOS boots to the device specified in **Redundant OS Location**. When set to **Disabled**, BIOS preserves the current boot list settings. This option is set to **Enabled** by default.

Miscellaneous Settings

To view the **Miscellaneous Settings** screen, power on the system, press F2, and click **System Setup Main Menu** > **System BIOS** > **Miscellaneous Settings**.

Table 34. Miscellaneous Settings details

Option	Description
System Time	Enables you to set the time on the system.
System Date	Enables you to set the date on the system.
Asset Tag	Specifies the asset tag and enables you to modify it for security and tracking purposes.
Keyboard NumLock	Enables you to set whether the system boots with the NumLock enabled or disabled. This option is set to **On** by default. **NOTE:** This option does not apply to 84-key keyboards.
F1/F2 Prompt on Error	Enables or disables the F1/F2 prompt on error. This option is set to **Enabled** by default. The F1/F2 prompt also includes keyboard errors.
Load Legacy Video Option ROM	Enables or disables the Load Legacy Video Option ROM option. This option is set to **Disabled** by default.
Dell Wyse P25/P45 BIOS Access	Enables or disables the Dell Wyse P25/P45 BIOS Access. This option is set to **Enabled** by default.
Power Cycle Request	Enables or disables the Power Cycle Request. This option is set to **None** by default.

iDRAC Settings utility

The iDRAC settings utility is an interface to set up and configure the iDRAC parameters by using UEFI. You can enable or disable various iDRAC parameters by using the iDRAC settings utility.

NOTE: Accessing some of the features on the iDRAC settings utility needs the iDRAC Enterprise License upgrade.

For more information about using iDRAC, see *Dell Integrated Dell Remote Access Controller User's Guide* at www.dell.com/idracmanuals.

Device Settings

Device Settings enables you to configure the below device parameters:

- Controller Configuration Utility
- Embedded NIC Port1-X Configuration
- NICs in slotX, Port1-X Configuration
- BOSS Card configuration

Dell Lifecycle Controller

Dell Lifecycle Controller (LC) provides advanced embedded systems management capabilities including system deployment, configuration, update, maintenance, and diagnosis. LC is delivered as part of the iDRAC out-of-band solution and Dell system embedded Unified Extensible Firmware Interface (UEFI) applications.

Embedded system management

The Dell Lifecycle Controller provides advanced embedded system management throughout the lifecycle of the system. The Dell Lifecycle Controller is started during the boot sequence and functions independently of the operating system.

NOTE: Certain platform configurations may not support the full set of features provided by the Dell Lifecycle Controller.

For more information about setting up the Dell Lifecycle Controller, configuring hardware and firmware, and deploying the operating system, see the Dell Lifecycle Controller documentation at www.dell.com/idracmanuals.

Boot Manager

The **Boot Manager** option enables you to select boot options and diagnostic utilities.

To enter **Boot Manager**, power on the system and press F11.

Table 35. Boot Manager details

Option	Description
Continue Normal Boot	The system attempts to boot to devices starting with the first item in the boot order. If the boot attempt fails, the system continues with the next item in the boot order until the boot is successful or no more boot options are found.
One-shot Boot Menu	Enables you to access boot menu, where you can select a one-time boot device to boot from.
Launch System Setup	Enables you to access System Setup.
Launch Lifecycle Controller	Exits the Boot Manager and invokes the Dell Lifecycle Controller program.
System Utilities	Enables you to launch System Utilities menu such as Launch Diagnostics, BIOS update File Explorer, Reboot System.

PXE boot

You can use the Preboot Execution Environment (PXE) option to boot and configure the networked systems remotely.

To access the **PXE boot** option, boot the system and then press F12 during POST instead of using standard Boot Sequence from BIOS Setup. It does not pull any menu or allows managing of network devices.

5

Installing and removing system components

Topics:

Safety instructions

NOTE: To avoid injury, do not lift the system on your own, get others to assist you.

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

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

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

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.

NOTE: While replacing the hot swappable PSU, after next server boot; the new PSU automatically updates to the same firmware and configuration of the replaced one. For more information about the Part replacement configuration, see the *Lifecycle Controller User's Guide* at www.dell.com/idracmanuals

NOTE: While replacing faulty storage controller/FC/NIC card with the same type of card, after you power on the system; the new card automatically updates to the same firmware and configuration of the faulty one. For more information about the Part replacement configuration, see the *Lifecycle Controller User's Guide* at www.dell.com/idracmanuals

Before working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instruction.

Steps

1. Power off the system and all attached peripherals.
2. Disconnect the system from the electrical outlet, and disconnect the peripherals.
3. If applicable, remove the system from the rack.
   For more information, see the *Rail Installation Guide* relevant to your rail solutions at www.dell.com/dssmanuals.
4. If installed, remove the front bezel cover.
5. Remove the system cover.

After working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instruction.

Steps

1. Replace the system cover.
2. If applicable, install the system into the rack.
   For more information, see the *Rail Installation Guide* relevant to your rail solutions at www.dell.com/dssmanuals.
3. Reconnect the peripherals, and connect the system to the electrical outlet, and then power on the system.

   NOTE: If front bezel is installed, then en route the external cables through the openings on the sides of bezel tray.
4. If removed, install the front bezel cover.

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 #T20 screwdriver
- 5mm hex nut screwdriver
- Plastic scribe
- 1/4 inch flat blade screwdriver

- Wrist grounding strap connected to the ground
- ESD mat

Optional front bezel

Removing the front bezel cover

This topic shows the removal of front bezel cover.

Prerequisites

1. Follow the safety guidelines listed in the Safety instruction.

Steps

Press the release buttons on both the sides, and disengage the bezel cover from the bezel tray.

Figure 27. Front bezel cover removal

Next steps

Replace the bezel cover.

Installing the front bezel cover

This topic shows the installation of front bezel cover.

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.

Steps

1. Align and insert the tabs of the bezel cover into the slots on the bezel tray.

2. Press the bezel until the release buttons clicks in place.

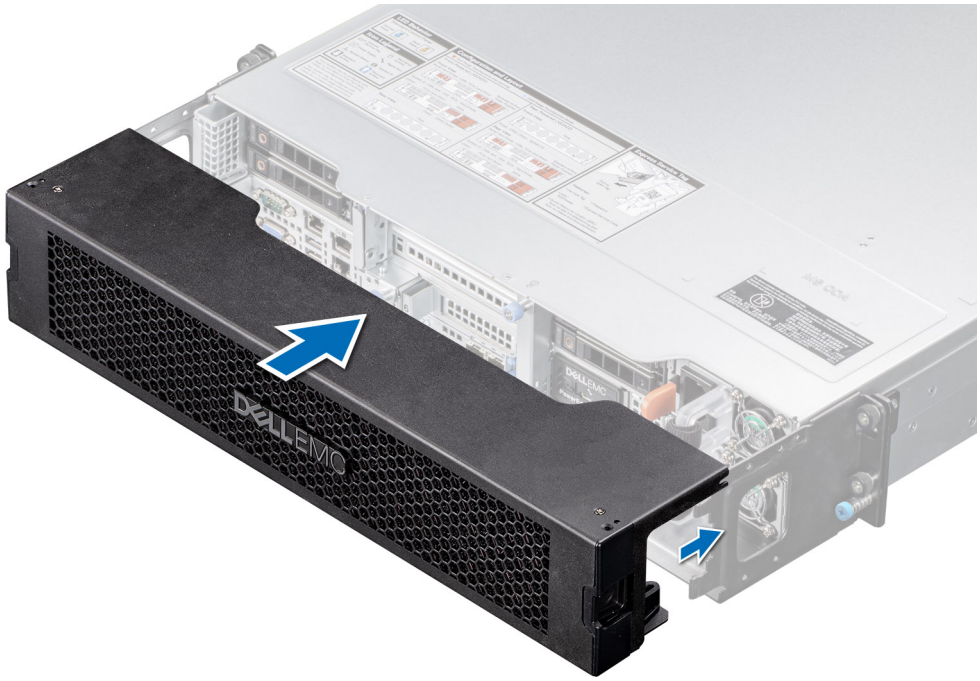


Figure 28. Front bezel cover installation

Removing the bezel filter from bezel cover

This topic shows the removal of front bezel cover.

Prerequisites

1. Follow the safety guidelines listed in the Safety instruction.
2. Remove the bezel cover.

Steps

Hold the pull tag on either right or left side, and pull the bezel filter out of the bezel.

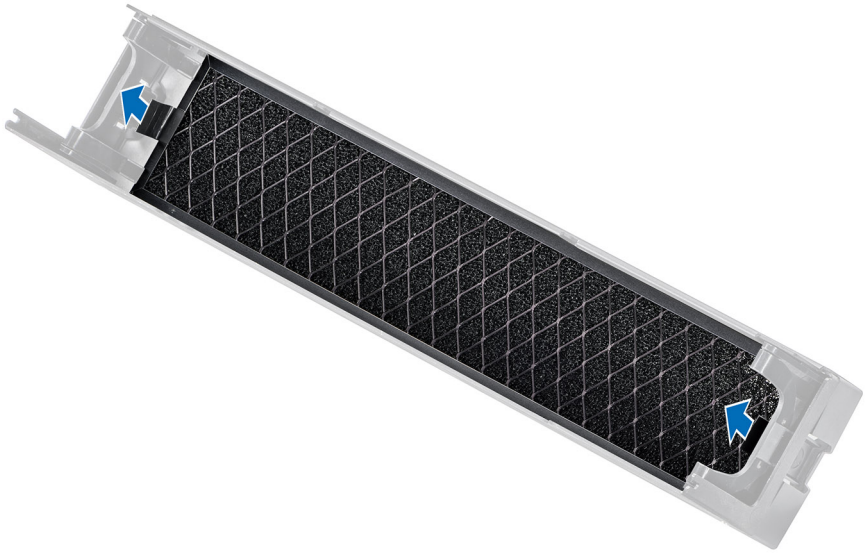


Figure 29. Bezel filter removal

Next steps

Replace the bezel filter.

Installing the filter inside the front bezel cover

This topic shows the removal of filter front bezel cover.

Prerequisites

1. Follow the safety guidelines listed in the Safety instruction.
2. Remove the front bezel cover.

Steps

1. Keeping the filter parallel to the bezel, insert the filter inside the bezel cover.
2. Push the filter inside the bezel until it is locked on both the sides.

NOTE: Filter is a consumable part. Based on a disciplined maintenance calendar in a controlled indoor environments like data centers or switching offices, it is recommended to change filters three to four times a year. You can contact sales team for filter kits that are available for replacing filters.

Figure 30. Bezel filter installation

Next steps

Install the front bezel cover.

Removing the bezel tray

This topic shows the removal of front bezel cover.

Prerequisites

1. Follow the safety guidelines listed in the Safety instruction.
2. If locked, unlock the bezel tray from the server chassis.
3. Unplug the front accessible cables and remove them out of the openings.

Steps

1. Loosen the four thumbscrews on the right and the left side of the bezel tray.
2. Pull the bezel tray out of the chassis.

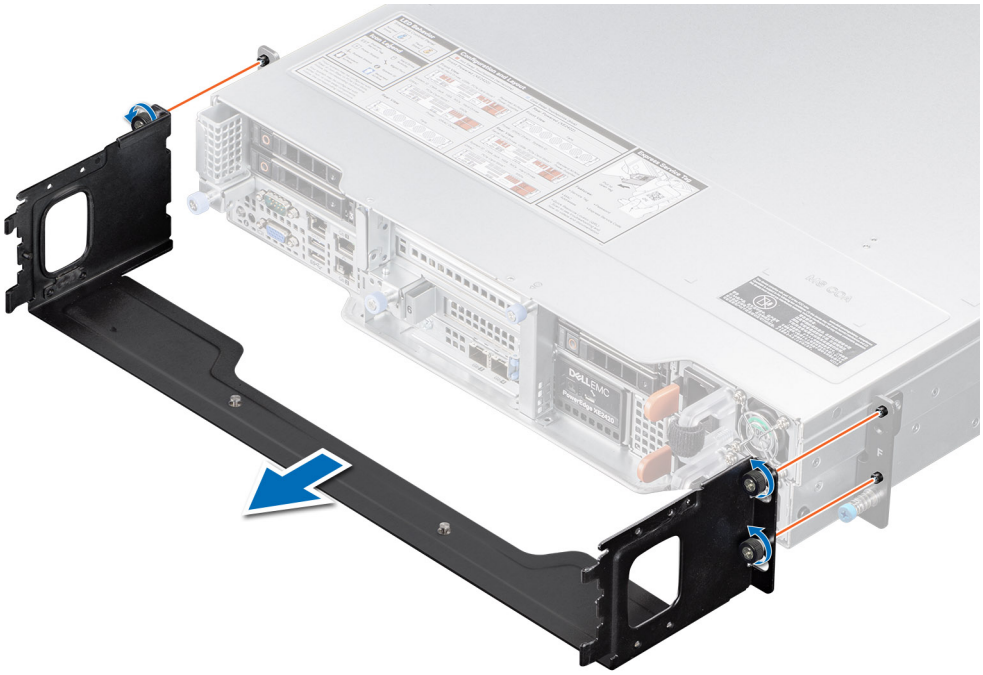


Figure 31. Front bezel tray removal

Next steps

Replace the bezel tray.

Installing the front bezel tray

This topic shows the removal of front bezel tray.

Prerequisites

1. Follow the safety guidelines listed in the Safety instruction.
2. If locked, unlock the bezel tray from the server chassis.
3. Remove the front accessible cables and pull them out of the brush filter.

Steps

1. Align the bezel tray with the server chassis, and push the bezel tray towards the chassis.
2. Tighten the four thumbscrews on the right and left side to secure the bezel tray with chassis.

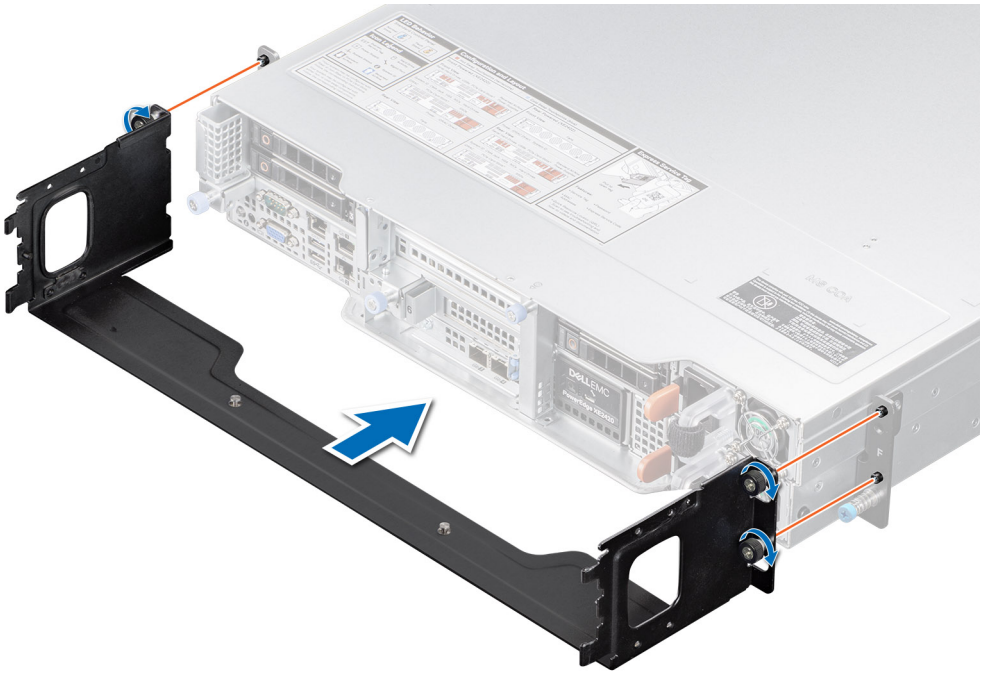


Figure 32. Front bezel tray installation

Next steps

1. If unlocked, lock the bezel tray with chassis.
2. Route the front connecting cables through the brush filters, and connect the cables to their respective ports.

System cover

Removing the system cover

Prerequisites

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

Steps

1. Loosen the thumbscrew on the front of chassis securing the system cover.
2. Slide the system cover towards the front, and lift the system cover.

Figure 33. System cover removal

Next steps

Replace the system cover.

Installing the system cover

Prerequisites

1. Follow the safety guidelines listed in the Safety instruction.

Steps

1. Align the pins on the system cover with the guide slots on the chassis.
2. Push the cover towards the rear to make it seat on the chassis.
3. Tighten the thumbscrew on the front of the chassis.

Figure 34. System cover installation

Next steps

If removed, install the bezel cover.

Drives

Removing a drive blank

Prerequisites

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

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

Steps

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

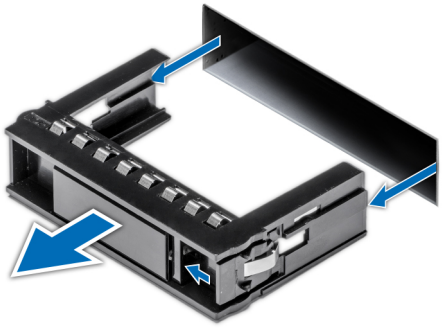


Figure 35. Removing a drive blank

Next steps

Installing a drive or replace the drive blank.

Installing a drive blank

Prerequisites

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

Steps

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

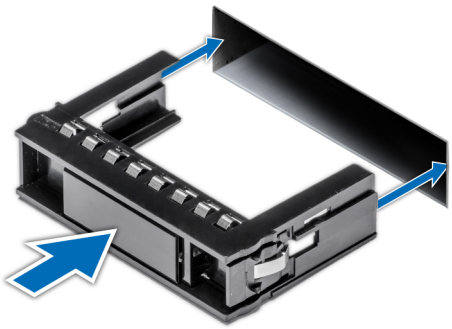


Figure 36. Installing a drive blank

Next steps

If removed, install the front bezel cover.

Removing the drive carrier

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. If installed, remove the front bezel cover.
3. Using the management software, prepare the drive for removal.

   If the drive is online, the green activity or fault indicator blinks while the drive is powering 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: 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 drive carrier release handle, slide the drive carrier out of the drive slot.

Figure 37. Removing a drive carrier

Next steps

Install a drive carrier or drive blank.

Installing the drive carrier

Prerequisites

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

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

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

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

NOTE: Ensure that the drive carrier's release handle is in the open position before inserting the carrier into the slot.

1. Follow the safety guidelines listed in the Safety instructions.
2. If installed, remove the front bezel.
3. Remove the drive carrier or remove the drive blank when you want to assemble the drives into the system.

Steps

1. Slide the drive carrier into the drive slot.
2. Close the drive carrier release handle to lock the drive in place.

Figure 38. Installing a drive carrier

Next steps

If removed, install the front bezel.

Removing the drive from the drive carrier

Prerequisites

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

Steps

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

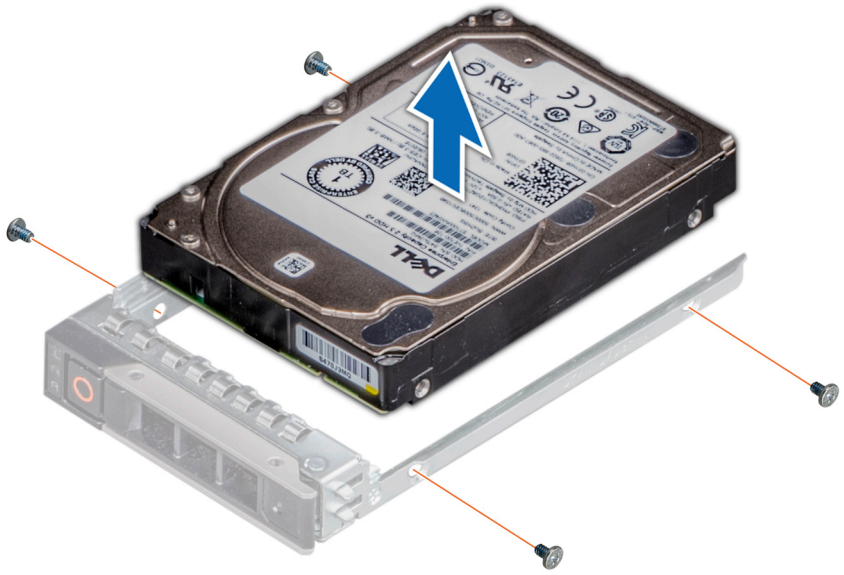


Figure 39. Removing the drive from the drive carrier

Next steps

Install the drive into the drive carrier.

Installing the drive into the drive carrier

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. If installed, remove the front bezel cover.
3. Remove the drive blank.

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

Steps

1. Insert the drive into the drive carrier with the drive connector facing towards the rear 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, secure the drive to the drive carrier with the screws.

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

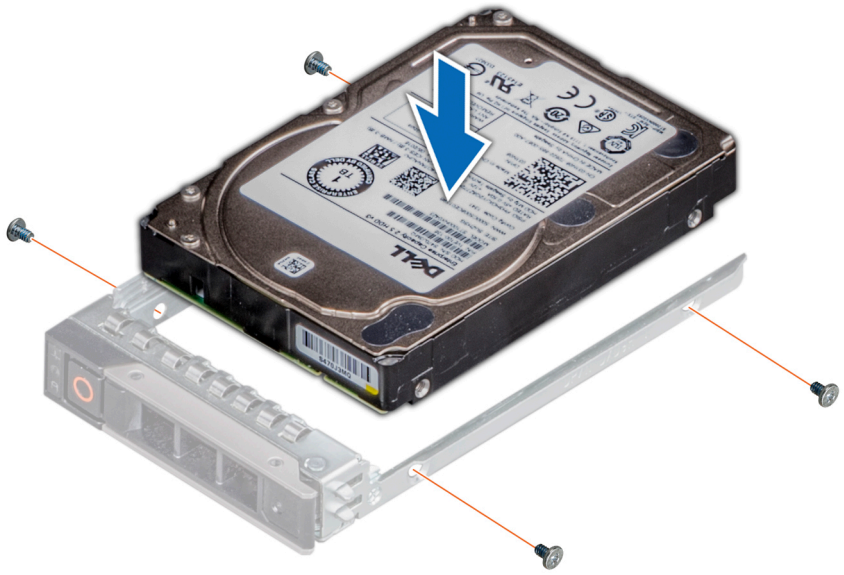


Figure 40. Installing a drive into the drive carrier

Next steps

1. Install the drive carrier.
2. If removed, install the front bezel cover.

Removing the EDSFF drive

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. If installed, remove the front bezel cover.
3. Using the management software, prepare the drive for removal.

   If the drive is online, the green activity or fault indicator blinks while the drive is powering 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: 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 release handle.
2. Holding the drive release handle, slide the drive out of the drive slot.

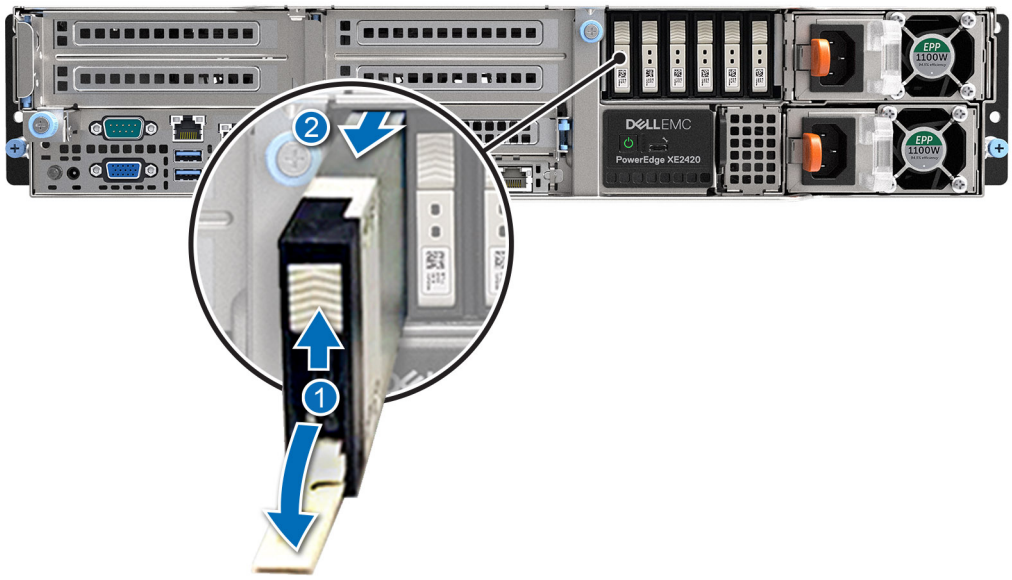


Figure 41. Removing the EDSFF drive

Next steps

Install a EDSFF drive.

Installing the EDSFF drive

Prerequisites

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

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

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

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

NOTE: Ensure that the drive carrier's release handle is in the open position before inserting the carrier into the slot.

1. Follow the safety guidelines listed in the Safety instructions.
2. If installed, remove the front bezel.
3. Remove the drive carrier or remove the drive blank when you want to assemble the drives into the system.

Steps

1. Slide the drive into the drive slot.
2. Close the drive release handle to lock the drive in place.

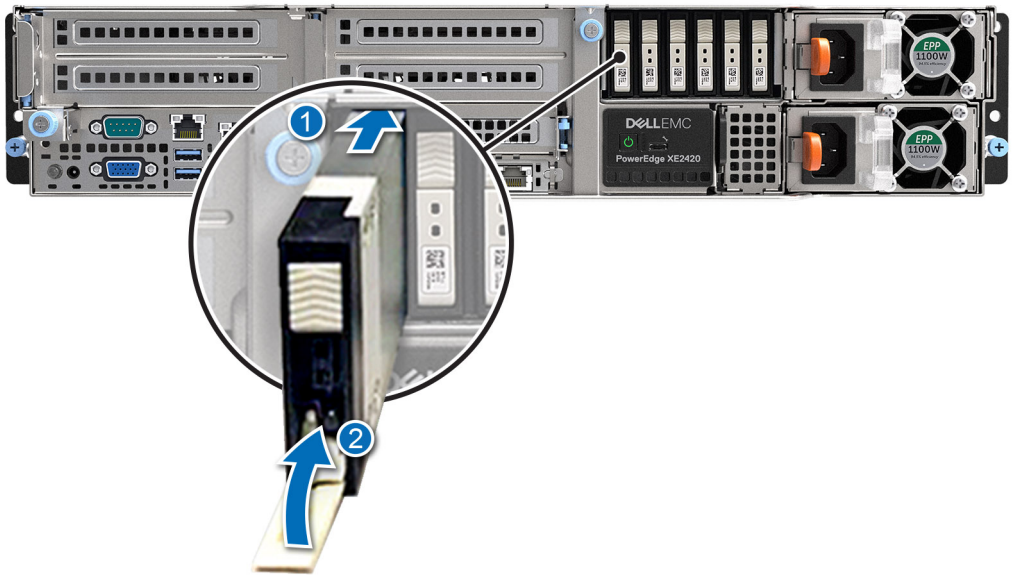


Figure 42. Installing the EDSFF drive

Next steps

If removed, install the front bezel.

Power supply unit

NOTE: While replacing the hot swappable PSU, after next server boot; the new PSU automatically updates to the same firmware and configuration of the replaced one. For more information about the Part replacement configuration, see the *Lifecycle Controller User's Guide* at www.dell.com/idracmanuals

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 system 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 of PSU rated power wattage, then the redundant PSU is switched to the active state.
- If the load on the active PSU falls below 20 percent of PSU rated power wattage, 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, see the *iDRAC User's Guide* available at www.dell.com/idracmanuals.

Removing a power supply unit blank

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.

2. If installed, remove the front bezel cover .

Steps

Pull the blank out of the system.

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

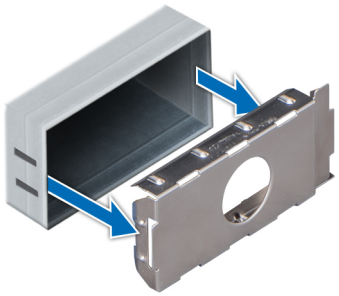


Figure 43. Removing a power supply unit blank

Next steps

Replace the PSU or PSU blank.

Installing a power supply unit blank

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
   NOTE: Install the power supply unit (PSU) blank only in the second PSU bay.
2. If installed, remove the front bezel cover.
3. Remove the PSU.

Steps

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

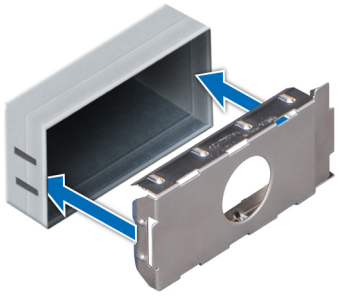


Figure 44. Installing a power supply unit blank

Next steps

Install the front bezel cover.

Removing a power supply unit

Prerequisites

CAUTION: The system requires 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 the Safety instructions.
2. If installed, remove the front bezel cover.
3. Disconnect the power cable from the power outlet and from the PSU you intend to remove.
4. Remove the cable from the strap on the PSU handle.

Steps

Press the release latch, and holding the PSU handle slide the PSU out of the PSU bay.

NOTE: The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.

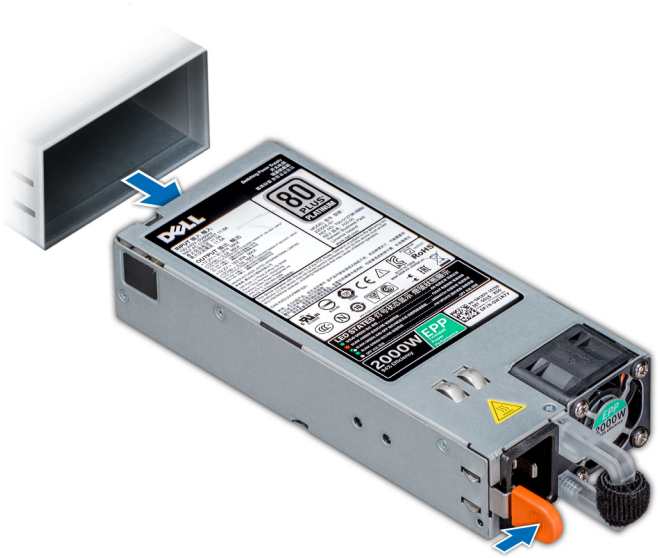


Figure 45. Removing a power supply unit

Next steps

Replace the PSU or install the PSU blank.

Installing a power supply unit

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. If installed, remove the front bezel cover.
3. For systems that support redundant PSU, ensure that both the PSUs are of the same type and have the same maximum output power.

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

Steps

Slide the PSU into the PSU bay until the release latch snaps into place.

NOTE: The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.

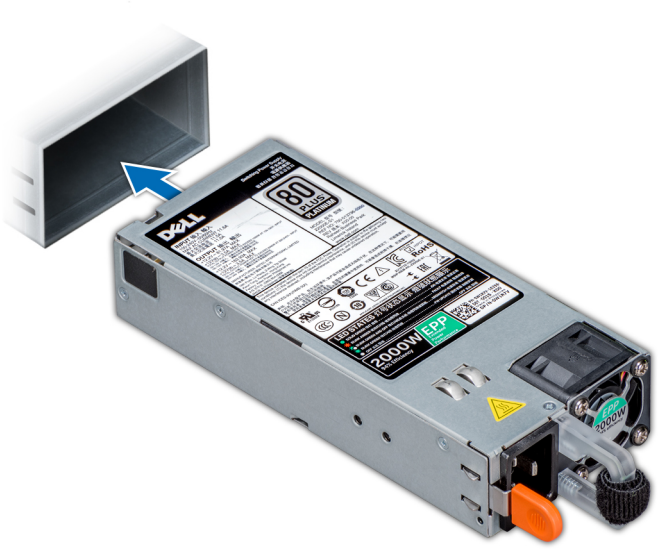


Figure 46. Installing a power supply unit

Next steps

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

   NOTE: If front bezel is installed, then en route the external cables through the gaps on the sides of bezel tray.

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

   NOTE: When installing, hot swapping, or hot adding a new PSU, wait for 15 seconds for the system to recognize the PSU and determine its status. The PSU redundancy may not occur until discovery is complete. The PSU status indicator turns green to indicate that the PSU is functioning properly.
2. If removed, install the front bezel cover.

NOTE: While replacing the hot swappable PSU, after next server boot; the new PSU automatically updates to the same firmware and configuration of the replaced one. For more information about the Part replacement configuration, see the *Lifecycle Controller User's Guide* at www.dell.com/idracmanuals

Wiring instructions for a DC power supply unit

Your system supports up to two –(48–60) V DC power supply units (PSUs).

NOTE: For equipment using –(48–60) V DC power supply units (PSUs), a qualified electrician must perform all connections to DC power and to safety grounds. Do not attempt connecting to DC power or installing grounds yourself. All electrical wiring must comply with applicable local or national codes and practices. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow all safety instructions that came with the product.

CAUTION: Wire the unit with copper only, unless otherwise specified, use only 10 American Wire Gauge (AWG) wire rated minimum 90ºC for source and return. Protect the –(48–60) V DC (1 wire) with a branch circuit over-current protection rated 50 A for DC with a high interrupt current rating.

CAUTION: Connect the equipment to a –(48–60) V DC supply source that is electrically isolated from the AC source (reliably grounded –(48–60) V DC SELV source). Ensure that the –(48–60) V DC source is efficiently secured to earth (ground).

NOTE: A readily accessible disconnect device that is suitably approved and rated shall be incorporated in the field wiring.

Input requirements

- Supply voltage: –(48–60) V DC
- Current consumption: 32 A (maximum)

Kit contents

- Dell part number 6RYJ9 terminal block or equivalent (1)
- #6-32 nut equipped with lock washer (1)

Required tools

Wire-stripper pliers capable of removing insulation from size 10 AWG solid or stranded, insulated copper wire.

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

Required wires

- One UL 10 AWG, 2 m maximum (stranded) black wire [–(48–60) V DC].
- One UL 10 AWG, 2 m maximum (stranded) red wire (V DC return).
- One UL 10 AWG, 2 m maximum, green with a yellow stripe, stranded wire (safety ground).

Assembling and connecting safety ground wire

Prerequisites

NOTE: For equipment using –(48–60) V DC power supply units (PSUs), a qualified electrician must perform all connections to DC power and to safety grounds. Do not attempt connecting to DC power or installing grounds yourself. All electrical wiring must comply with applicable local or national codes and practices. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow all safety instructions that came with the product.

Steps

1. Strip the insulation from the end of the green or yellow wire, exposing approximately 4.5 mm (0.175 inch) of copper wire.
2. Using a hand-crimping tool (Tyco Electronics, 58433-3 or equivalent), crimp the ring-tongue terminal (Jeeson Terminals Inc., R5-4SA or equivalent) to the green and yellow wire (safety ground wire).
3. Connect the safety ground wire to the grounding post on the back of the system by using a #6-32 nut equipped with a locking washer.

Assembling DC input power wires

Prerequisites

NOTE: For equipment using –(48–60) V DC power supply units (PSUs), a qualified electrician must perform all connections to DC power and to safety grounds. Do not attempt connecting to DC power or installing grounds yourself. All electrical wiring must comply with applicable local or national codes and practices. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow all safety instructions that came with the product.

Steps

1. Strip the insulation from the ends of the DC power wires, exposing approximately 13 mm (0.5 inch) of copper wire.

   NOTE: Reversing polarity when connecting DC power wires can permanently damage the power supply or the system.

2. Insert the copper ends into the mating connectors and tighten the captive screws at the top of the mating connector using a Phillips #2 screwdriver.

NOTE: To protect the power supply from electrostatic discharge, the captive screws must be covered with the rubber cap before inserting the mating connector into the power supply.

3. Rotate the rubber cap clockwise to fix it over the captive screws.
4. Insert the mating connector into the power supply.

Cooling fan

Removing a cooling fan

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.

Steps

Holding the orange and black edges on the fan module, lift the cooling fan module vertically to disconnect from the connector on the fan backplane.

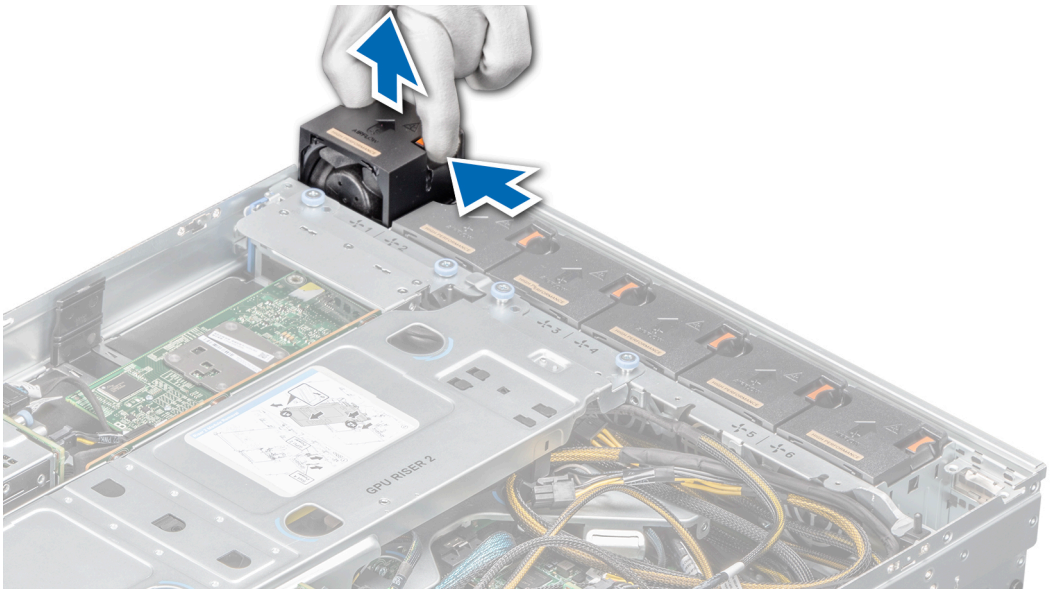


Figure 47. Cooling fan removal

Next steps

Replace a fan.

Installing a cooling fan

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.

Steps

1. Align and place the fan module connector horizontally with the connector on the system board.
2. Press the touch point on the cooling fan module until firmly connected.

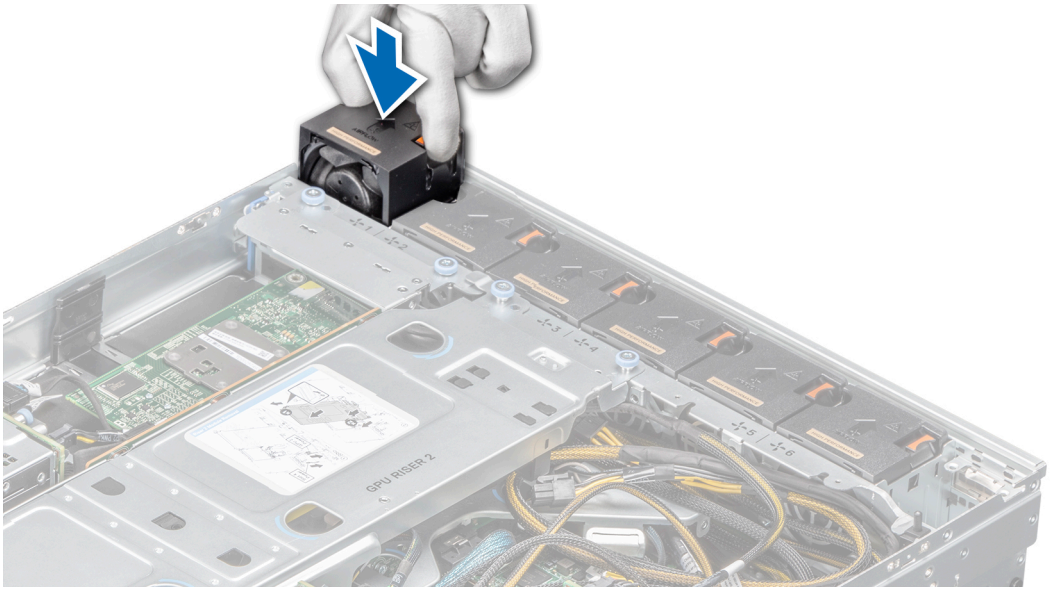


Figure 48. Cooling fan installation

Next steps

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

Cooling fan backplane

Removing a cooling fan backplane

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove all the cooling fans.

Steps

1. Loosen the thumbscrews from the rear of the chassis.
2. Pull the backplane tray out of the chassis.

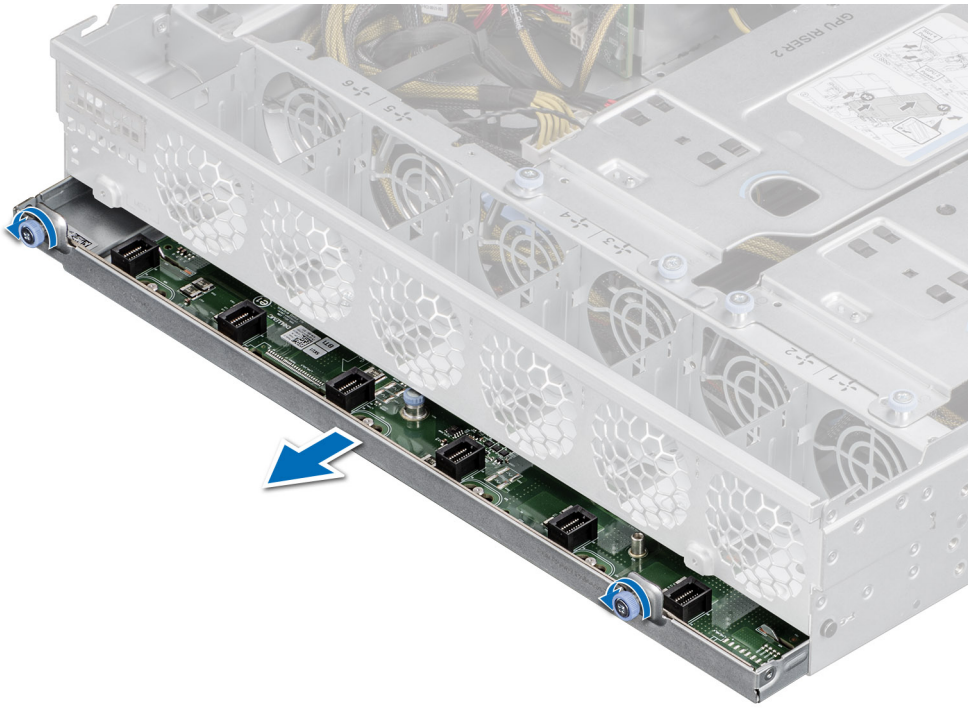


Figure 49. Fan backplane tray removal

3. Hold the plunger, and slide the backplane towards rights side.
4. Lift the backplane out of the backplane tray.

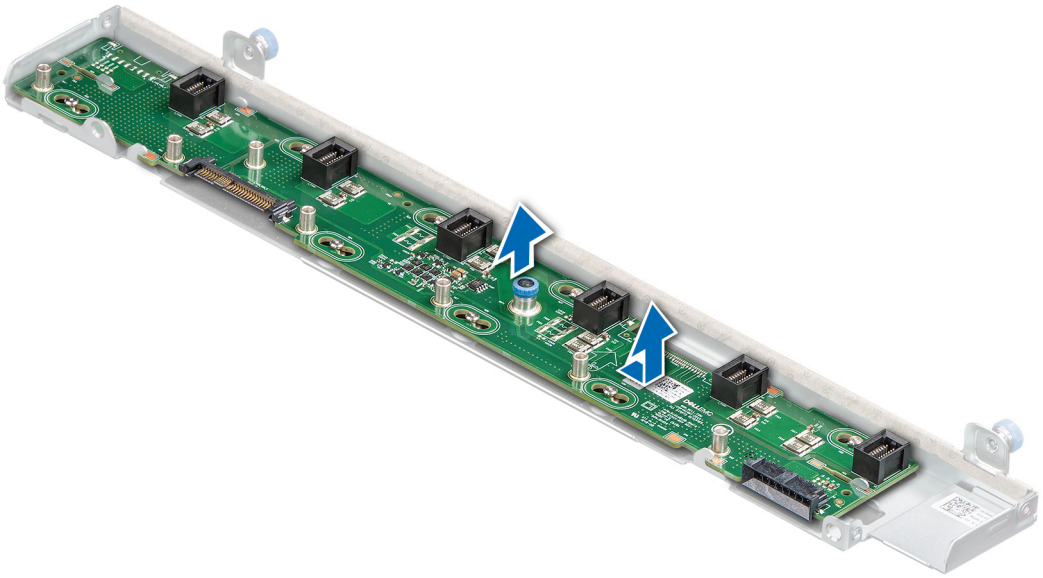


Figure 50. Fan backplane board removal

Next steps

Replace a cooling fan backplane.

Installing a cooling fan backplane

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove all the cooling fans.

Steps

1. Align the cooling fan backplane with the pins on the backplane tray.
2. Slide the backplane towards the left to lock the backplane on the tray.

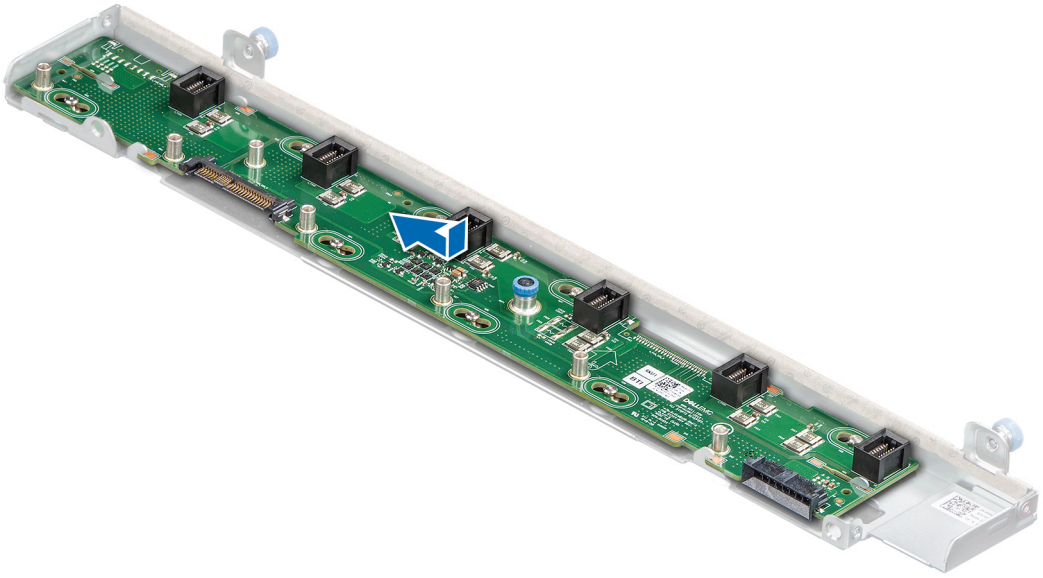


Figure 51. Fan backplane board installation

3. Insert the tray firmly into the slot until the backplane connectors is fully connected to the cables.
4. Tighten the thumbscrews.

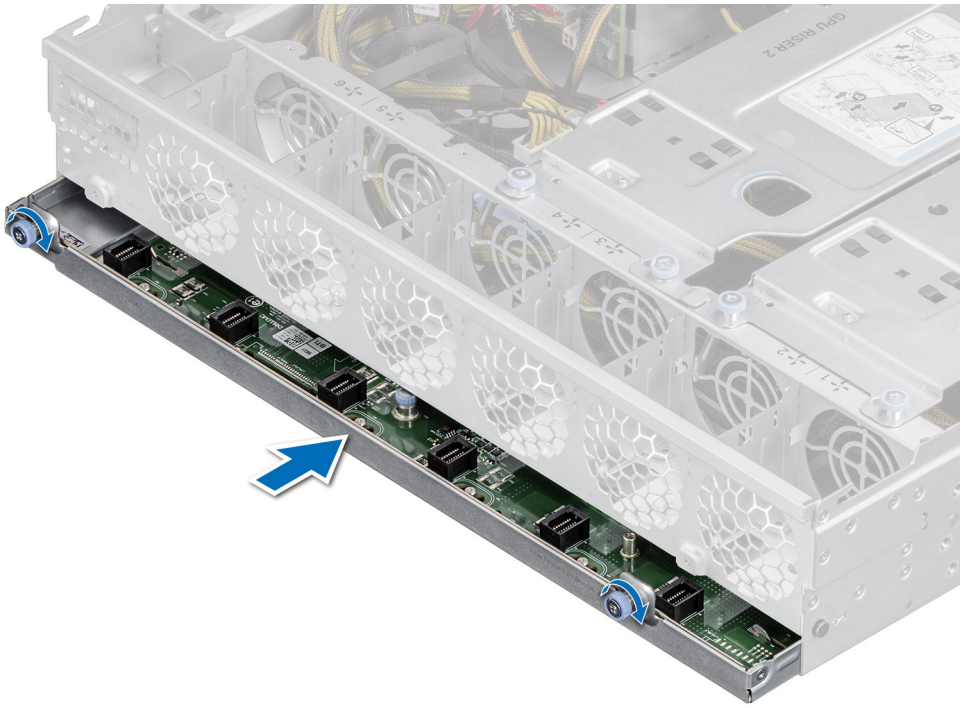


Figure 52. Fan backplane tray installation

Next steps

1. Install all the cooling fans.
2. Follow the procedure listed in After working inside your system.

Removing the cooling fan cables

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove all the cooling fans.
4. Remove the cooling fan backplane.
5. Remove the GPU riser 2
6. Remove the GPU riser 1 or second drive bay assembly.
7. Remove the NVME riser.
8. Remove the air shroud.

Steps

1. Loosen the thumbscrews securing the cables to the chassis.
2. Slide the cables towards the left, and lift the cable out of the chassis.

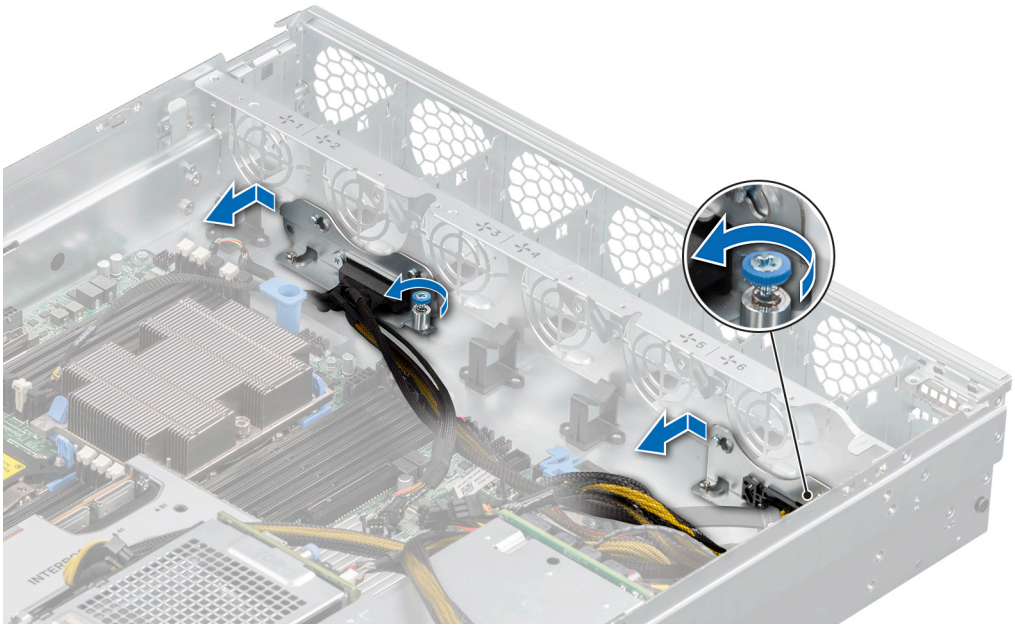


Figure 53. Cooling fan cables removal

Next steps

Replace the cooling fan cables.

Installing the cooling fan cables

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove all the cooling fans.
4. Remove the cooling fan backplane.
5. Remove the GPU riser 2
6. Remove the GPU riser 1 or second drive bay assembly.
7. Remove the NVME riser.
8. Remove the air shroud.

Steps

1. Align the cable points with the points on the chassis and move the cables towards the right.
2. Tighten the thumbscrews to secure the cables with the chassis.

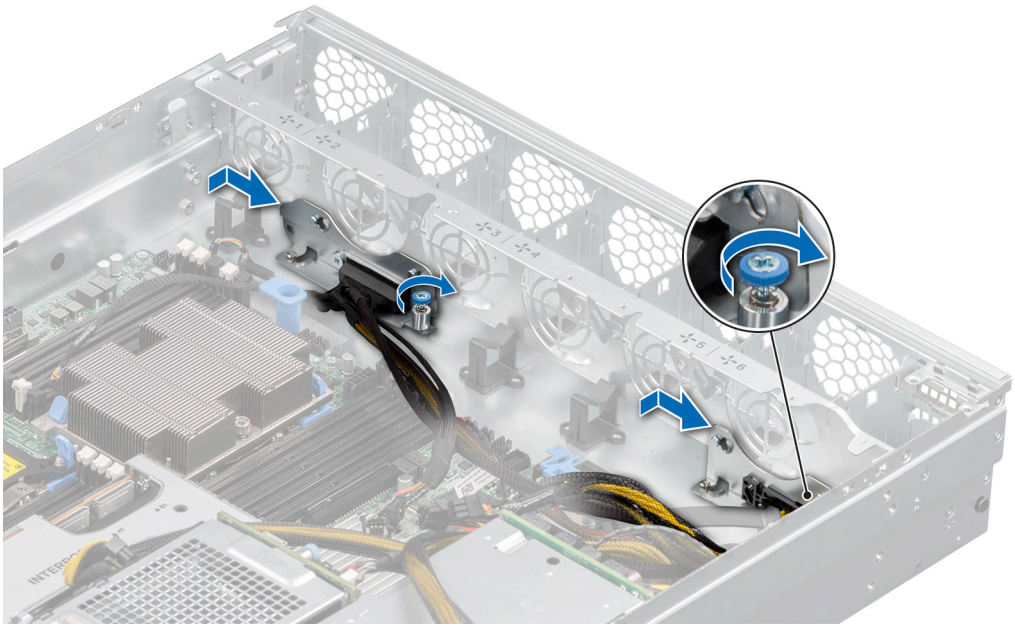


Figure 54. Cooling fan cables installation

Next steps

1. Install the air shroud.
2. Install the NVME riser.
3. Install the GPU riser 1 or second drive bay assembly.
4. Install the GPU riser 2.
5. Install the cooling fan backplane.
6. Install all the cooling fans.
7. Follow the procedure listed in After working inside your system.

Drive backplane

Drive backplane

Depending on your system configuration, the drive backplanes that are supported are listed here:

Table 36. Supported backplane options

System	Configuration	Supported hard drives options
PowerEdge XE2420	1A (Primary backplane module)	2 x 2.5-inch SATA/NVMe
	2C (Primary backplane module + Secondary backplane 2 module)	2 x 2.5-inch SAS/SATA/NVMe + 2 x 2.5-inch SAS/SATA/NVMe
	3A (EDSFF Switch backplane)	6 x EDSFF E1.L drives

NOTE: In 2C configuration, hard drive slots 2 and 3 do not support NVMe drives if only processor 1 is installed.

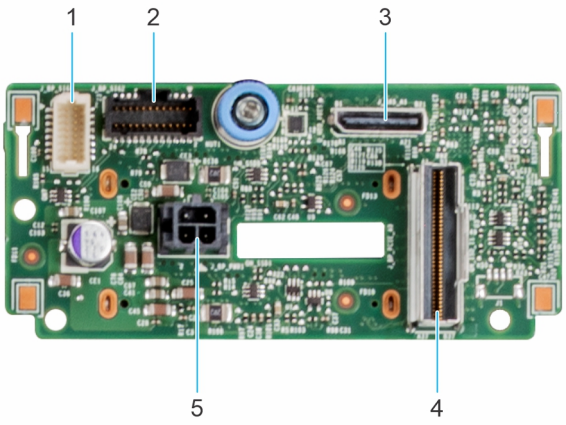


Figure 55. 2 x 2.5-inch- primary drive backplane

1. J_BP_S1G1 (Backplane to system board)
2. J_BP_S1G2 (Backplane to secondary drive bay backplane)
3. J_SAS_A1
   a. Config1A: Backplane to system board
   b. Config2C: Backplane to raid controller
4. J_BP_PCIE_A0 (Backplane to NVME riser)
5. J_BP_PWR1 (Backplane to system board and PIB)

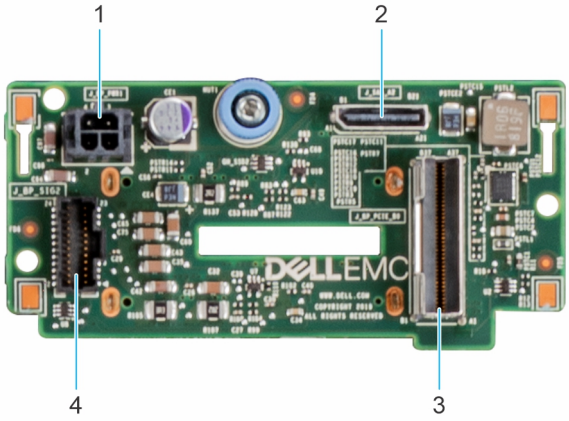


Figure 56. 2 x 2.5-inch secondary drive backplane

1. J_BP_PWR1 (Backplane to power interposer board)
2. J_SAS_A2 (Backplane to raid controller)
3. J_BP_PCIE_B0 (Backplane to system board)
4. J_BP_SIG2 (Backplane to primary drive bay backplane)

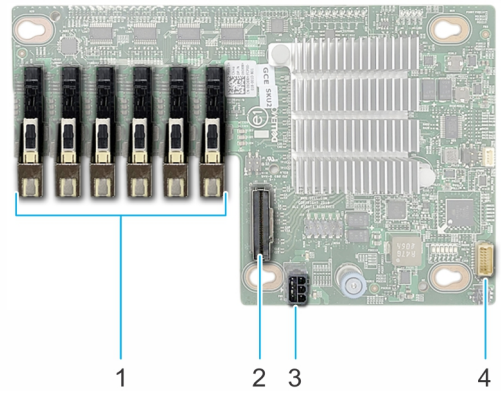


Figure 57. 6 x EDSFF switch backplane

1. EDSFF Connectors
2. J_SLIMLINE_1 (Backplane to NVMe riser)
3. PWR (Backplane to PIB)
4. J_BP_SIG1 (Backplane to system board)

Removing the 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 reinstall them in the same location.

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

1. Follow the safety guidelines listed in the Safety instruction.
2. Follow the procedure listed in the Before working inside your system.
3. Remove all the drives.

   NOTE: To avoid damaging the backplane, ensure to move the control panel cables from the cable routing clips before removing the backplane.
4. Disconnect all the cables that are connected to the backplane.

   NOTE: Observe the routing of the cable as you remove it from the system.

Steps

1. Pull the plunger to disengage the drive backplane from the lock hole on the drive cage.
2. Lift the drive backplane out of the drive cage.

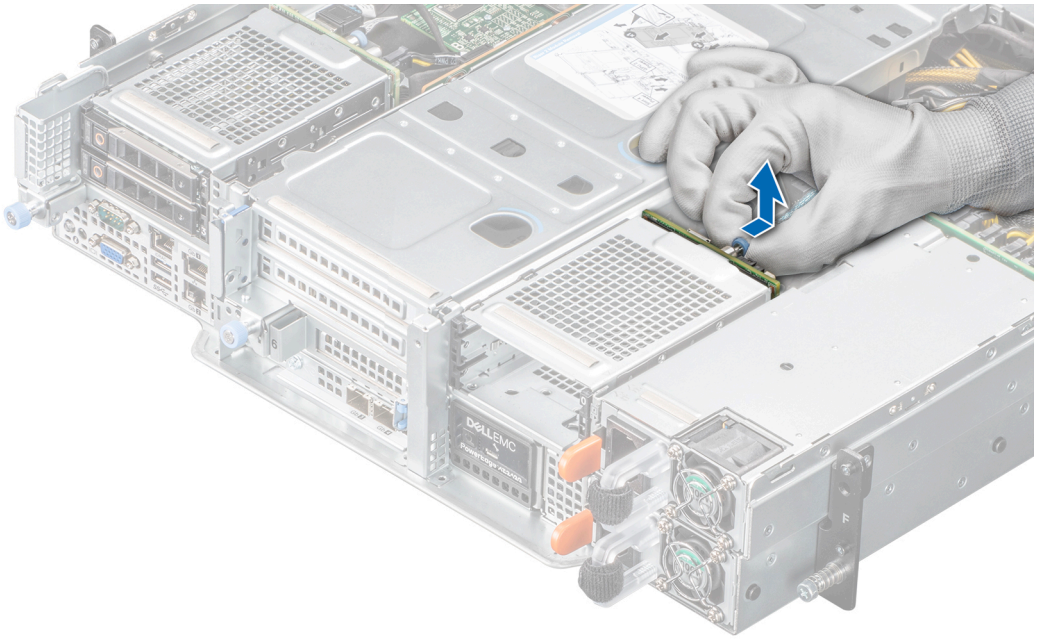


Figure 58. Removing the backplane

Next steps

Replace the drive backplane.

Installing the drive backplane

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove all the drives.

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

Steps

Insert the backplane into the guides on the drive cage and lower the backplane until the plunger click into place.

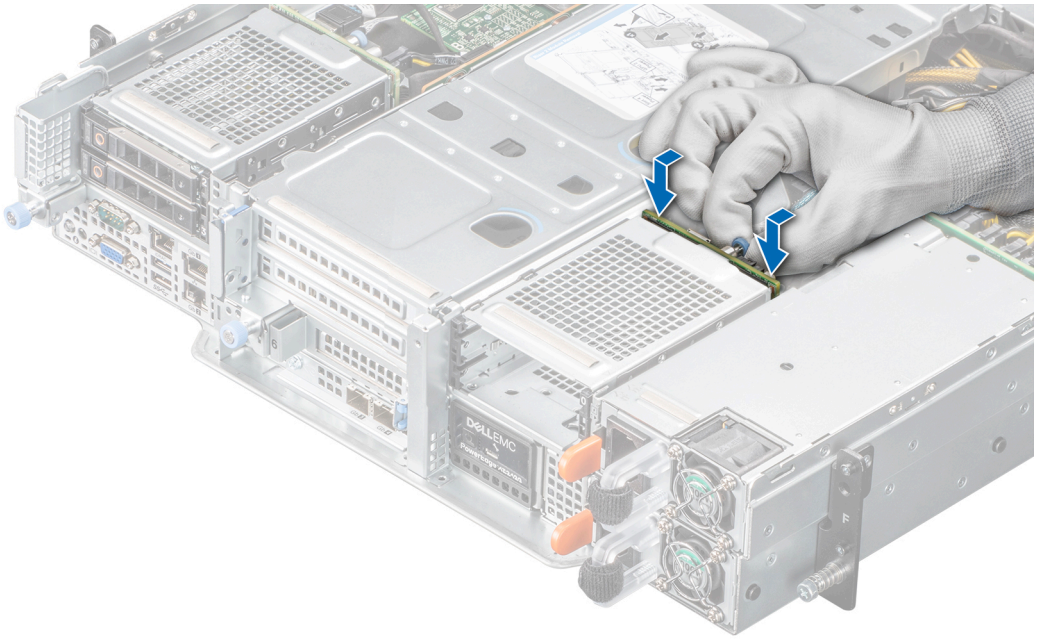


Figure 59. Installing the drive backplane

Next steps

1. Reconnect all the disconnected cables to the backplane.
2. Install all the drives.
3. Follow the procedure listed in After working inside your system.

Removing a EDSFF switch backplane

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove all the EDSFF drives.
4. Remove all the cables that are connected to the EDSFF switch backplane.
5. Remove the EDSFF switch backplane assembly.

Steps

1. Hold and pull the plunger, and slide the backplane towards rights side.
2. Lift the backplane out of the backplane tray.

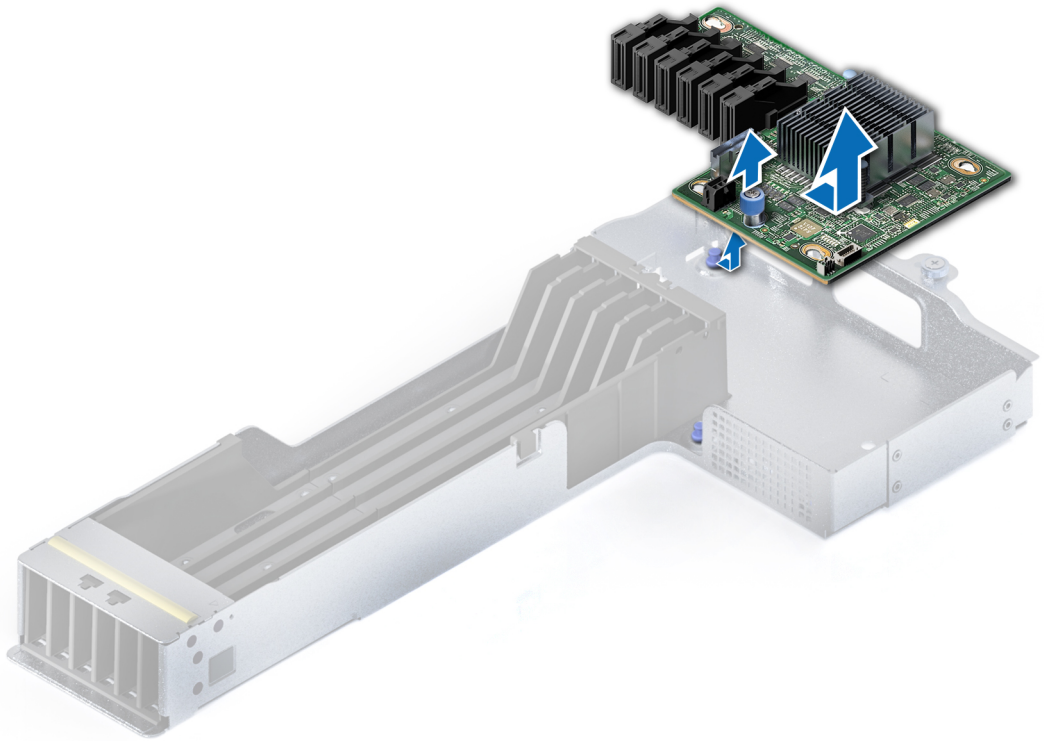


Figure 60. EDSFF switch backplane board removal

Next steps

Replace a EDSFF switch backplane.

Installing an EDSFF switch backplane

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove all the EDSFF drives.
4. Remove all the cables that are connected to the EDSFF switch backplane.
5. Remove the EDSFF switch backplane assembly.

Steps

1. Align the EDSFF switch backplane with the pins on the backplane assembly.
2. Slide the backplane towards the left until the plunger is engaged to lock the backplane on the tray.

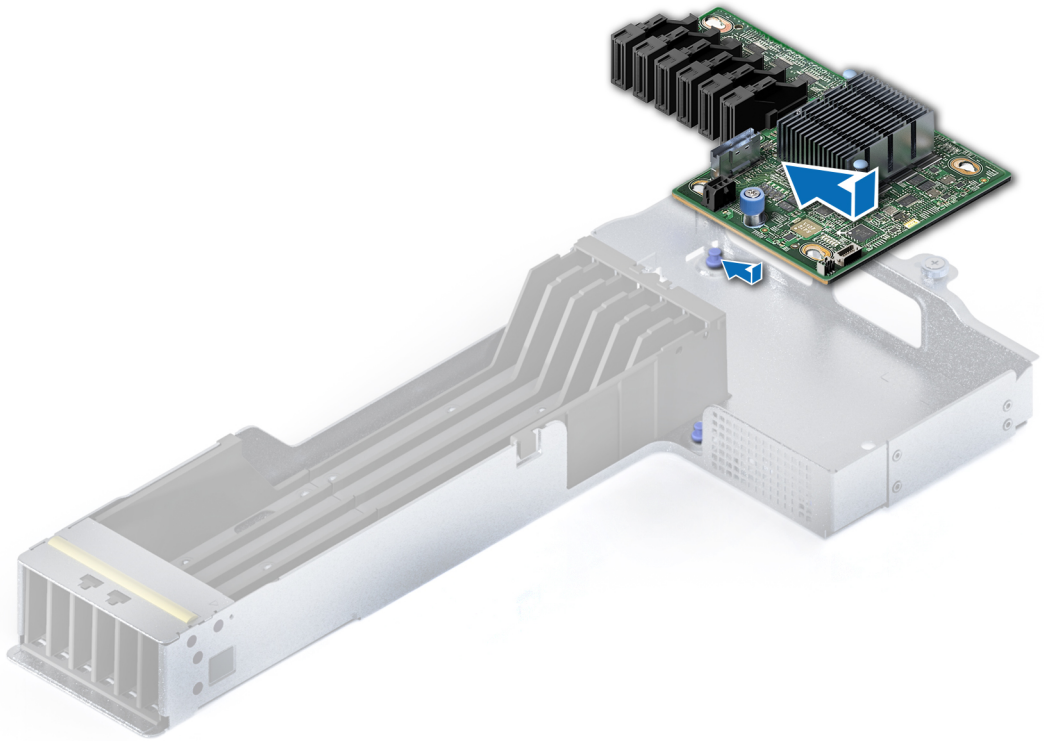


Figure 61. EDSFF switch backplane board installation

Next steps

1. Install the EDSFF switch backplane assembly.
2. Connect all the cables to the EDSFF switch backplane.
3. Install all the EDSFF drives.
4. Follow the procedure listed in After working inside your system.

Primary drive bay assembly

Removing the primary drive bay assembly

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Disconnect all the cables connected to the backplane.

NOTE: Observe the routing of the cable as you remove it from the system.

Steps

1. Loosen the blue thumb screw located at the rear of the assembly.
2. Slide the assembly towards the front to unlock the assembly.
3. Lift the assembly out of the server.

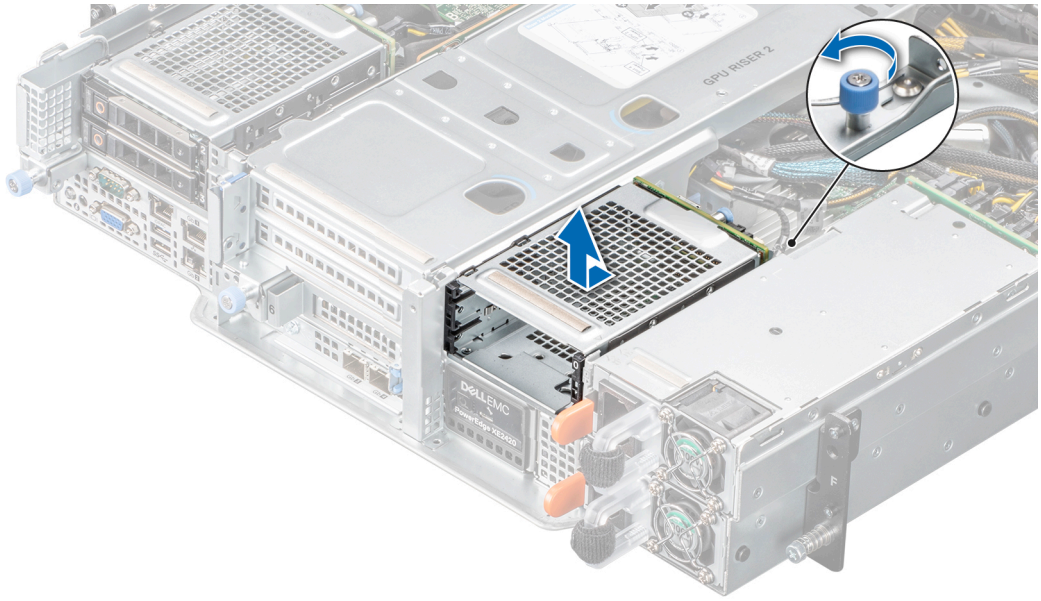


Figure 62. Removing the primary drive bay assembly

Next steps

Replace the primary drive bay assembly.

Installing the primary drive bay assembly

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.

Steps

1. Insert the backplane assembly into the guides in chassis and slide the assembly towards the rear to lock the assembly.
2. Tighten the blue thumb screw to secure the assembly with chassis.

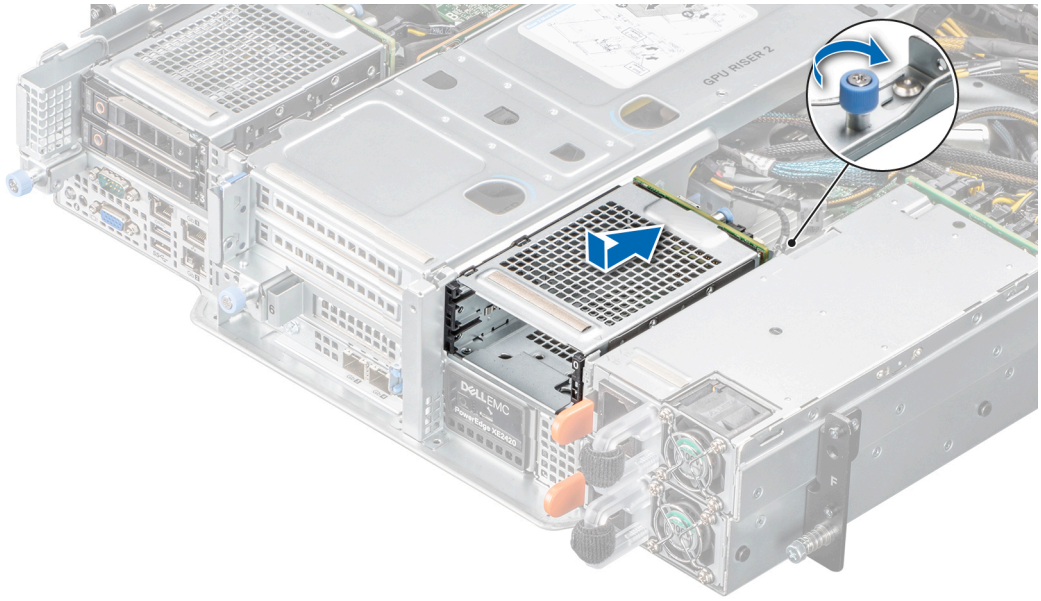


Figure 63. Installing the primary drive bay assembly

Next steps

1. Reconnect all the disconnected cables to the backplane.
2. Follow the procedure listed in After working inside your system.

Removing the second drive bay assembly

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Safety instructions.
3. Remove the GPU riser 2
4. Disconnect cables from the interposer, primary backplane 1, and PIB.

   NOTE: Observe the routing of the cable as you remove it from the system.
5. Remove the slimline cable from the riser backplane.

Steps

1. Loosen the one blue thumb screw located at the front of the assembly, and two blue thumb screws located at the rear of the assembly.
2. Hold the touch points, and lift the expansion card riser from the riser connector on the system board.

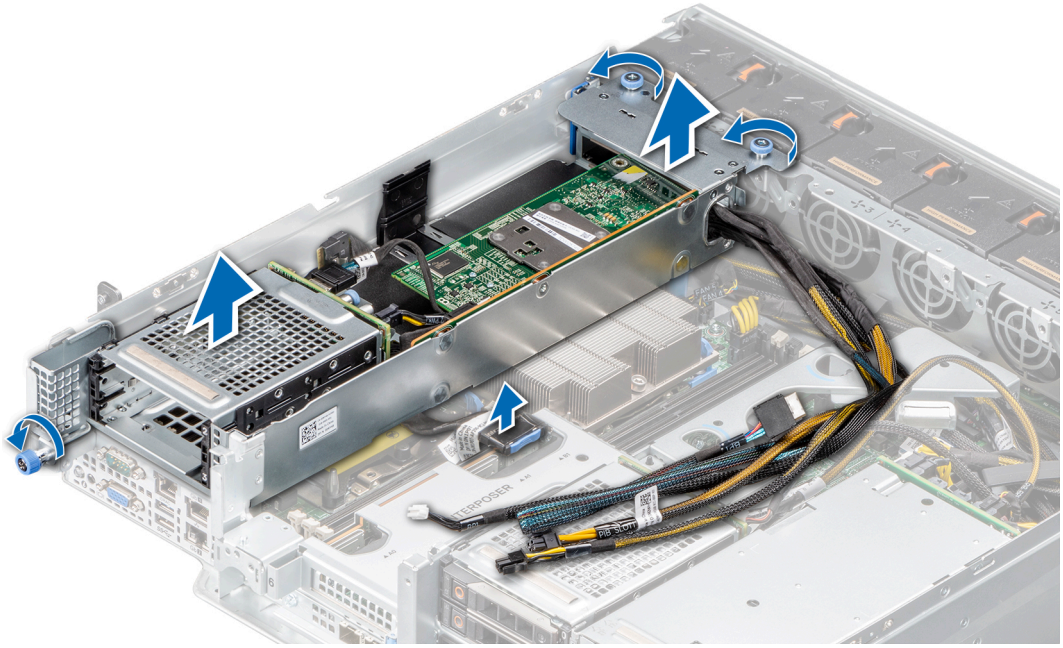


Figure 64. Removing the second drive bay assembly

Next steps

Replace the second drive bay assembly.

Installing the second drive bay assembly

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. If removed, install the drive backplane.
4. If removed, install the RAID controller card.
5. If applicable, reconnect cables to the RAID controller.

Steps

1. Holding the edges or the touch points, align the holes on the riser bracket with the guides on the chassis.
2. Lower the whole assembly into place and press the touch points until it is fully seated in place.
3. Tighten the one blue thumb screw located at the front of the assembly, and two blue thumb screws located at the rear of the assembly.

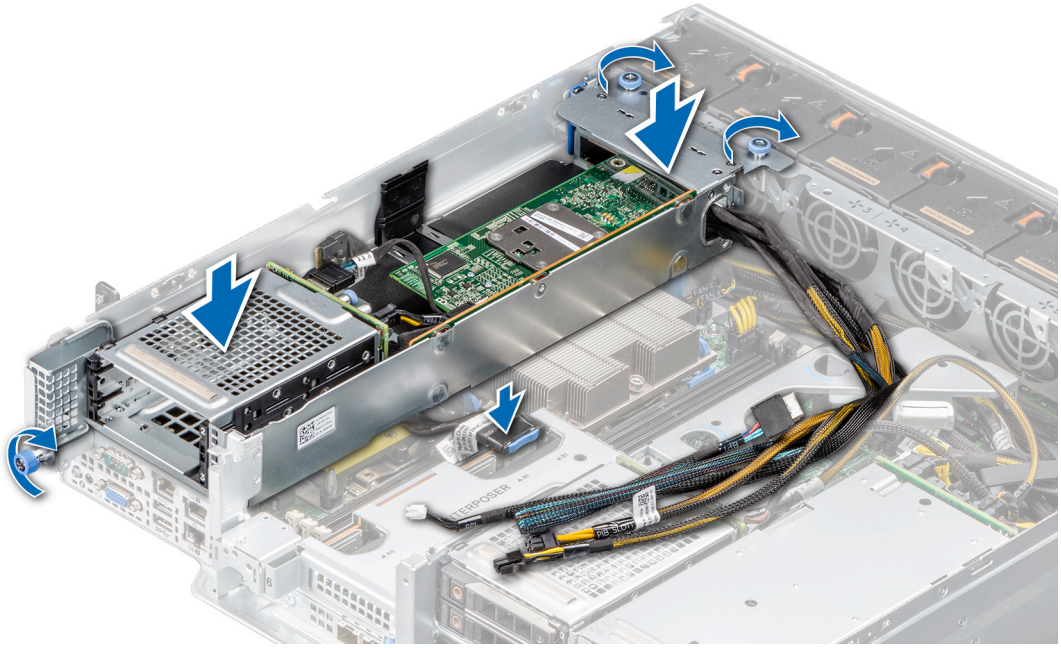


Figure 65. Removing the second drive bay assembly

Next steps

1. Connect the interposer cable at slot B1, PIB cables, cable on the primary backplane, and slimline cable on the secondary drive backplane.
2. Install the GPU riser 2
3. After working inside the system

.

Removing the EDSFF drive bay assembly

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Safety instructions.
3. Disconnect cables that are connected to the EDSFF switch backplane.

   NOTE: Observe the routing of the cable as you remove it from the system.

Steps

1. Loosen the two blue thumbscrews at the rear of the assembly.
2. Hold the touch points, and slide the assembly towards the chassis front and lift it out of the system.

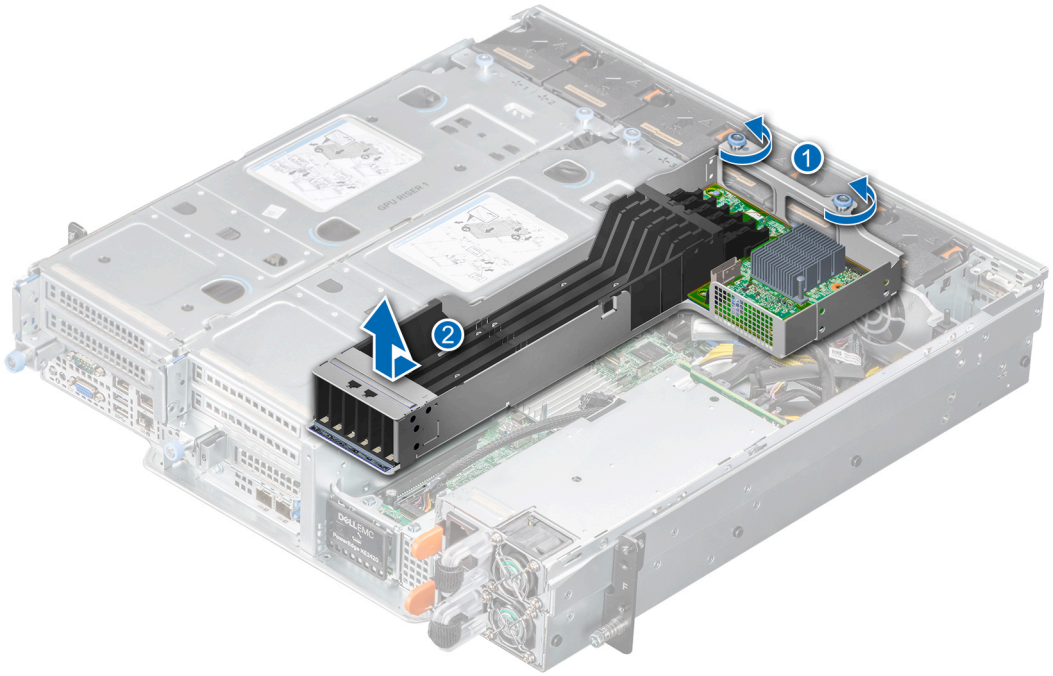


Figure 66. Removing the EDSFF drive bay assembly

Next steps

Replace the EDSFF drive bay assembly.

Installing the EDSFF drive bay assembly

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Disconnect the cables to the EDSFF switch backplane.

Steps

1. Holding the edges or the touch points, align and engage the holes on the tray assembly with the guide pins on the chassis front wall and PSU cage.
2. Slide the whole assembly to chassis back until it's fully seated in place.
3. Tighten the two blue thumbscrews at the rear of the assembly.

NOTE: The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.

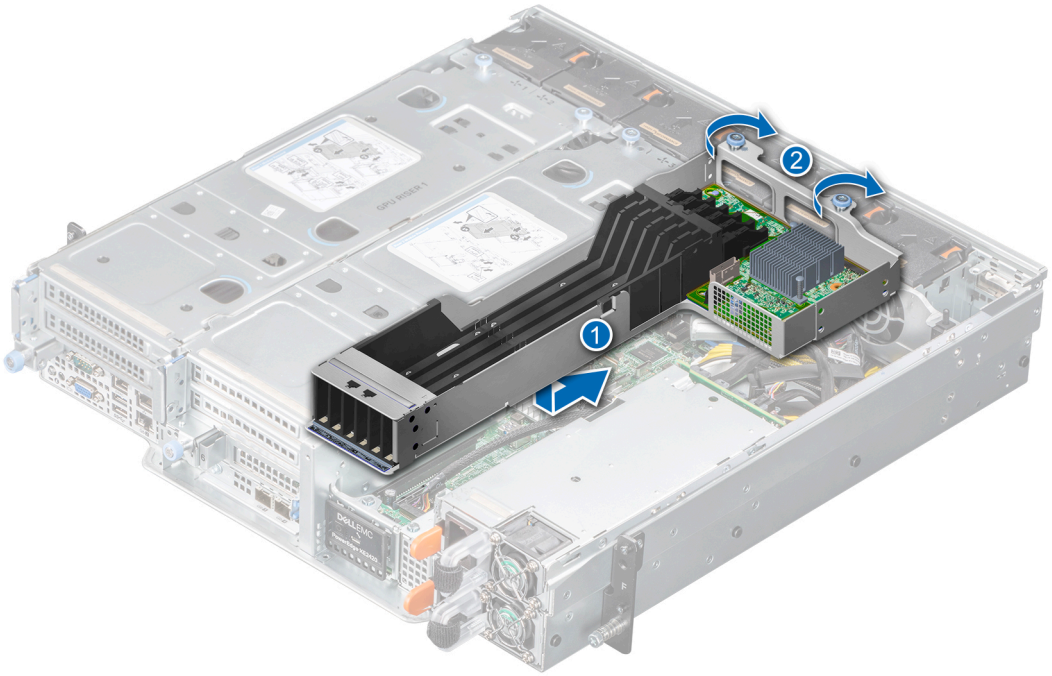


Figure 67. Installing the ESDFF drive bay assembly

Next steps

1. Connect the cables to the EDSFF switch backplane.
2. After working inside the system

.

Control panel

Removing the control panel

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the primary drive bay assembly.

Steps

1. Disconnect the control panel cable from the control panel connector.

   NOTE: Observe the routing of the cable as you remove it from the system.

2. Using a Phillips #1 screwdriver, remove the screws that secure the control panel assembly to the server chassis.
3. Move the control panel assembly towards the left to release the lock and pull the assembly out of the server chassis.

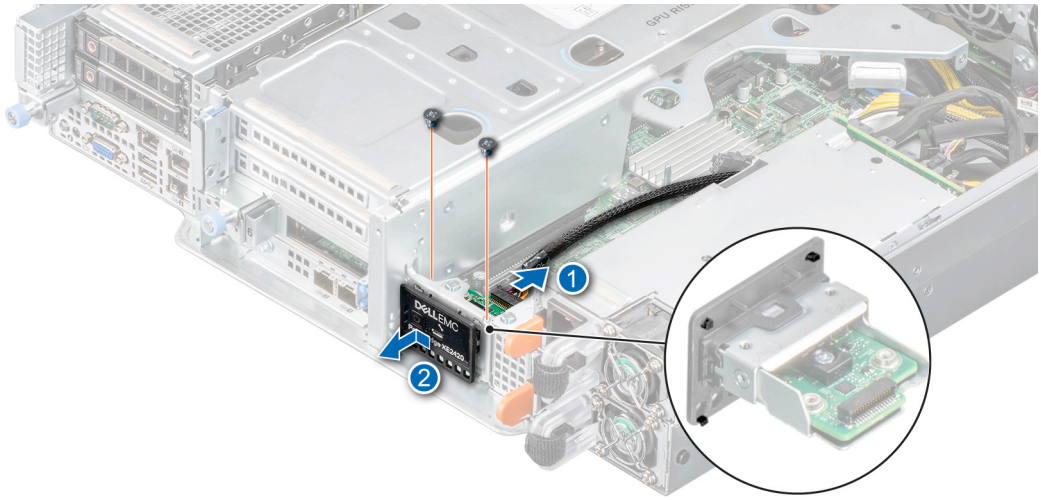


Figure 68. Control panel assembly removal

Next steps

Replace the control panel.

Installing the control panel

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the primary drive bay assembly.

Steps

1. Align the 4 hooks located on the back side of the plastic panel, and insert the control panel assembly in the server chassis.
2. Slide the assembly towards the right to lock the assembly on the server chassis.
3. Using the Phillips #1 screwdriver, tighten the screws to secure the control panel assembly to the system chassis.

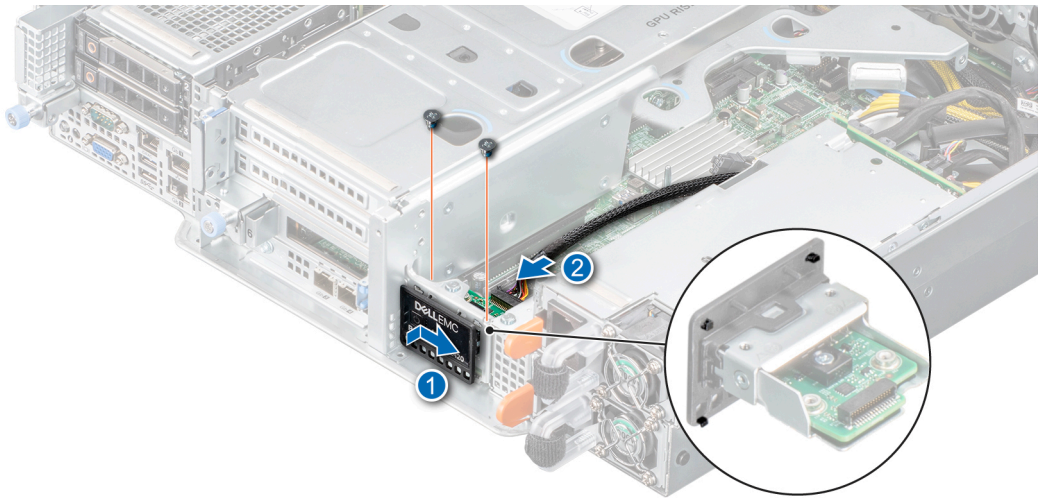


Figure 69. Installing the control panel assembly

Next steps

1. Reconnect the control panel cable to the control panel connector.
2. Replace the primary drive backplane assembly.
3. Follow the procedure listed in the After working inside your system.

Cable routing

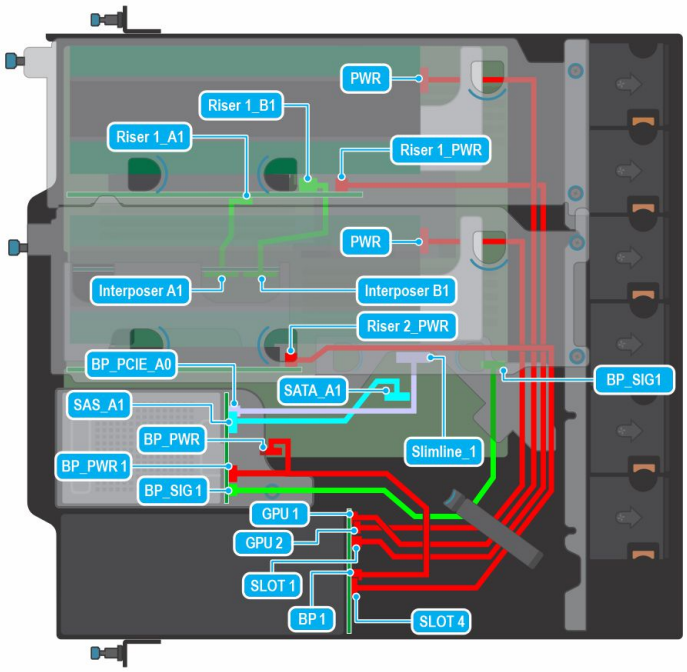


Figure 70. Cable routing - 2 x 2.5-inch drive backplane

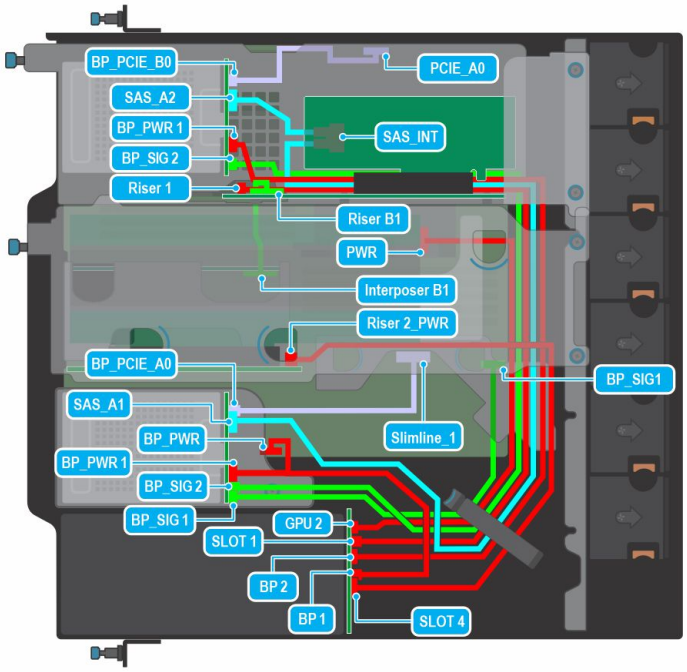


Figure 71. Cable routing - 4 x 2.5-inch drive backplane

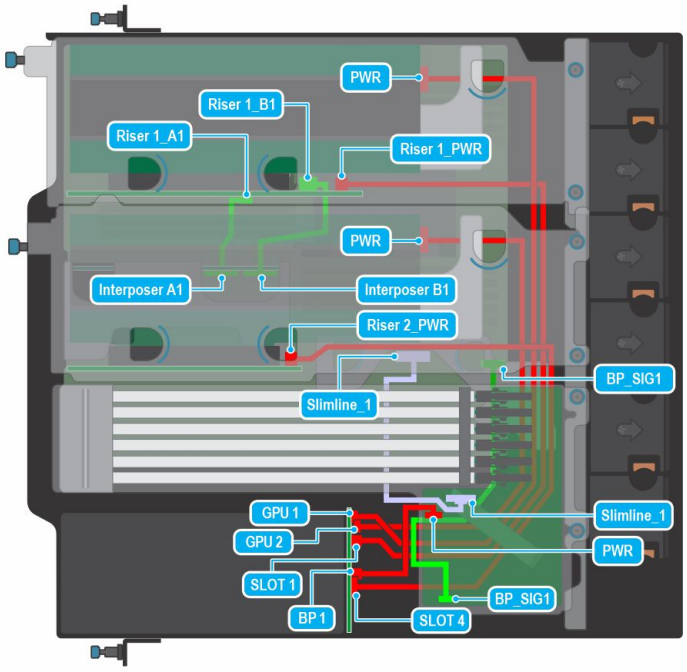


Figure 72. Cable routing - 6 x EDSFF switch backplane

PERC

Removing the PERC from the second drive bay assembly

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the second drive bay assembly.

Steps

1. Open the PCIe card holder latch.
2. Rotate the second drive bay assembly to press the card holder lock, and slide to release the card holder.
3. Hold the PERC card by its edges, and pull the card until the card edge connector disengages from the expansion card connector on the assembly.

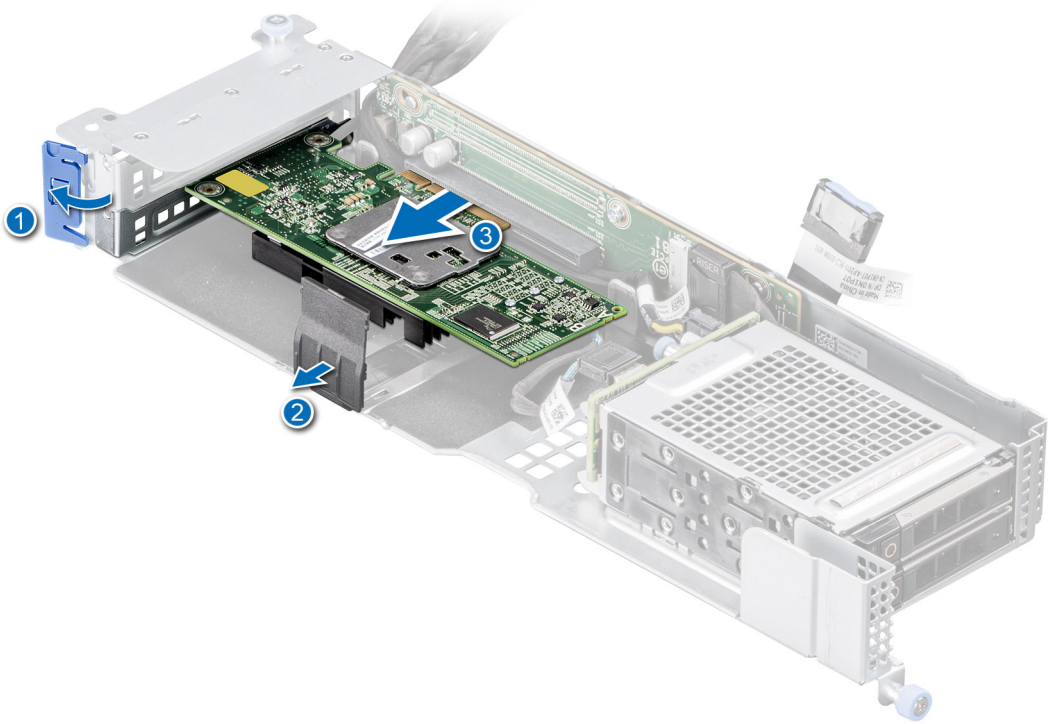


Figure 73. Raid card removal

4. Disconnect the RAID SAS cable from the RAID card.
5. Install a filler bracket if you are not replacing the expansion card.

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 and dirt out of the system and aid in proper cooling and airflow inside the system.

Next steps

Replace the PERC card.

Installing the PERC into the second drive bay assembly

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. If installing a new PERC card, unpack it and prepare the card for installation.

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

4. Remove the GPU riser 2
5. Remove the second drive bay assembly.

Steps

1. Open the PCIe card holder latch.
2. If installed, remove the filler bracket.

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

3. Connect the RAID SAS cable to the RAID card and route the cable before installing.

4. Hold the card by its edges, and align the card edge connector with the expansion card connector on the riser.
5. Insert the card edge connector firmly into the expansion card connector until the card is fully seated.
6. Press the card holder to lock the card.
7. Close the PCIe card holder latch.

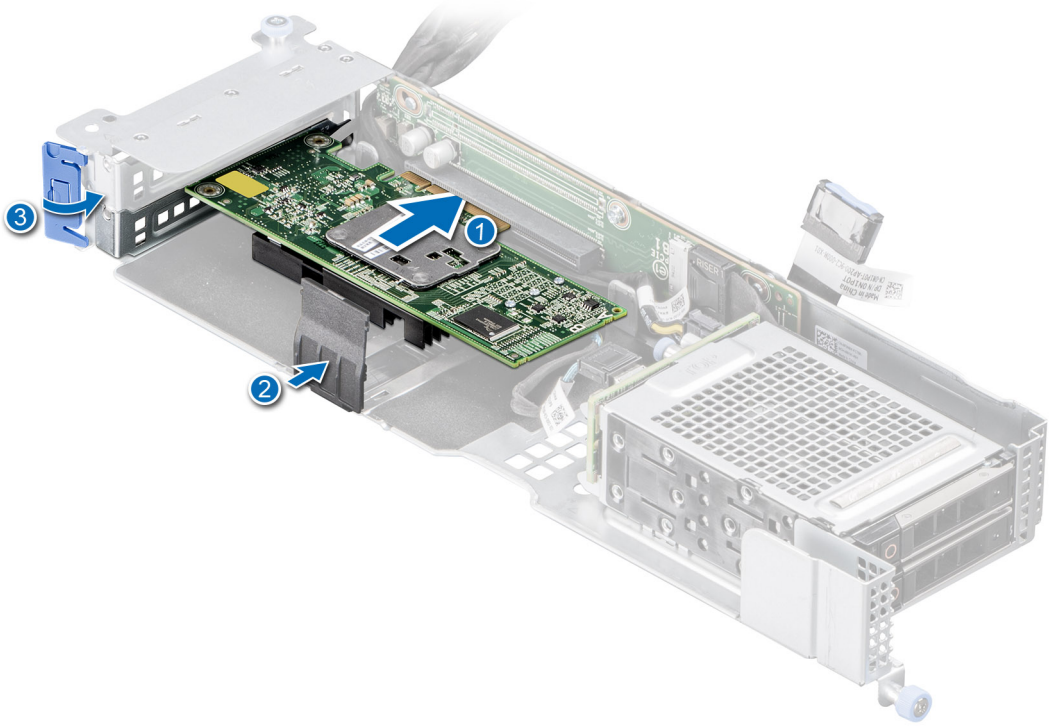


Figure 74. Raid card installation

Next steps

1. Install the second drive bay assembly.
2. Install GPU riser 2
3. After working inside the 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 the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2.
4. Remove the second drive bay assembly or GPU riser 1

Steps

Hold the air shroud touch points at both ends and lift the air shroud out of the system.

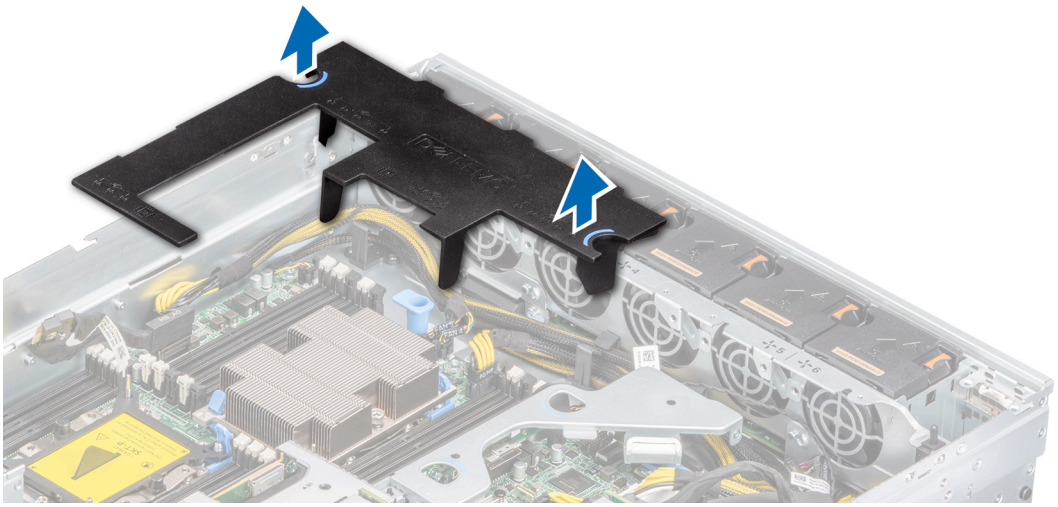


Figure 75. Removing the air shroud

Next steps

Replace the air shroud.

Installing the air shroud

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2.
4. Remove the second drive bay assembly or GPU riser 1

Steps

1. Align the slot on the air shroud with the standoff on the chassis.
2. Lower the air shroud into the system until it is firmly seated.

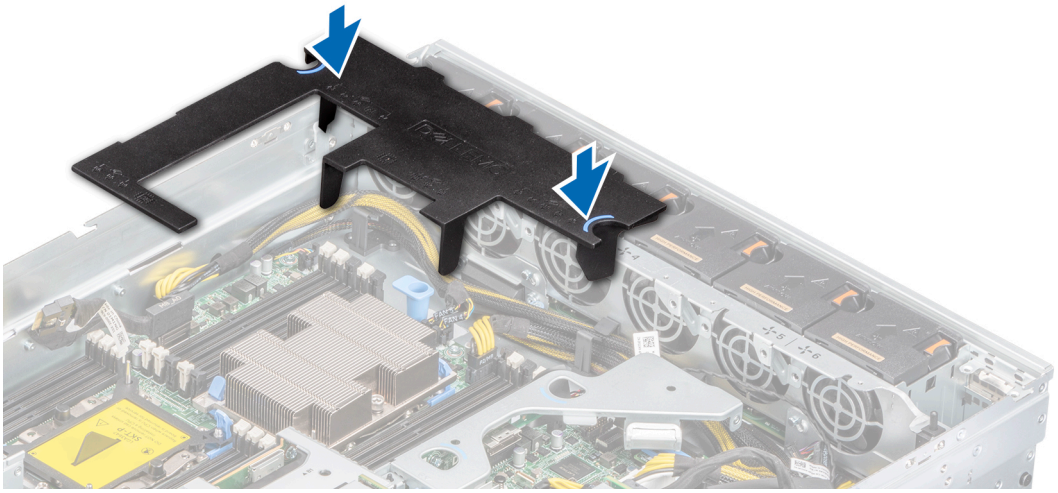


Figure 76. Installing the air shroud

Next steps

1. Install the GPU riser 1 or Second drive bay assembly.
2. Install the GPU riser 2.
3. Follow the procedure listed in After working inside your system.

Intrusion switch module

Removing the intrusion switch

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2.
4. Remove the NVME riser.
5. Keep the plastic scribe ready.

Steps

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

   Observe the routing of the cable as you remove it from the system.

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

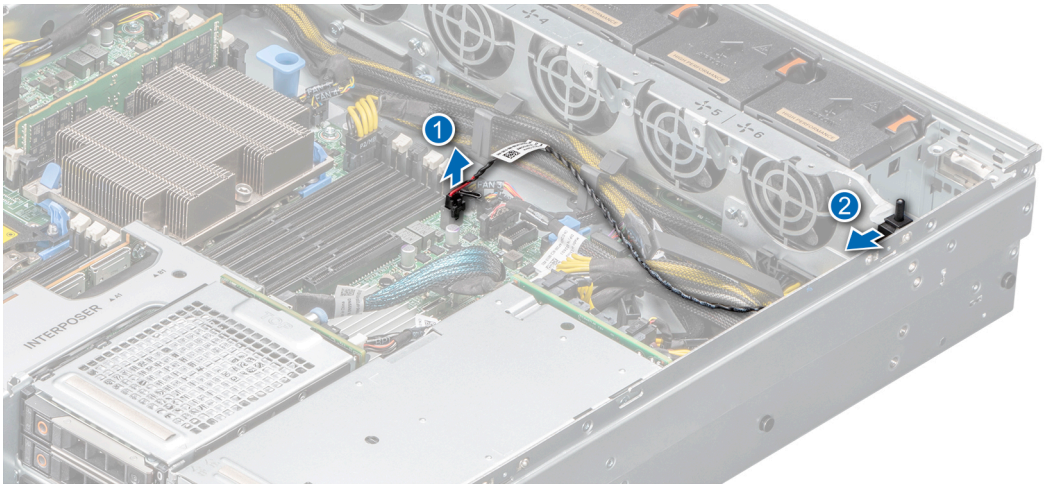


Figure 77. Intrusion switch removal

Next steps

Replace the intrusion switch.

Installing the intrusion switch

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2.
4. Remove the NVME riser.

Steps

1. Align and slide the intrusion switch in the slot until it is firmly seated in the slot on the system.

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

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

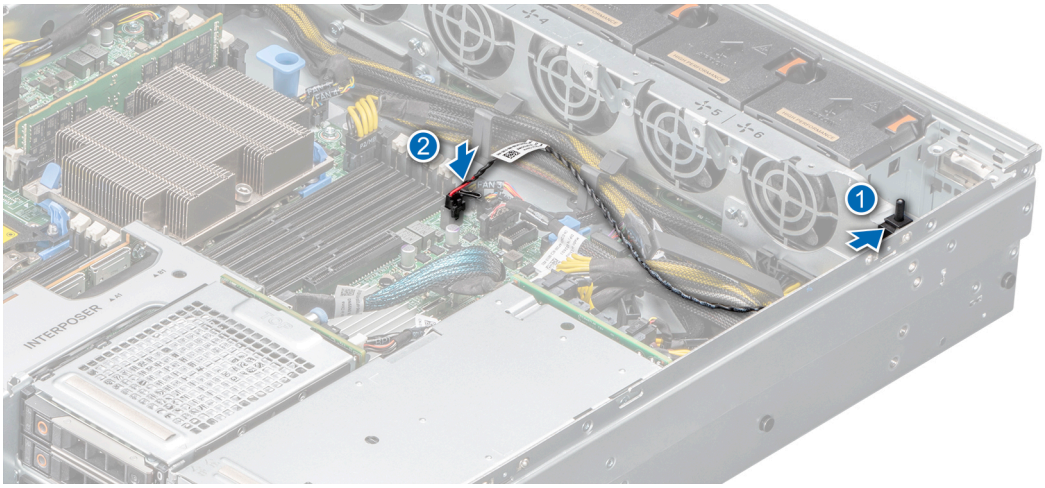


Figure 78. Intrusion switch installation

Next steps

1. Install the NVME riser.
2. Install the GPU riser 2.
3. Follow the procedure listed in After working inside your system.

System memory

System memory guidelines

The PowerEdge XE2420 system supports DDR4 registered DIMMs (RDIMMs) and load reduced DIMMs (LRDIMMs). System memory holds the instructions that are executed by the processor.

Your system memory is organized into eight channels per processor (two memory sockets per channel) for a total of 16 memory sockets, where CPU 1 supports 10 DIMMs, and CPU 2 supports 6 DIMMS. In each channel, the 1st socket is marked white and the 2nd socket black.

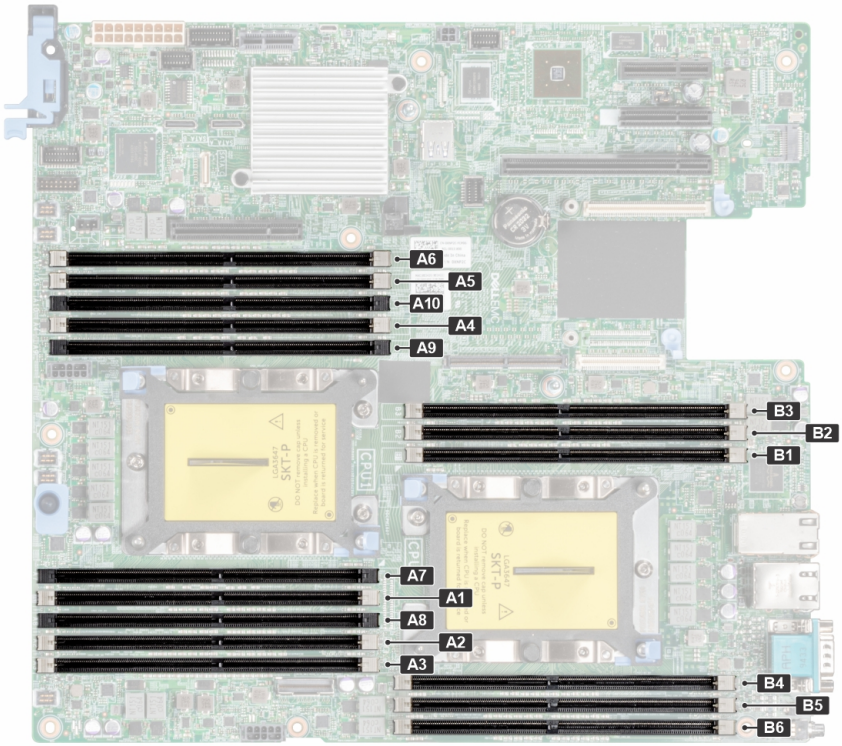


Figure 79. Memory socket location

Memory channels are organized as follows:

Table 37. Memory channels

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

Table 38. Supported memory matrix

DIMM type	Rank type	Capacity	DIMM rated voltage and maximum speed	Operating Speed	
				1 DIMMs per Channel (DPC)	2 DIMMs per Channel (DPC)
RDIMM	1R	8 GB	DDR4 (1.2V), 2666 MT/s	2666 MT/s	2666 MT/s
	2R	16 GB, 32 GB, 64 GB	DDR4 (1.2V), 2933 MT/s	2933 MT/s	2933 MT/s
LRDIMM	4R, 8R	64 GB, 128 GB	DDR4 (1.2V), 2666 MT/s	2666 MT/s	2666 MT/s

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 frequency can be 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 speed of the DIMMs

NOTE: MT/s indicates DIMM speed in Mega-Transfers 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:

Table 39. DIMM type mix table

DIMM type	RDIMM	LRDIMM	3DS/TSV LRDIMM
RDIMM	allowed	Not allowed	Not allowed
LRDIMM	Not allowed	Allowed	Not allowed
3DS/TSV LRDIMM	Not allowed	Not allowed	allowed

- All DIMMs must be DDR4.
- 64 GB LRDIMMs that are DDP (Dual Die Package) LRDIMMs must not be mixed with 128 GB LRDIMMs that are TSV (Through Silicon Via/3DS) LRDIMMs.
- x4 and x8 DRAM-based memory modules can be mixed.
- Up to two RDIMMs can be populated per channel regardless of rank count.
- Up to two LRDIMMs 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 operate at the speed of the slowest installed memory modules.
- 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.

  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.

  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.

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 a system is not supported.
- Unbalanced memory configurations 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.

Mode-specific guidelines

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

Table 40. 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.
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.

Table 40. Memory operating modes (continued)

Memory Operating Mode	Description
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 41. 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. • 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	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.

Table 41. Memory population rules (continued)

Processor	Configuration	Memory population	Memory population information
starting with processor1)			• 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.

Table 42. Optimized population rules for single processor

Single processor	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
1 DIMM	✓	–	–	–	–	–	–	–	–	–
2 DIMMs	✓	✓	–	–	–	–	–	–	–	–
3 DIMMs	✓	✓	✓	–	–	–	–	–	–	–
4 DIMMs (Exception from traditional rules)	✓	✓	–	✓	✓	–	–	–	–	–
5 DIMMs	✓	✓	✓	✓	✓	–	–	–	–	–
6 DIMMs (Recommended for best performance)	✓	✓	✓	✓	✓	✓	–	–	–	–
7 DIMMs	✓	✓	✓	✓	✓	✓	✓	–	–	–
8 DIMMs (Exception from traditional rules)	✓	✓	–	✓	✓	–	✓	✓	✓	✓
9 DIMMs	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
10 DIMMs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 43. Optimized population rules for dual processor

Dual processor	Processor 1										Processor 2					
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	B6
2 DIMM	✓	–	–	–	–	–	–	–	–	–	✓	–	–	–	–	–
4 DIMMs	✓	✓	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–
6 DIMMs	✓	✓	✓	–	–	–	–	–	–	–	✓	✓	✓	–	–	–
8 DIMMs (Exception from traditional rules)	✓	✓	–	✓	✓	–	–	–	–	–	✓	✓	–	✓	✓	–
10 DIMMs	✓	✓	✓	✓	✓	–	–	–	–	–	✓	✓	✓	✓	✓	–
12 DIMMs (Recommended for best performance)	✓	✓	✓	✓	✓	✓	–	–	–	–	✓	✓	✓	✓	✓	✓
13 DIMMs	✓	✓	✓	✓	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	✓
14 DIMMs (Exception from traditional rules)	✓	✓	–	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15 DIMMs	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16 DIMMs (Recommended for best performance)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Removing a memory module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2.
4. Remove the GPU riser 1 or second drive bay assembly.
5. Remove the air shroud.

WARNING: The memory modules are hot to touch for some time after the system has been powered off. Allow the memory modules to cool before handling them.

Steps

1. Locate the appropriate memory module socket.
2. To release the memory module from the socket, simultaneously press the ejectors on both ends of the memory module socket to fully open.

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

3. Lift the memory module away from the system.

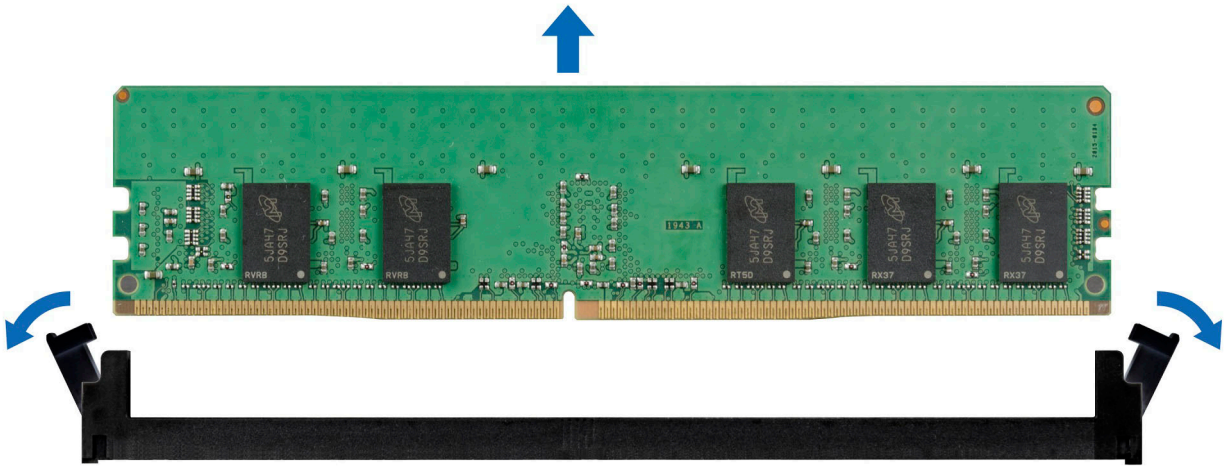


Figure 80. Removing a memory module

Next steps

Replace the memory module.

Installing a memory module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2.
4. Remove the GPU riser 1 or second drive bay assembly.
5. Remove the air shroud.

Steps

1. Locate the appropriate memory module socket.

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

2. If a memory module is installed in the socket, remove it.

   NOTE: Ensure the socket ejector latches are fully open, before installing the memory module.

3. Align the edge connector of the memory module with the alignment key of the memory module socket, and insert the memory module in the socket.

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

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

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

4. Press the memory module with your thumbs until the ejectors firmly click into place. When the memory module is properly seated in the socket, the levers on the memory module socket align with the levers on the other sockets that have memory modules installed.

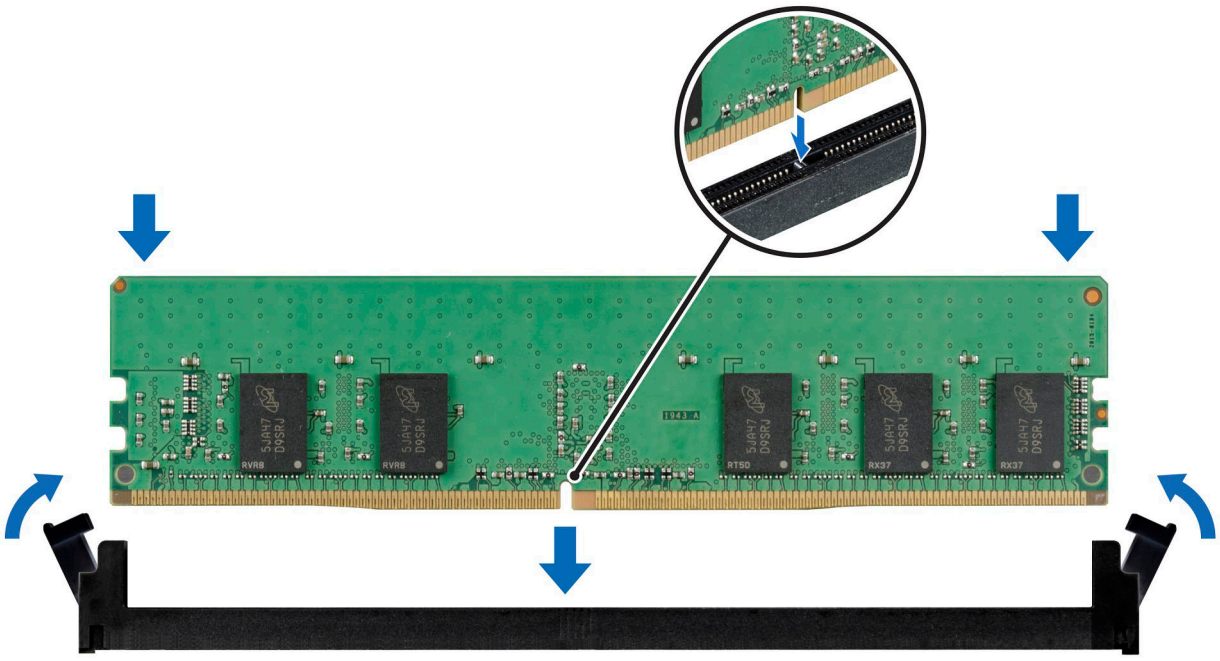


Figure 81. Installing a memory module

Next steps

1. Install the air shroud.
2. Install the GPU riser 1 or second drive bay assembly.
3. Install the GPU riser 2.
4. Follow the procedure listed in After working inside your system.
5. 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.
6. If the System Memory Size is incorrect, one or more of the memory modules may not be installed properly. Ensure that the memory modules are firmly seated in their sockets.
7. Run the system memory test in system diagnostics.

Expansion cards and expansion card risers

NOTE: A system event entry is logged in the iDRAC Lifecycle Controller if an expansion card riser is not supported or missing. It does not prevent your system from turning on.

Expansion card installation guidelines

The PowerEdge XE2420 system supports up to two PCI express (PCIe) expansion cards:

Table 44. Expansion card slots supported on the system board

Configurations	PCIe slot	Riser	PCIe slot height	PCIe slot length	Slot width
1A	1	OCP (Signal x8)	NA	NA	NA
	2, 3	One x16 (Signal x16)	Full	Half/Full	Double

Table 44. Expansion card slots supported on the system board (continued)

Configurations	PCIe slot	Riser	PCIe slot height	PCIe slot length	Slot width
		Two x16 (Signal x8)	Full	Half/Full	Single
	4, 5	One x16 (Signal x16)	Full	Half/Full	Double
		Two x16 (Signal x8)	Full	Half/Full	Single
	6	x8 PCIe	LP	Half	Single
	7	BOSS (Signal x4)	NA	NA	NA
2C	1	OCP (Signal x8)	NA	NA	NA
	Slot 2: One x8 LP PERC (with FH bracket)	x16 (Signal x8)	Full	Half	Single
	4, 5	One x16 (Signal x16)	Full	Half/Full	Double
		Two x16 (Signal x8)	Full	Half/Full	Single
	6	x8 PCIe	LP	Half	Single
	7	BOSS (Signal x4)	NA	NA	NA
3A	1	OCP (Signal x8)	NA	NA	NA
	2, 3	One x16 (Signal x16)	Full	Half/Full	Double
		Two x16 (Signal x8)			
	4, 5	One x16 (Signal x16)	Full	Half/Full	Single
		Two x16 (Signal x8)			
	6	x8 PCIe	LP	Half	Single
	7	BOSS (Signal x4)	NA	NA	NA

NOTE: The expansion-card slots are not hot-swappable.

Table 45. Riser configuration 1A

Card type	Slot priority	Maximum number of cards
Intel (Adapter card)	3, 5, 4, 2	4
Xilinx (Adapter card)	3, 5	2
Dell PCIe (Controller card)	3, 5	2
Intel FPGA programmable accelerator card N3000 (Network card)	3, 5, 4, 2	4

Table 45. Riser configuration 1A (continued)

Card type	Slot priority	Maximum number of cards
Intel NVMe PCIe SSD	6	1
Broadcom (25 G PCIe FH)	3, 5, 4, 2	4
Broadcom (25 G PCIe LP)	6	1
Intel 25 G (SFP)	3, 5, 4, 2	4
Intel 25 G (SFP LP)	6	1
Mellanox 100 G (CX6 H100)	3, 5	2
Internal storage (BOSS)	7	1
Nvidia GPU DW	3, 5	2
Nvidia T4 GPU SW	3, 5, 4, 2	4
OCP (2x10 G)/(2x25 G)	1	1

Table 46. Riser configuration 2C

Card type	Slot priority	Maximum number of cards
Dell PCIe RAID (HBA330, H330+, H730P +, H740P)	2	1
Intel (Adapter card)	5, 4	2
Xilinx (Adapter card)	5	1
Dell PCIe (Controller card)	5	1
Intel FPGA programmable accelerator card N3000 (Network card)	5, 4	2
Intel NVMe PCIe SSD	6	1
Broadcom (25 G PCIe FH)	5, 4	2
Broadcom (25 G PCIe LP)	6	1
Intel 25 G (SFP)	5, 4	2
Intel 25 G (SFP LP)	6	1
Mellanox 100 G (CX6 H100)	5, 4	2
Internal storage (BOSS)	7	1
Nvidia GPU DW	5	1
Nvidia T4 GPU SW	5, 4	2
OCP (2x10 G)/(2x25 G)	1	1

Table 47. Riser configuration 3A

Card type	Slot priority	Maximum number of cards
Intel (Adapter card)	3, 5, 4, 2	4
Xilinx (Adapter card)	3, 5	2
Dell PCIe (Controller card)	3, 5	2
Intel FPGA programmable accelerator card N3000 (Network card)	3, 5, 4, 2	4
Intel NVMe PCIe SSD	6	1
Broadcom (25 G PCIe FH)	3, 5, 4, 2	4

Table 47. Riser configuration 3A (continued)

Card type	Slot priority	Maximum number of cards
Broadcom (25 G PCIe LP)	6	1
Intel 25 G (SFP)	3, 5, 4, 2	4
Intel 25 G (SFP LP)	6	1
Mellanox 100 G (CX6 H100)	3, 5	2
Internal storage (BOSS)	7	1
Nvidia GPU DW	3, 5	2
Nvidia T4 GPU SW	3, 5, 4, 2	4
OCP (2x10 G)/(2x25 G)	1	1

Removing the GPU riser 2

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.

Steps

1. Disconnect the cables connecting to PIB.
2. Loosen the one blue thumbscrew at the front of the assembly, and two blue thumbscrews at the rear of the assembly.
3. Hold the touch points, and lift the expansion card riser from the riser connector on the system board.

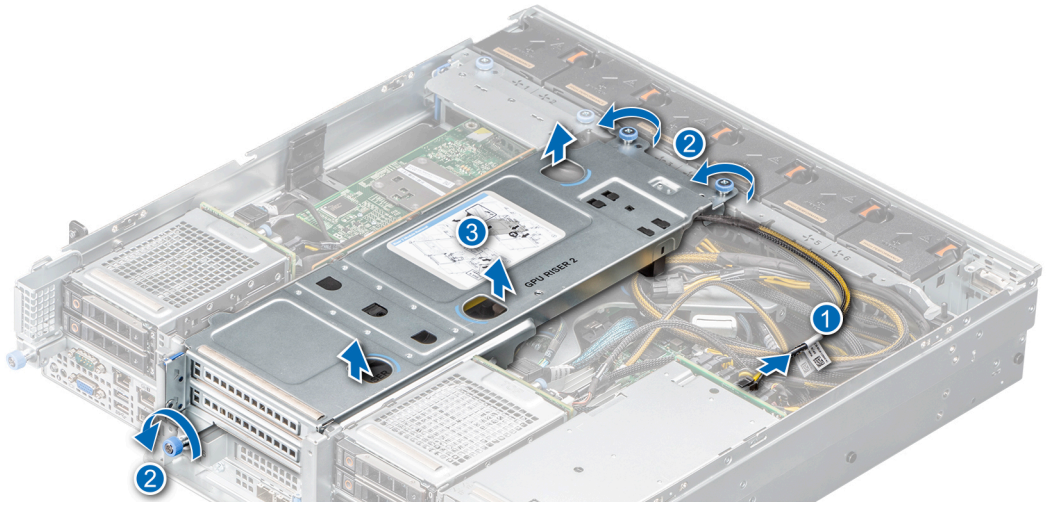


Figure 82. GPU riser 2 removal

Next steps

Replace the primary backplane assembly.

Installing the GPU riser 2

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.

3. If removed, install the GPU into the GPU riser.
4. If removed, install the network daughter card.
5. If removed, install the interposer.
6. If removed, install GPU riser 1 or second drive bay assembly.

Steps

1. Holding the edges or the touch points, align the holes on the GPU riser bracket with the guides on the chassis.
2. Lower the GPU riser bracket into place and press the touch points until the expansion card riser connector is fully seated on the system board connector.
3. Tighten the one blue thumb screw located at the front of the assembly, and two blue thumb screws located at the rear of the assembly.
4. Re-connect the cables to the power interposer board.

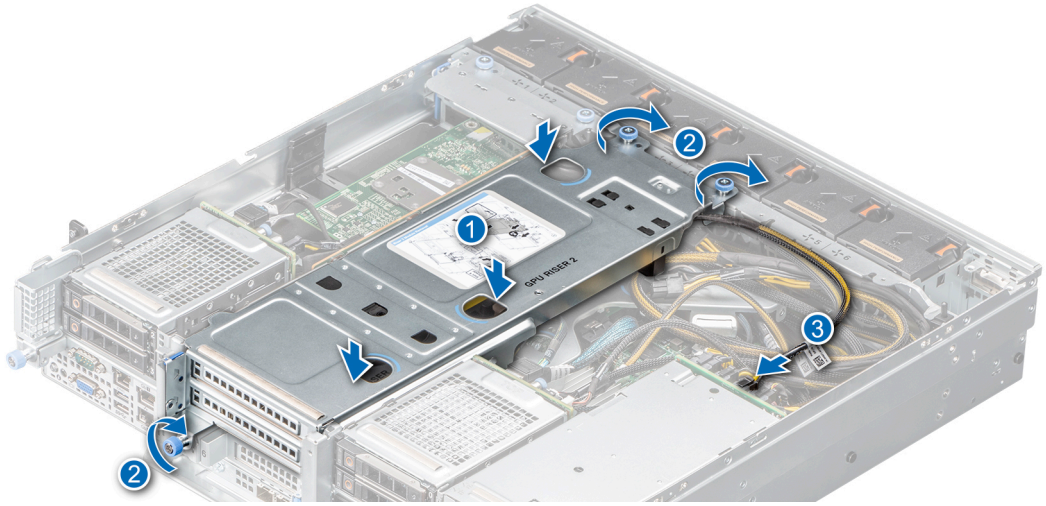


Figure 83. GPU riser 2 installation

Next steps

After working inside the system.

Removing GPU from GPU riser

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2 or GPU riser 1.
4. If applicable, disconnect the cables connected to the GPU.

Steps

1. Open the GPU card holder latch.
2. Press the lock on the bottom of the GPU riser, and slide to release the card holder.
3. Hold the GPU, and pull the GPU until the card edge connector disengages from the expansion card connector on the riser.

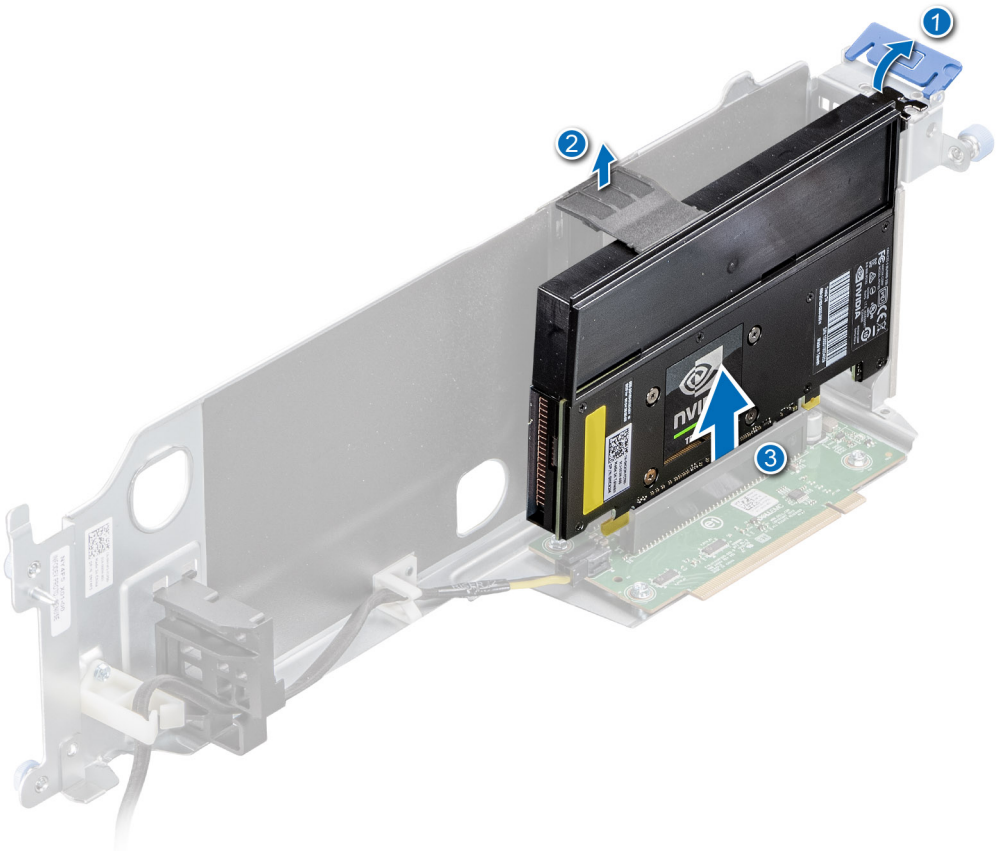


Figure 84. Removing the GPU from GPU riser 2

4. Install a dummy GPU filler if you are not replacing the GPU.

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

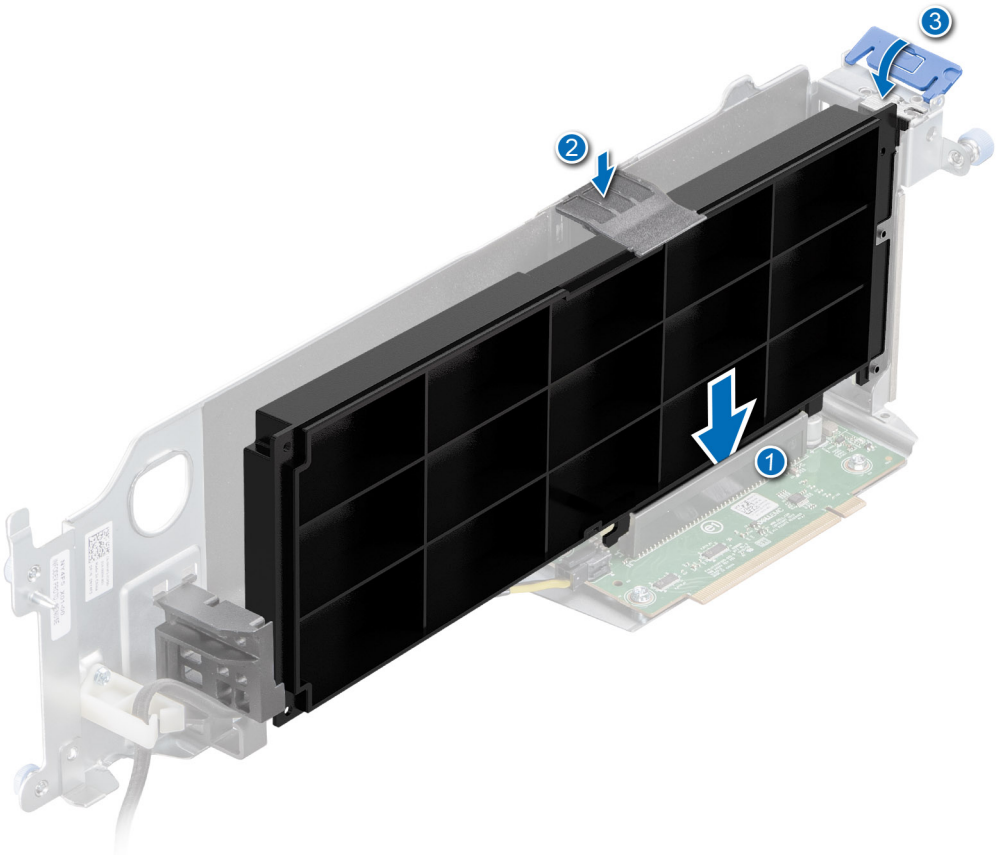


Figure 85. Dummy GPU filler installation

Next steps

Replace the GPU card into GPU riser.

Installing the GPU into the GPU riser

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. If installing a new expansion card, unpack it and prepare the card for installation.

   NOTE: For instructions, see the documentation accompanying the card.
4. Remove the GPU riser 2 or GPU riser 1
5. If applicable, disconnect the cables connected to the GPU.

Steps

1. Open the PCIe card holder.
2. If installed, remove the dummy GPU filler.

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

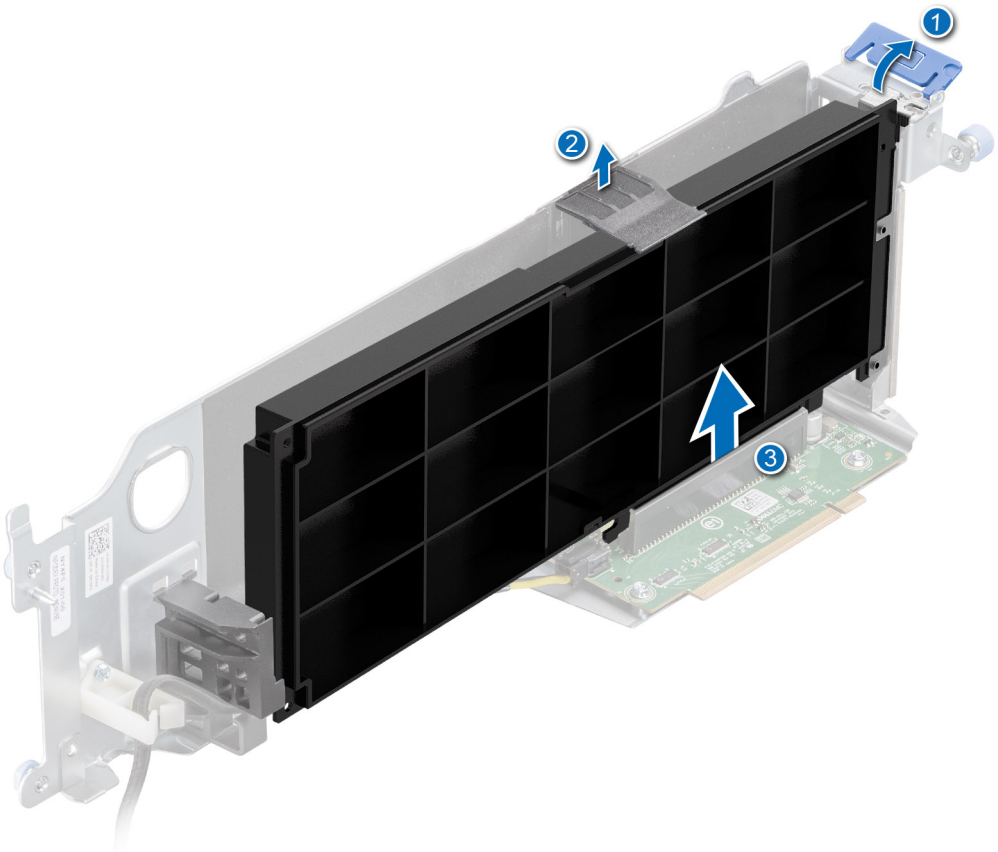


Figure 86. Dummy GPU filler removal

3. Hold the GPU card, and align the card edge connector with the expansion card connector on the riser.
4. Insert the GPU edge connector firmly into the expansion card connector until the card is fully seated.
5. Close the PCIe card holder.
6. Close the expansion card latch.

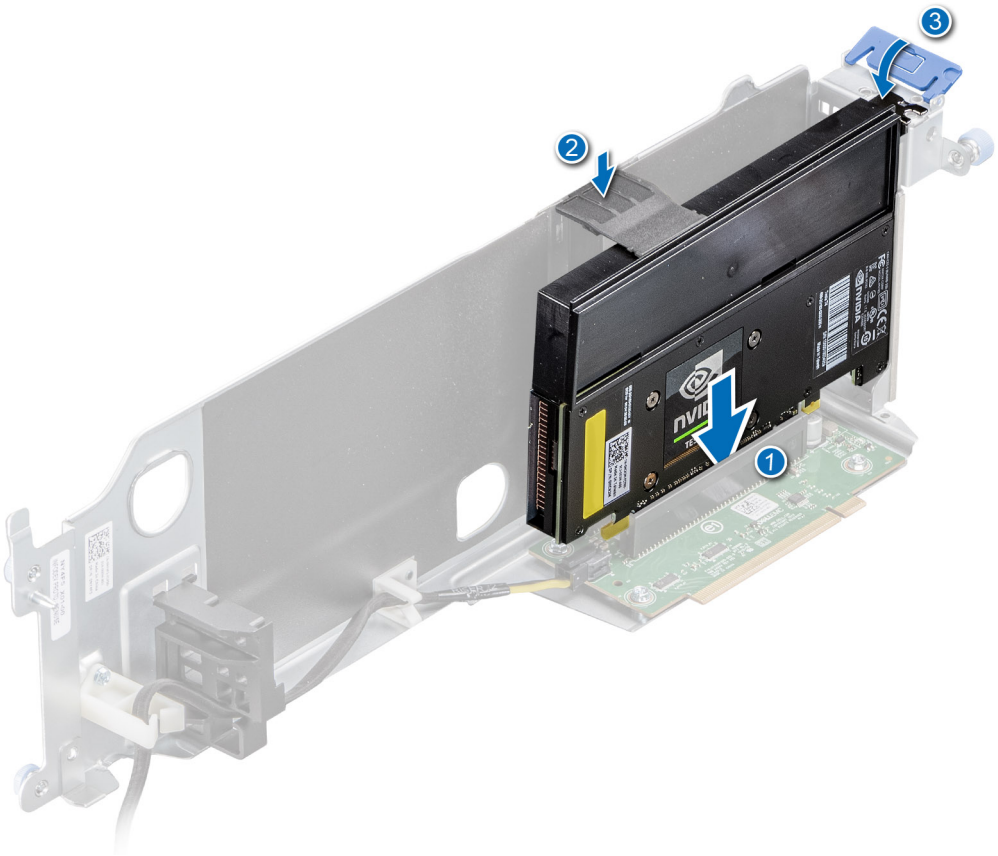


Figure 87. Installing the GPU into the GPU riser

Next steps

1. If applicable, connect the GPU cables.
2. Install GPU riser 1 or GPU riser 2
3. After working inside the system

.

Removing the GPU riser 1

Prerequisites

1. Follow the safety guidelines listed in the Safety instruction.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2

Steps

1. Disconnect the cables connecting the interposer and PIB.
2. Loosen the one blue thumb screw located at the front of the assembly, and two blue thumb screws located at the rear or the assembly.
3. Hold the touch points, and lift the expansion card riser.

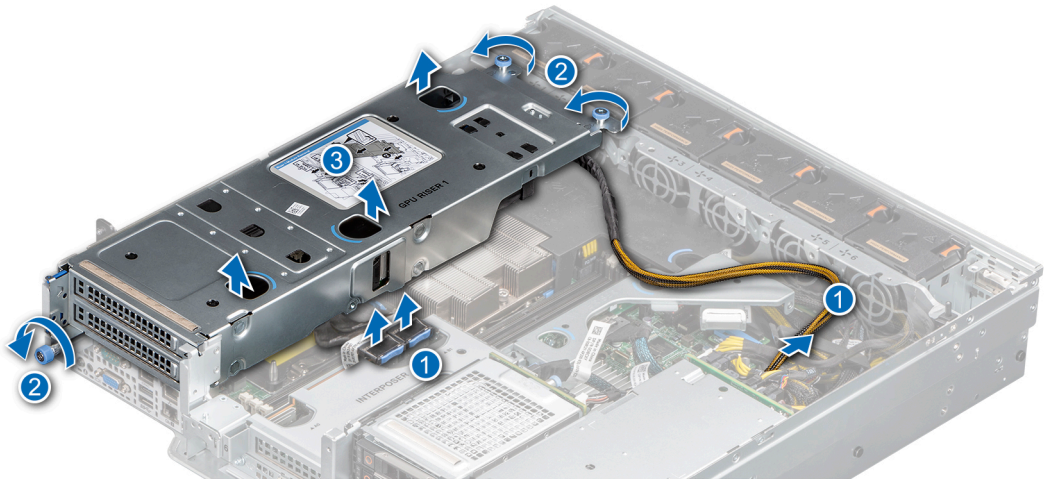


Figure 88. GPU riser 1 removal

Next steps

Replace the GPU riser 1.

Installing the GPU riser 1

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. If removed, install the GPU in the GPU riser.

Steps

1. Holding the edges or the touch points, align the holes on the expansion card riser with the guides on the chassis.
2. Lower the whole assembly into place and press the touch points until it is fully seated.
3. Tighten the one blue thumb screw located at the front of the assembly, and two blue thumb screws located at the rear or the assembly.
4. Re-connect the cables to the interposer and power interposer board.

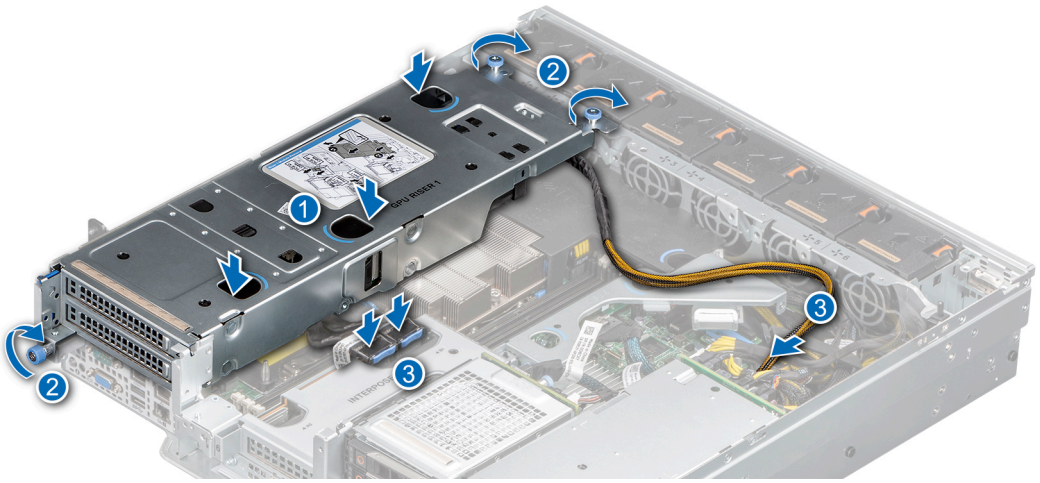


Figure 89. GPU riser 1 installation

Next steps

1. Install the GPU riser 2
2. After working inside the system

.

Removing the NVME riser

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside the system.
3. Remove the GPU riser 2

Steps

1. Disconnect the slimline cable from the riser.
2. Open the plunger.
3. Hold the blue touch points, and lift the NVME riser from the connector on the system board.

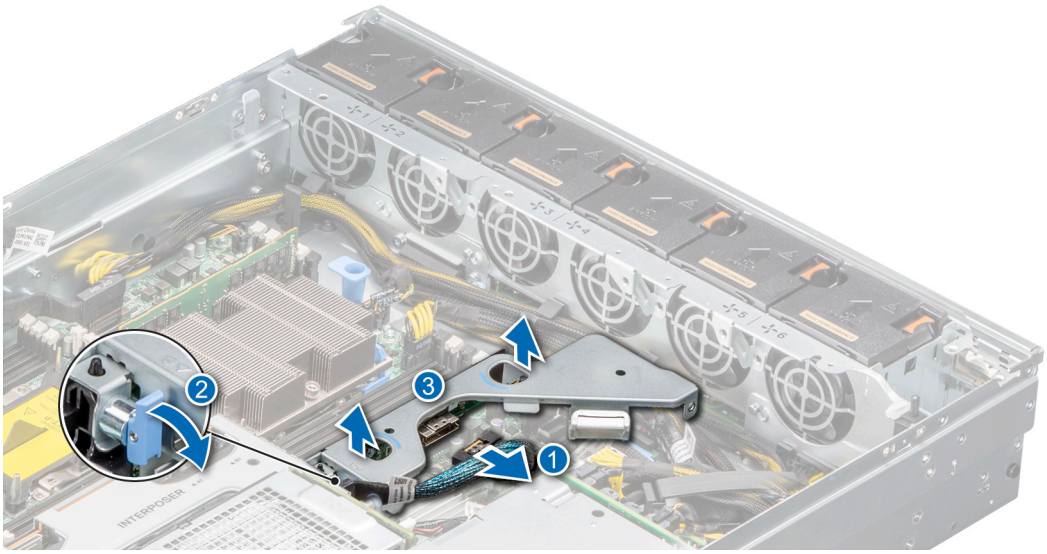


Figure 90. NVME riser removal

Next steps

Replace the NVME riser.

Installing the NVME riser

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside the system.
3. Remove the GPU riser 2.

Steps

1. Holding the blue touch points, align the slots on the NVMe riser to the guides on the system.
2. Insert the riser edge connector firmly into the system board connector until the riser is fully seated.
3. Lift the plunger to lock the riser in place.

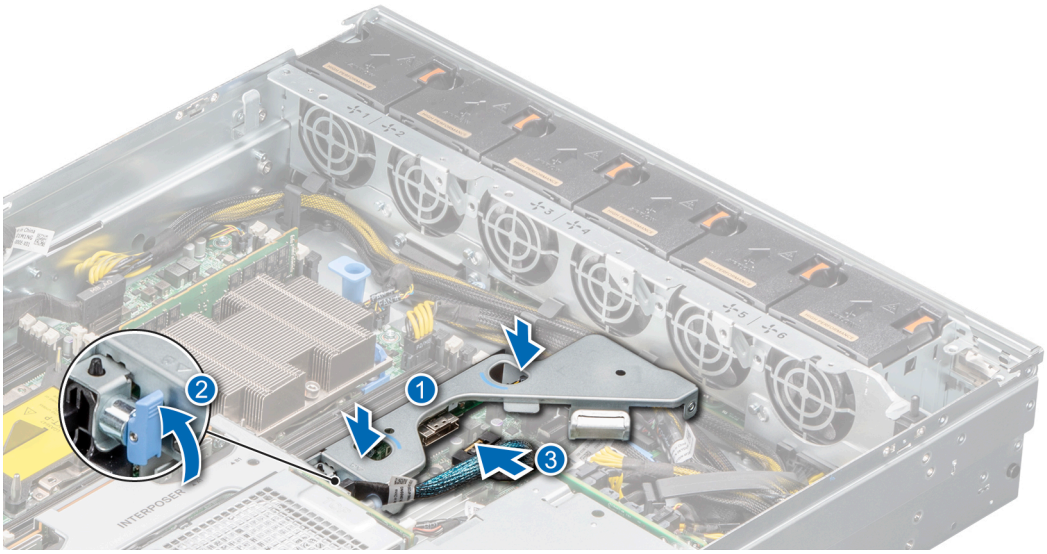


Figure 91. NVME riser installation

4. Connect the slimline cable to the riser.

Next steps

1. Install the GPU riser 2
2. After working inside the system

.

Removing the interposer

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2

Steps

1. Disconnect the interposer cables.

   NOTE: Observe the routing of the cable as you remove it from the system.

2. Hold the blue touch points, and lift the interposer from the riser.

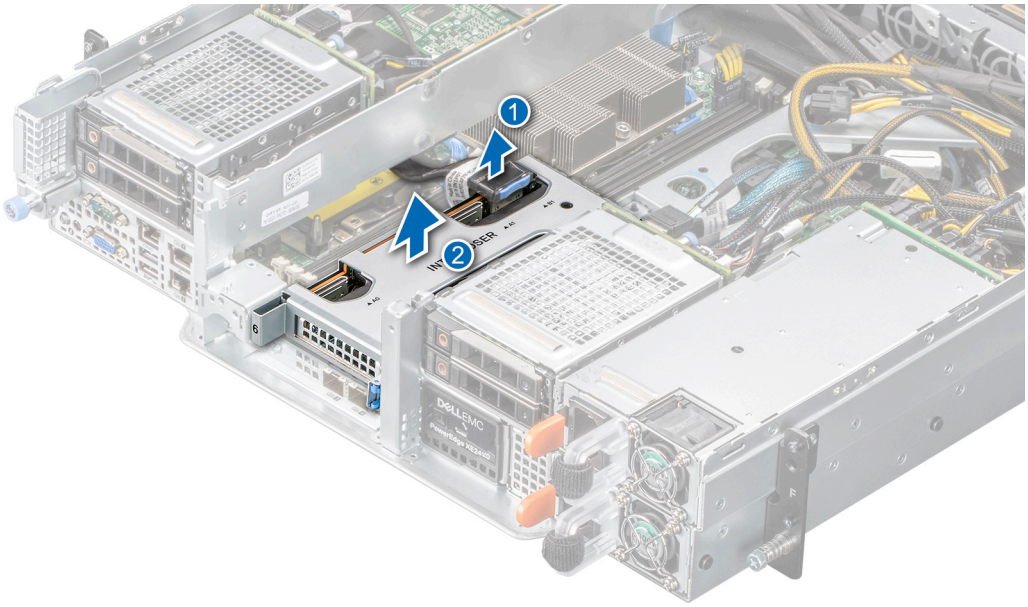


Figure 92. Interposer removal

Next steps

Replace the interposer.

Installing the interposer

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2

Steps

1. Holding the blue touch points, align the slots on the interposer to the guides on the system.
2. Insert the interposer edge connector firmly into the system board connector until the riser is fully seated.

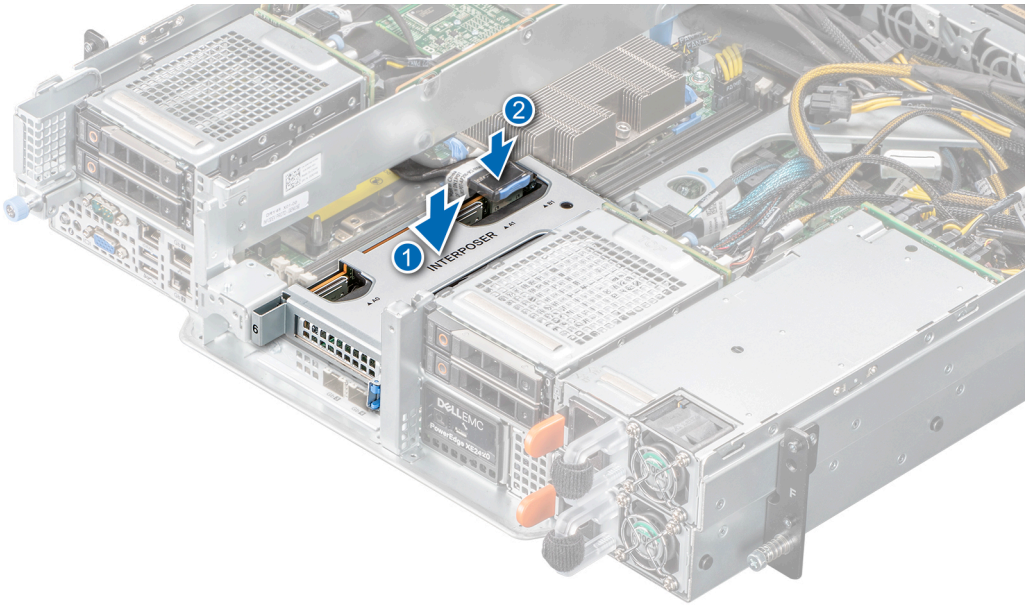


Figure 93. Interposer installation

3. Connect the interposer cables.

Next steps

1. Install the GPU riser 2
2. After working inside the system

.

Removing the expansion card from the interposer

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2
4. Disconnect all the cables connected to the interposer.
5. Remove the interposer
6. If applicable, disconnect all the cables connected to the expansion card.

Steps

1. Open the PCIe card holder latch.
2. Hold the expansion card by its edges, and pull the card until the card edge connector disengages from the expansion card connector on the interposer.

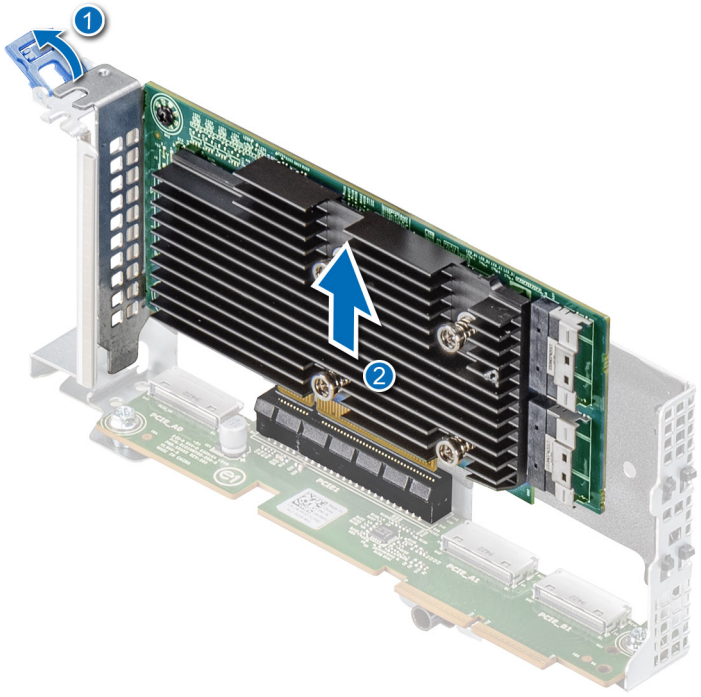


Figure 94. Expansion card removal from interposer

3. Install a filler bracket if you are not replacing the expansion card.

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 and dirt out of the system and aid in proper cooling and airflow inside the system.

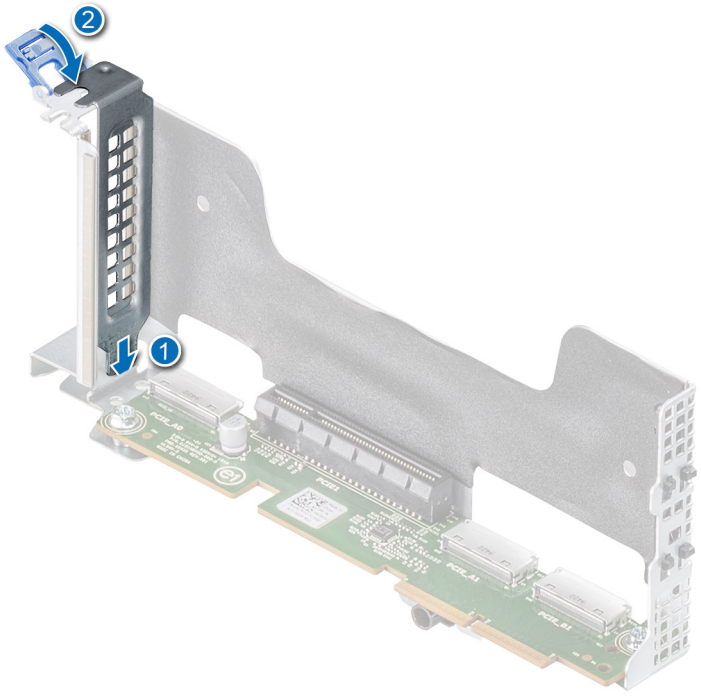


Figure 95. Filler bracket installation

Next steps

Replace the expansion card into the interposer.

Installing the expansion card into the interposer

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2.
4. Disconnect all the cables connected to the interposer.
5. Remove the interposer.
6. If applicable, disconnect all the cables connected to the expansion card.

Steps

1. Open the PCIe card holder 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.

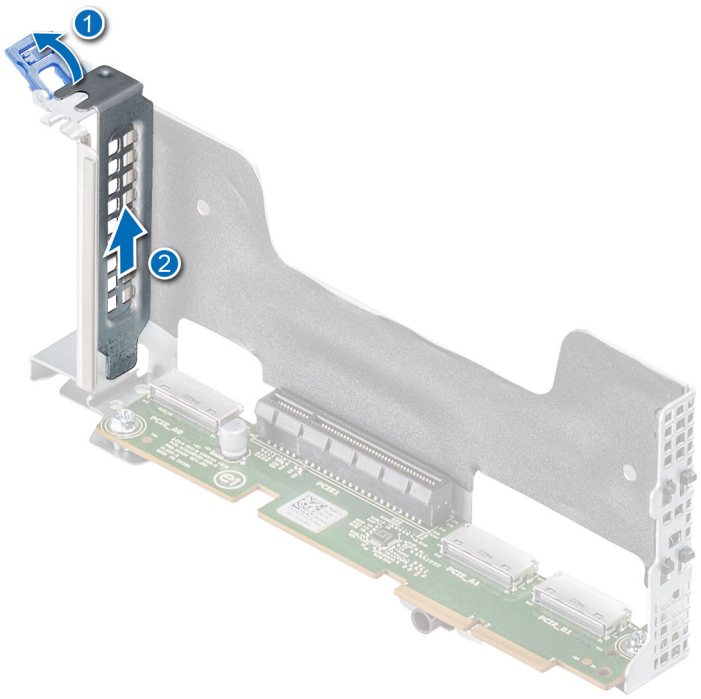


Figure 96. Filler bracket removal

3. Hold the card by its edges, and align the card edge connector with the expansion card connector on the interposer.

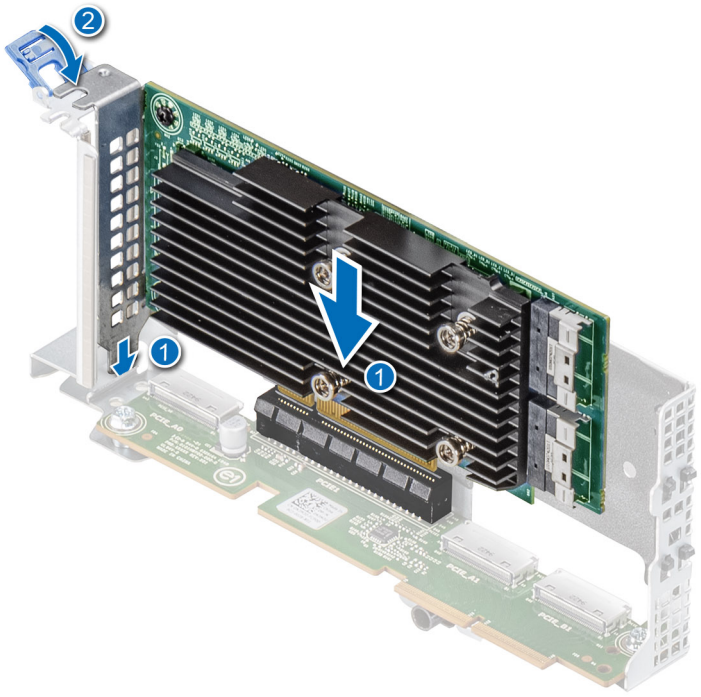


Figure 97. Expansion card installation into the interposer

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

Next steps

1. If applicable, connect all the cables to the expansion card.
2. Install the interposer
3. Connect all the interposer cables.
4. Install the GPU riser 2
5. After working inside the system

.

Processor and heat sink

Removing a processor and heat sink module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions on page 53.
2. Follow the procedure listed in the Before working inside your system on page 54.
3. Remove the air shroud.

NOTE: The heat sink and processor are too hot to touch for some time after the system has been powered down. Allow the heat sink and processor to cool down before handling them.

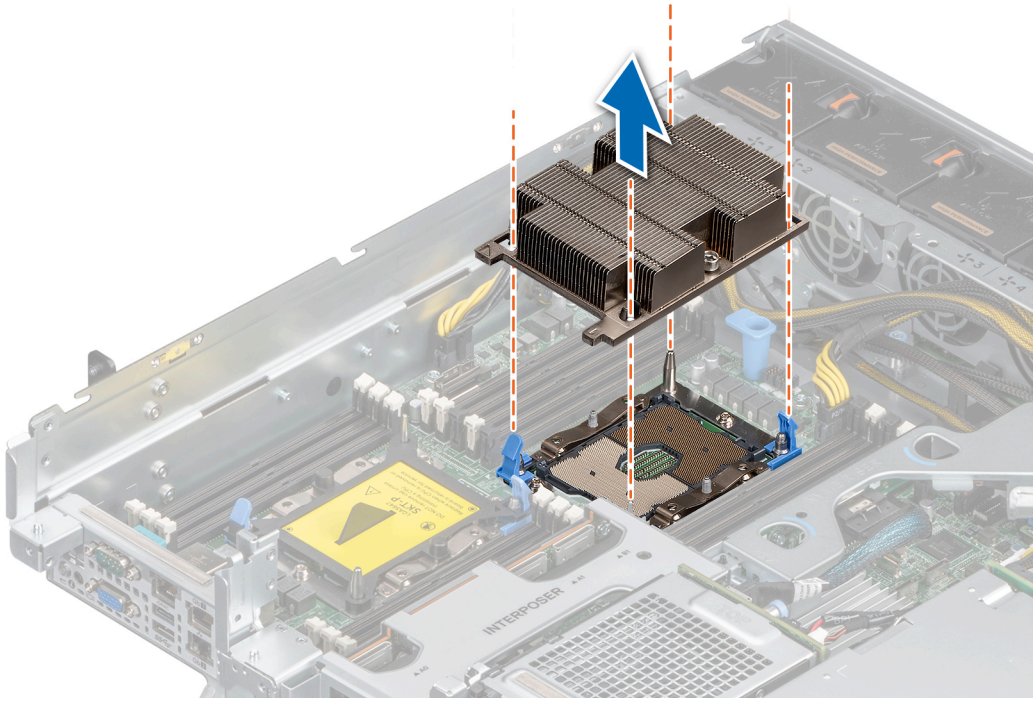
Steps

1. Using a Torx #T30 screwdriver, loosen the captive screws in the order mentioned on the heat sink:
   a. Loosen the first screw three turns.
   b. Loosen the second screw completely.
   c. Return to the first screw and loosen it completely.

NOTE: It is normal for the heat sink to slip off the blue retention clips when the screws are partially loosened, continue to loosen the screw(s).

2. Lift the heat sink from the system.

Figure 98. Removing a heat sink



Next steps

If you are removing a faulty heat sink, replace the heat sink, if not, remove the processor.

Removing the processor from the processor and heat sink module

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. Follow the procedure listed in Before working inside your system.
3. Remove the 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 paste seal.
3. Push the retaining clips on the processor bracket to unlock the bracket from the heat sink.

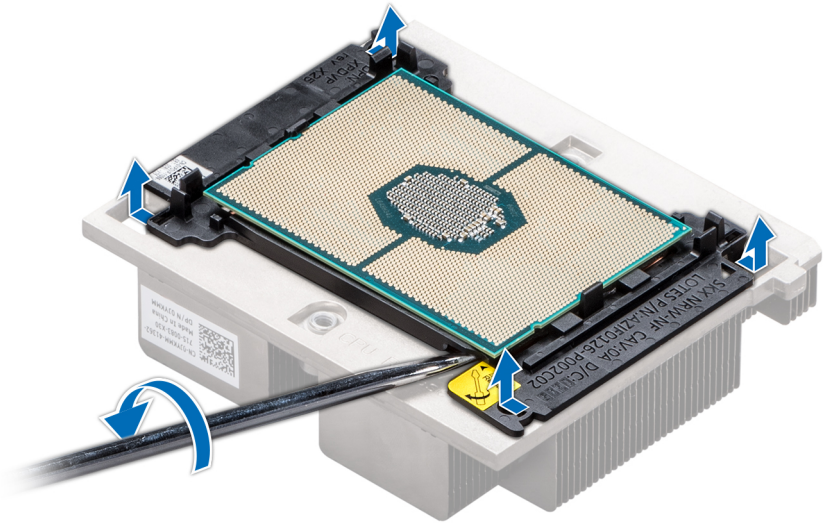


Figure 99. Loosening the processor bracket

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

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

Figure 100. Removing the processor bracket

Next steps

Install the processor into a processor and heat sink module.

Installing the processor into a processor and heat sink module

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Place the processor in the processor tray.

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

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 101. 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.

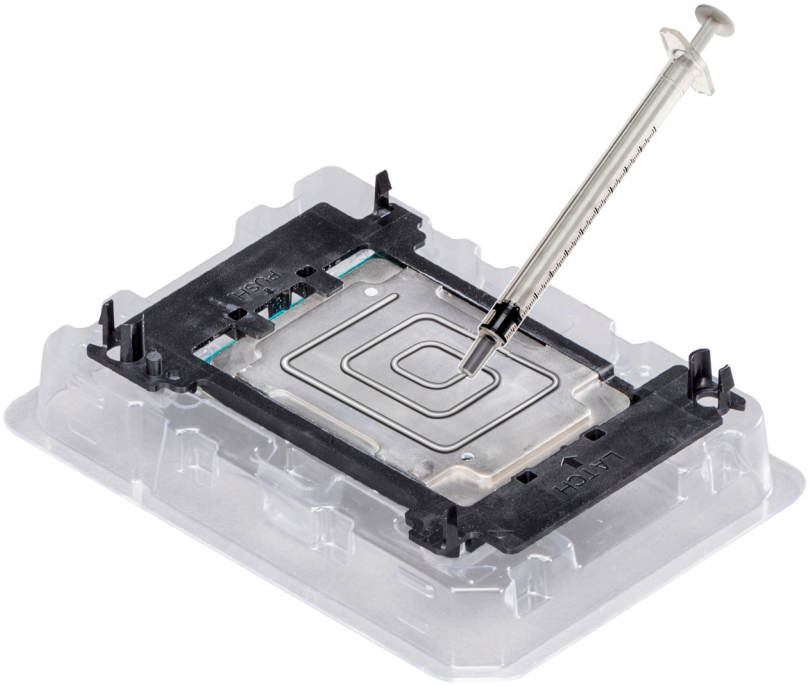


Figure 102. Applying thermal grease on top of the processor

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 and bracket.

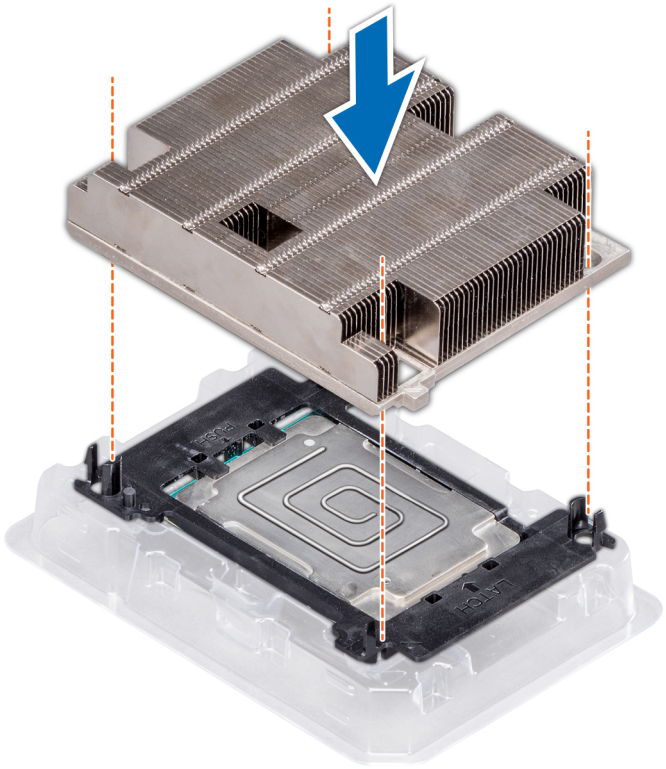


Figure 103. Installing the heat sink onto the processor

Next steps

Install the processor and heat sink module.

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.

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

1. Follow the safety guidelines listed in Safety instructions.
2. If installed, remove the processor blank and CPU dust cover.

   The procedure to remove the processor/DIMM blank is similar to that of the memory module.

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 drop 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 this step above. 4.

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

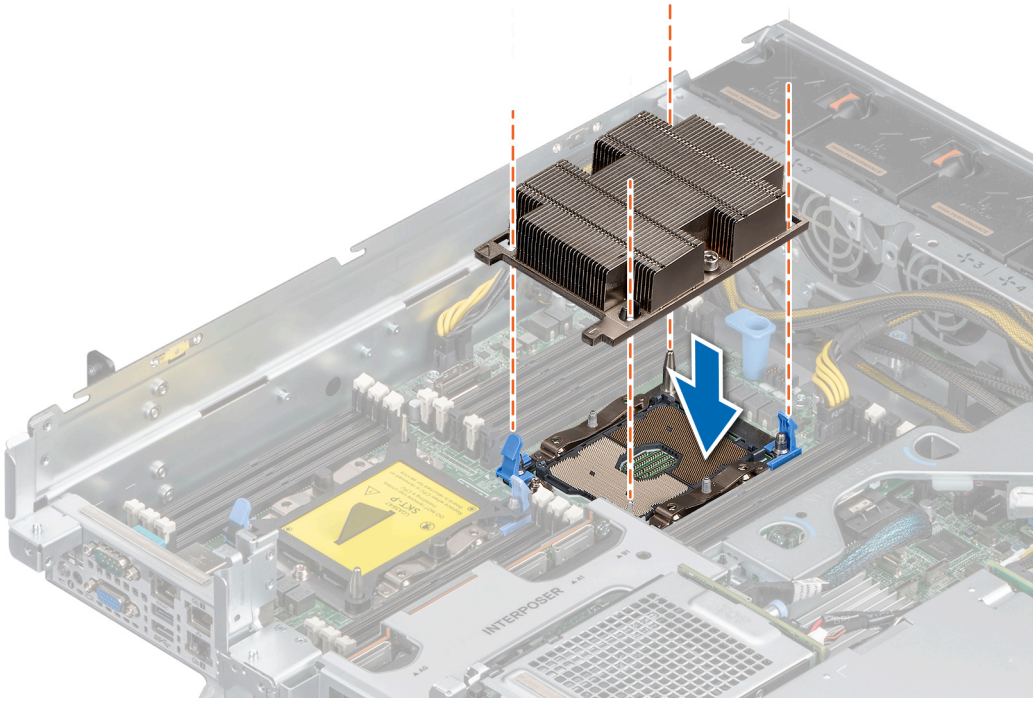


Figure 104. Installing a processor and heat sink module (1U)

Next steps

1. If applicable, install the air shroud.
2. Follow the procedure listed in After working inside your system.

Optional IDSDM module

Removing the IDSDM module

Prerequisites

1. Follow the safety guidelines listed in the Safety instaructions.
2. Follow the procedure listed in the Before working inside your system.
3. If you are replacing the IDSDM card, remove the MicroSD cards.

NOTE: Temporarily label each SD card with its corresponding slot number before removal. Reinstall the SD cards into the corresponding slots.

Steps

1. Locate the IDSDM/vFlash connector on the system board. To locate IDSDM/vFlash connector, see the System board jumpers and connectors section.
2. Holding the pull tab, lift the IDSDM card out of the system.

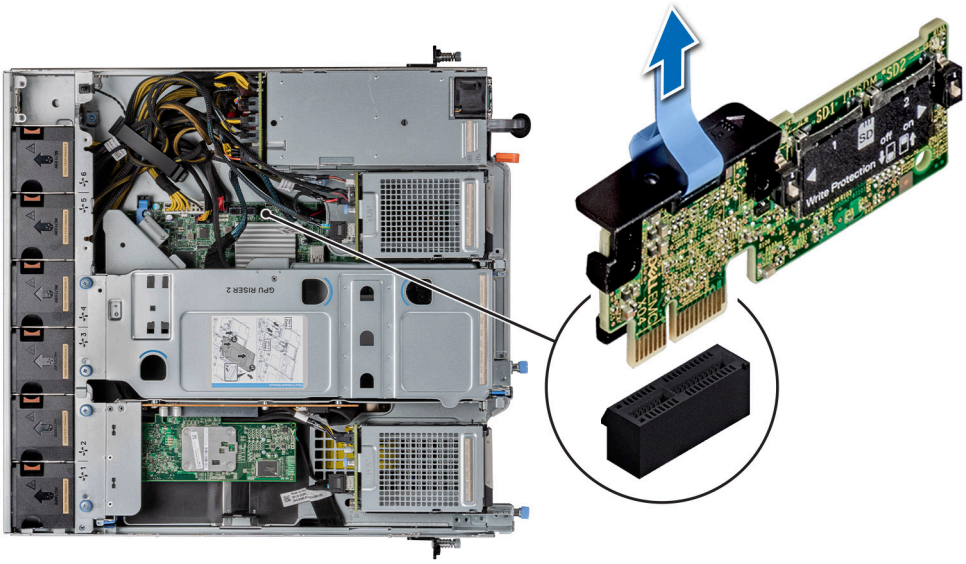


Figure 105. Removing the IDSDM module

Next steps

Replace the IDSDM module.

Installing the IDSDM module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions..
2. Follow the procedure listed in the Before working inside your system.

Steps

1. Locate the IDSDM connector on the system board.
   To locate IDSDM, see the System board jumpers and connectors section.
2. Align IDSDM module with the connector on the system board.
3. Push IDSDM module until it is firmly seated in the connector on the system board.

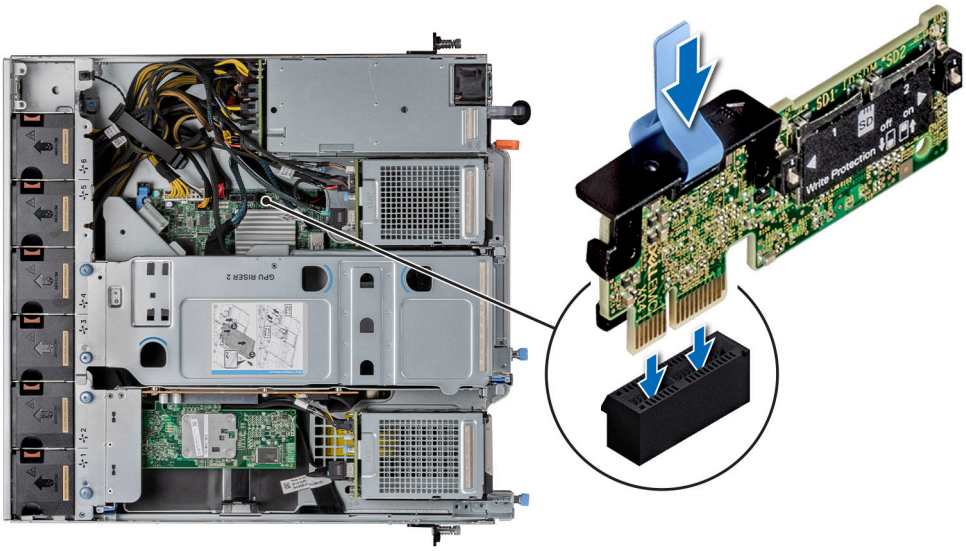


Figure 106. Installing the IDSDM module

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. Follow the procedure listed in the After working inside your system on page 54.

Micro SD card

Removing the MicroSD card

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions on page 53.
2. Follow the procedure listed in the Before working inside your system on page 54.
3. Remove the IDSDM module.

Steps

1. Locate the MicroSD card slot on the IDSDM module, and press the card to partially release it from the slot. For more information on the slot location, see System board jumpers and connectors section.
2. Hold the MicroSD card and remove it from the slot..

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

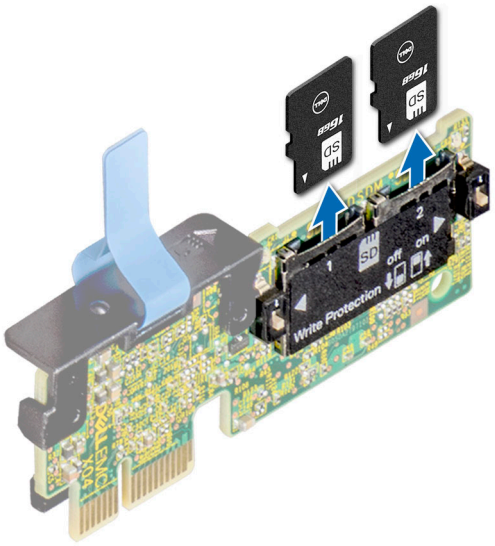


Figure 107. Removing the MicroSD card

Next steps

Install the MicroSD cards.

Installing the MicroSD card

Prerequisites

1. Follow the safety guidelines listed in the safety instructions
2. Follow the procedure listed in before working inside the system.

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

NOTE: 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 slot on the IDSDM module. Orient the MicroSD card appropriately and insert the contact-pin end of the card into the slot. To locate IDSDM, see the System board jumpers and connectors section.

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

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

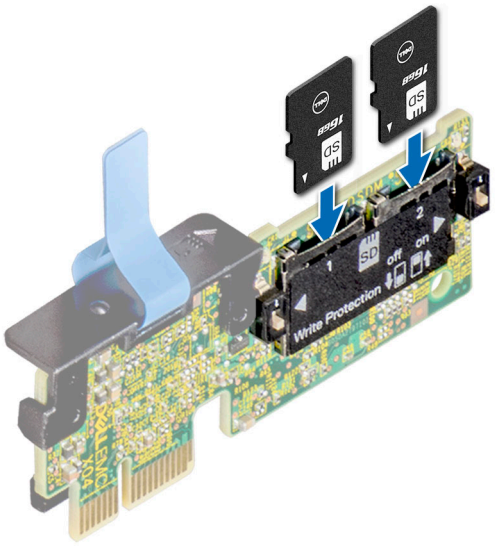


Figure 108. Installing the MicroSD card

Next steps

1. Install the IDSDM module.
2. Follow the procedure listed in the after working inside the system.

BOSS riser and M.2 module

Removing the BOSS riser

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the primary drive bay assembly.

Steps

Hold the BOSS riser by its edges, and pull the riser until the riser edge connector disengages from the expansion card connector on the system board.

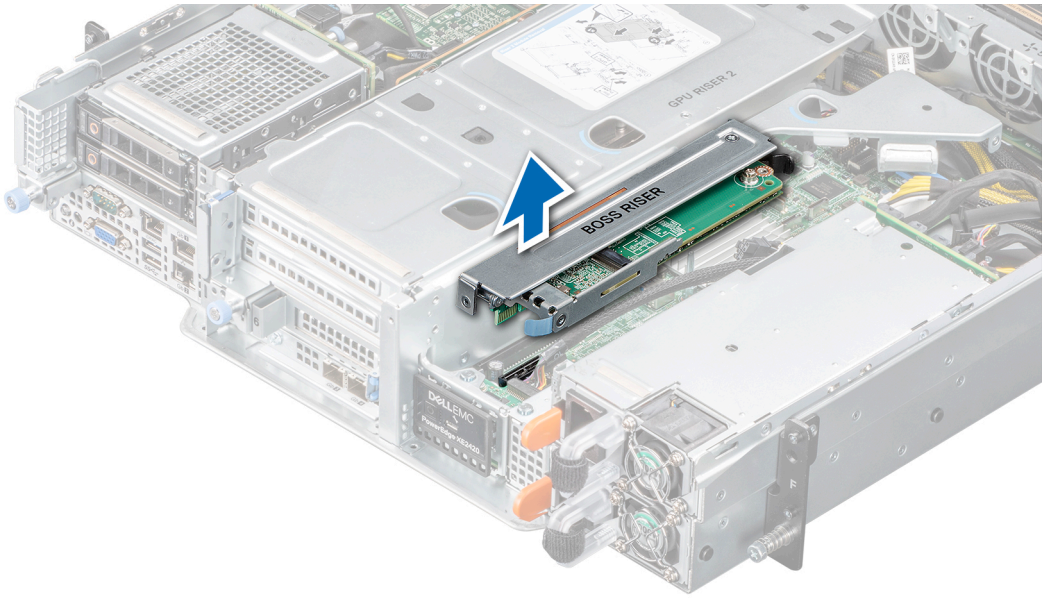


Figure 109. BOSS riser removal

Next steps

Replace the BOSS riser.

Installing the BOSS riser

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the primary drive bay assembly.

Steps

1. Hold the edges of the BOSS riser, and align the slots on the BOSS riser to the guide pin on the system.
2. Insert the riser edge connector firmly into the system board connector until the riser is fully seated.

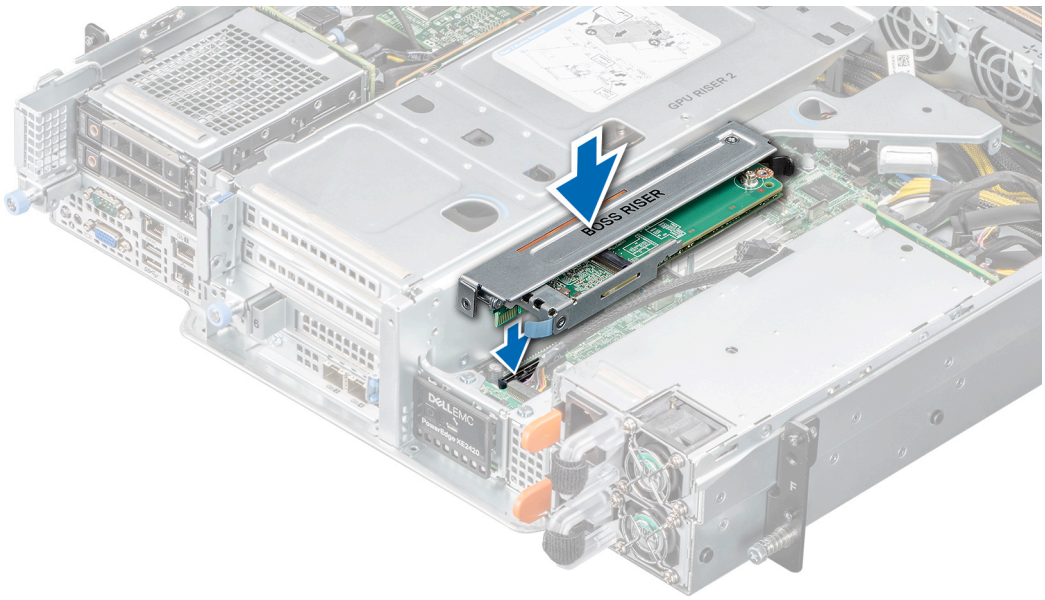


Figure 110. BOSS riser installation

Next steps

1. Install the primary drive bay assembly.
2. Follow the procedure listed in the After working inside your system.

Removing the BOSS card from the BOSS riser

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the primary drive bay assembly.
4. Remove the BOSS riser.

Steps

1. Using the Phillips #1 screwdriver, remove the screws securing the BOSS card to the BOSS card riser.
2. Pull the latch away from the BOSS card to release the BOSS card.
3. Hold the BOSS card by its edges, and pull the card until the card edge connector disengages connector on the riser.

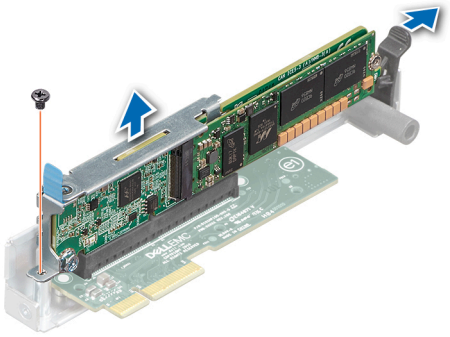


Figure 111. BOSS card removal from BOSS riser

Next steps

Replace the BOSS card into the BOSS riser.

Installing the BOSS card into the BOSS riser

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the primary drive bay assembly.
4. Remove the BOSS riser.

Steps

1. Pull the latch away from BOSS card connector.
2. Hold the edge of the BOSS card, and Align the BOSS card with the latch.
3. Insert the BOSS card edge connector firmly into the riser connector until the card is fully seated.
4. Using the Phillips #1 screwdriver, secure the BOSS card on the BOSS riser with the screw.

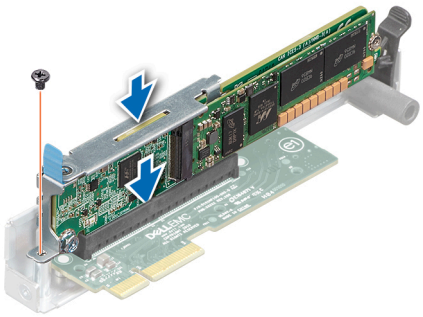


Figure 112. Boss card installation into the BOSS riser

Next steps

1. Install the BOSS riser.
2. Install the primary drive bay assembly.
3. Follow the procedure listed in the After working inside your system.

Removing the M.2 SSD module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the primary drive bay assembly.
4. Remove the BOSS riser.
5. Remove the BOSS card from the BOSS riser.

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 to disconnect from the connector on the BOSS card.

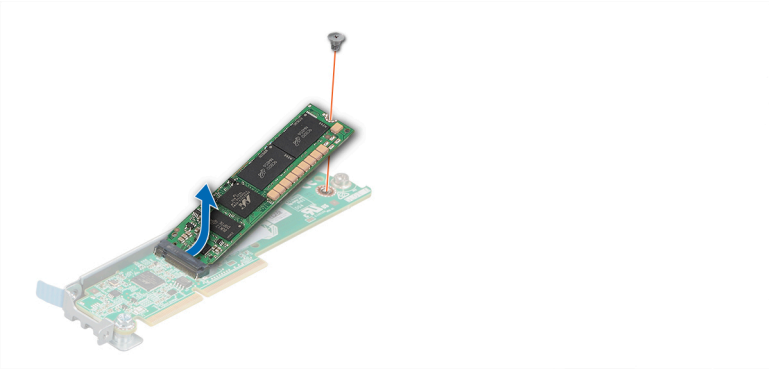


Figure 113. M.2 SSD module removal from BOSS card

Next steps

Replace the M.2 SSD module.

Installing the M.2 SSD module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the primary drive bay assembly.
4. Remove the BOSS riser.
5. Remove the BOSS card from the BOSS riser.

Steps

1. Align the M.2 SSD module at an angle with the connector on the BOSS card.
2. Insert the M.2 SSD module until it is firmly seated in the BOSS card connector.
3. Using the Phillips #1 screwdriver, secure the M.2 SSD module on the BOSS card with the screw.

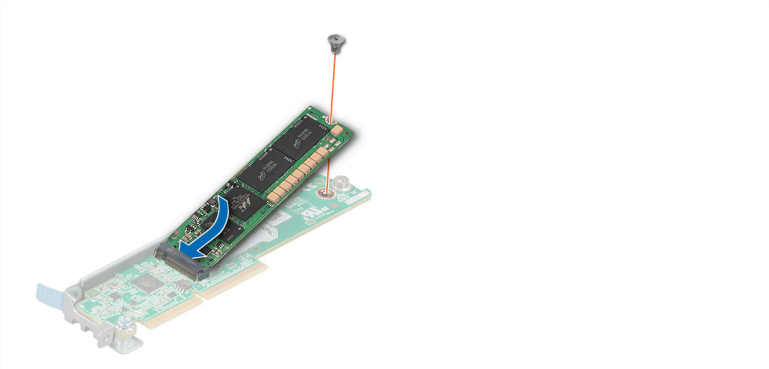


Figure 114. M.2 SSD module installation into BOSS card

Next steps

1. Install the BOSS card into the BOSS riser.
2. Install the BOSS riser.
3. Install the primary drive bay assembly.
4. Follow the procedure listed in the After working inside your system.

Network daughter card

Removing the network daughter card

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. If applicable, disconnect the cables connected to the GPU risers.
4. Remove the GPU riser 2.
5. Remove the interposer riser.

Steps

1. Using a Phillips #2 screwdriver, remove the screws that secure the network daughter card to the system board.
2. Push apart the two blue plastic snaps securing the network daughter card, to release the card.
3. Holding the network daughter card by the edges, lift to disconnect the card from the connector on the system board.
4. Slide the network daughter card towards the rear of the system until the Ethernet connectors or the SFP+ are clear of the slot in the front panel.

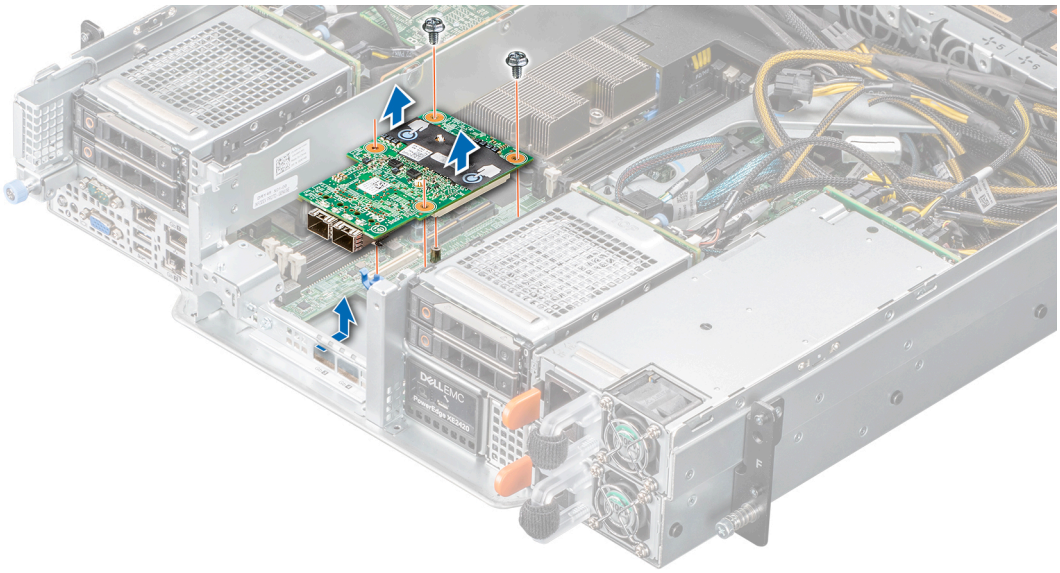


Figure 115. Removing the network daughter card

5. Lift the card out of the system.
6. If the network card is not being replaced immediately, install the filler bracket.
   a. Insert and slide the filler into the slot on the chassis.
   b. Using the Phillips #2 screwdriver, secure the filler bracket to the chassis with a screw.
7. If the LOM riser is not being replaced immediately, install the LOM filler bracket.
   a. Insert and slide the filler into the slot on the chassis.
   b. Using the Phillips #2 screwdriver, secure the filler bracket to the chassis with the screw.

Next steps

Replace the network daughter card.

Installing the network daughter card

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. If applicable, disconnect the cables connected to the GPU risers.
4. Remove the GPU riser 2.
5. Remove the interposer.

Steps

1. Remove the LOM filler bracket.
   a. Using the Phillips #2 screwdriver, remove the screw that secures the bracket to the system.
   b. Slide the bracket out of the slot on the system.
2. Install the LOM bracket.
   a. Insert and slide the LOM bracket into the slot on the system.
   b. Using the Phillips #2 screwdriver, secure the bracket to the system with a screw
3. Orient the network daughter card to fit the Ethernet connectors or the SFP+ through the slot of the bracket.

   NOTE: NIC port 1 in network daughter card is Gb3, and NIC port 2 is Gb4.

4. Press the network daughter card until the card is firmly seated on the system board connector and the two blue plastic clips to secure the card in place.
5. Using a Phillips #2 screwdriver, secure the network daughter card to the system board with screws.

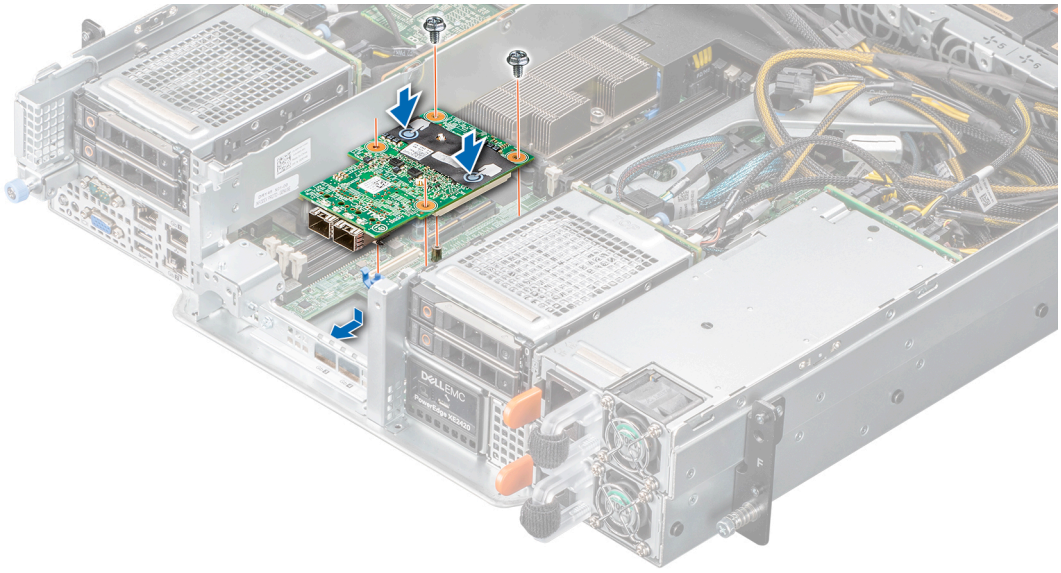


Figure 116. Installing the network daughter card

Next steps

1. Install the interposer.
2. Install the GPU riser 2.
3. If applicable, connect the cables connected to the GPU risers.
4. Follow the procedure listed in After working inside your system.

NOTE: While replacing faulty storage controller/FC/NIC card with the same type of card, after you power on the system; the new card automatically updates to the same firmware and configuration of the faulty one. For more information about the Part replacement configuration, see the *Lifecycle Controller User's Guide* at www.dell.com/idracmanuals

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. Discard used batteries according to the manufacturer's instructions. See the Safety instructions. that came with your system for more information..

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the GPU riser 2.
4. If applicable, disconnect the cables connected to the GPU.
5. Remove the interposer.
6. If applicable, disconnect the cables connected to the expansion card on the interposer.

Steps

1. Locate the battery socket. For more information, see the System board jumpers and connectors section.

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

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

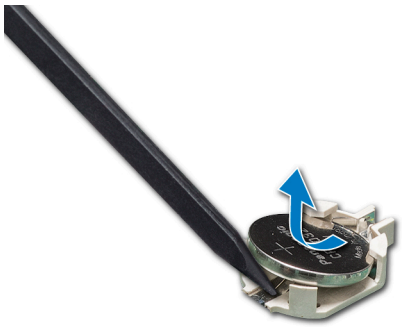


Figure 117. System battery removal

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

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

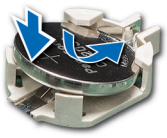


Figure 118. System battery installation

Next steps

1. If applicable, connect the cables to the expansion card on the interposer.
2. Install the interposer
3. Install the GPU riser 2
4. If applicable, connect the cables to the GPU.
5. Follow the procedure listed in the After working inside your system.
6. Confirm that the battery is operating properly, by performing the following steps:
   a. Enter the System Setup, while booting, by pressing F2.
   b. Enter the correct time and date in the System Setup **Time** and **Date** fields.
   c. **Exit** the System Setup.
   d. To test the newly installed battery, remove the system from the enclosure for at least an hour.
   e. Reinstall the system into the enclosure after an hour.
   f. Enter the System Setup and if the time and date are still incorrect, see Getting help section.

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 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 the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the interposer.

Steps

1. Locate the USB port or USB memory key on the system board.
   To locate the internal USB port on the system board, see the System board jumpers and connectors section.
2. If installed, remove the USB memory key from the USB port.
3. Insert the replacement USB memory key into the USB port.

Next steps

1. Install the interposer.
2. Follow the procedure listed in After working inside your system.
3. While booting, press F2 to enter **System Setup** and verify that the system detects the USB memory key.

Power interposer board

Power interposer board

The power interposer board (PIB) is a board that connects the hot swappable power supply units (PSUs) to the system board. The PIB is only supported in systems with redundant PSUs.

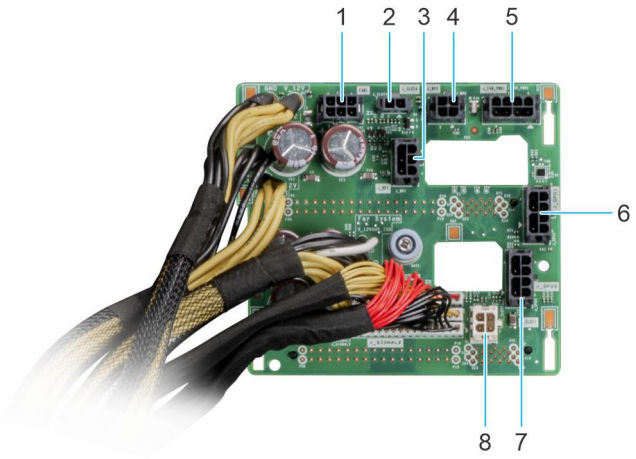


Figure 119. Power interposer board

1. FAN_SIG (PIB to cooling fans board)
2. SLOT4_PWR (PIB to system board)
3. BP1_PWR (PIB to primary backplane)
4. BP2_PWR (PIB to Second backplane)
5. FAN_PWR (PIB to cooling fan board)
6. GPU1_PWR (PIB to GPU 1)
7. GPU2_PWR (PIB to GPU 2)
8. SLOT1_PWR (PIB to system board)

Removing the power interposer board

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the power supply units.
4. Remove all the cables connected to the power interposer board.

NOTE: Observe the routing of the cable as you remove it from the power interposer board.

Steps

1. Pull the plunger to disengage the power interposer board from the lock hole on the PSU cage.
2. Lift the power interposer board out of the chassis.

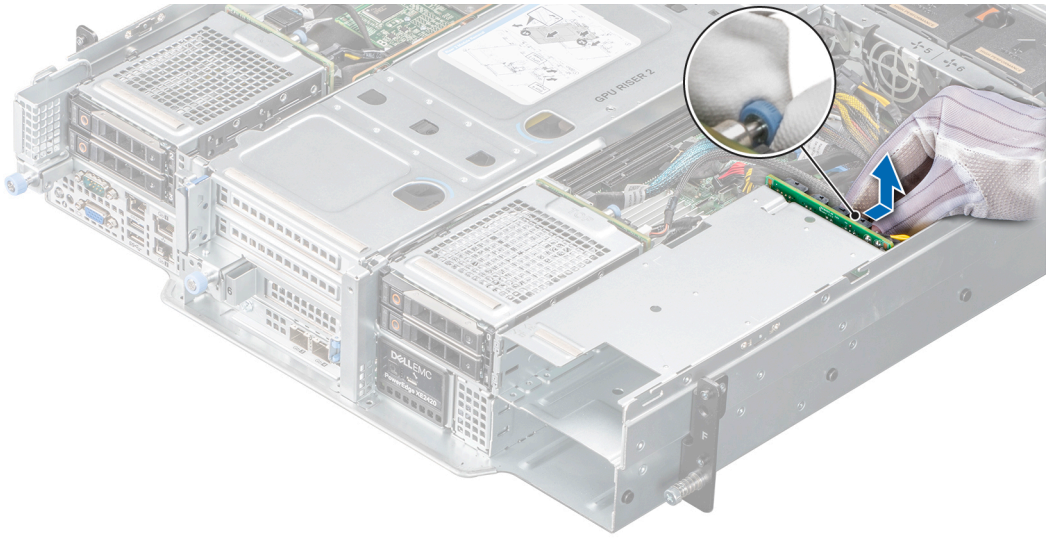


Figure 120. Power interposer removal

Next steps

Replace the power interposer board.

Installing the power interposer board

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.

Steps

Insert the power interposer board into the guides and then lower it until the plunger click into place.

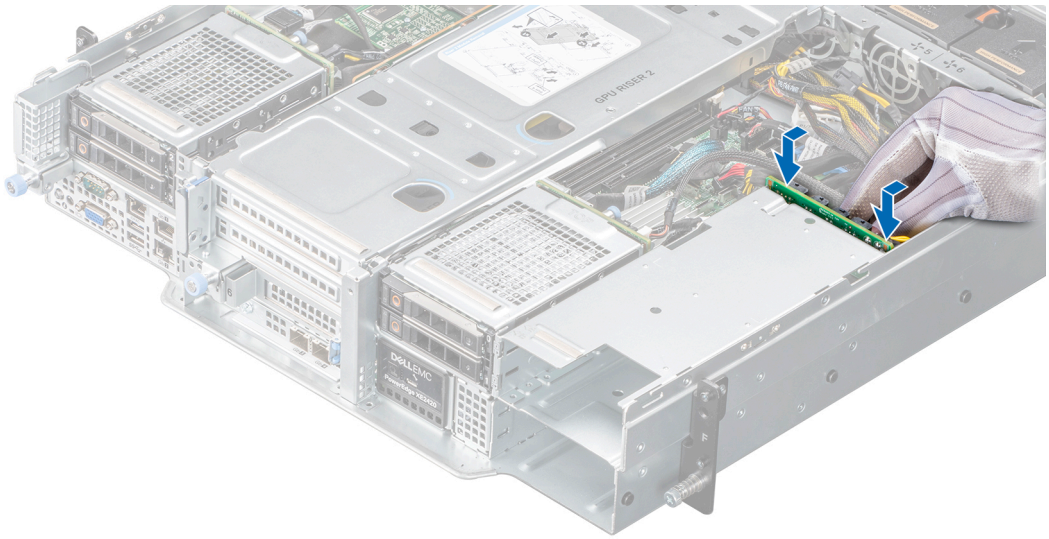


Figure 121. Power interposer board installation

Next steps

1. Install the PSU.
2. Reconnect all the cable that were removed.
3. 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.

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the following components:
   a. Primary drive bay assembly

b. Control panel assembly
c. GPU riser 2
d. GPU riser 1 or Second drive bay assembly
e. Interposer
f. LOM riser card
g. NVME riser
h. IDSDM module
i. Air shroud
j. Internal USB key (if installed)
k. Memory modules
l. Heat sink
m. Processor
n. TPM
o. Disconnect all cables from the system board.

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

Steps

1. Using a Phillips #2 screwdriver, remove the screws securing the system board to the chassis.

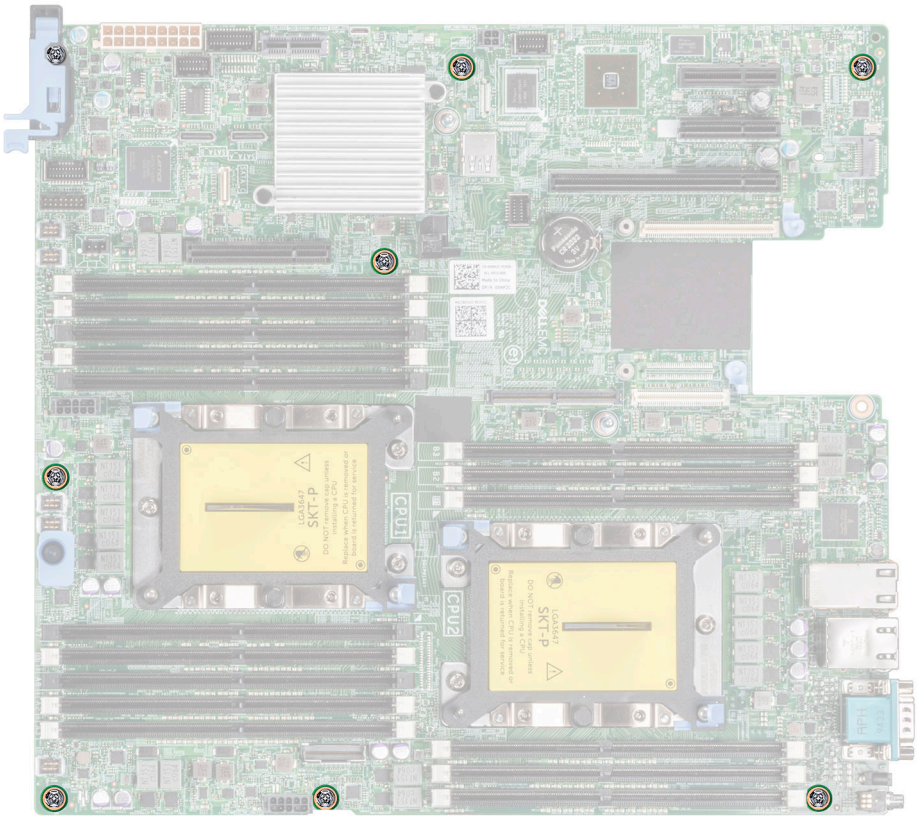


Figure 122. System board diagram with screws

2. Using the system board holder, slightly lift the system board, and then slide it toward the rear of the chassis.
3. Lift the system board out of the chassis.

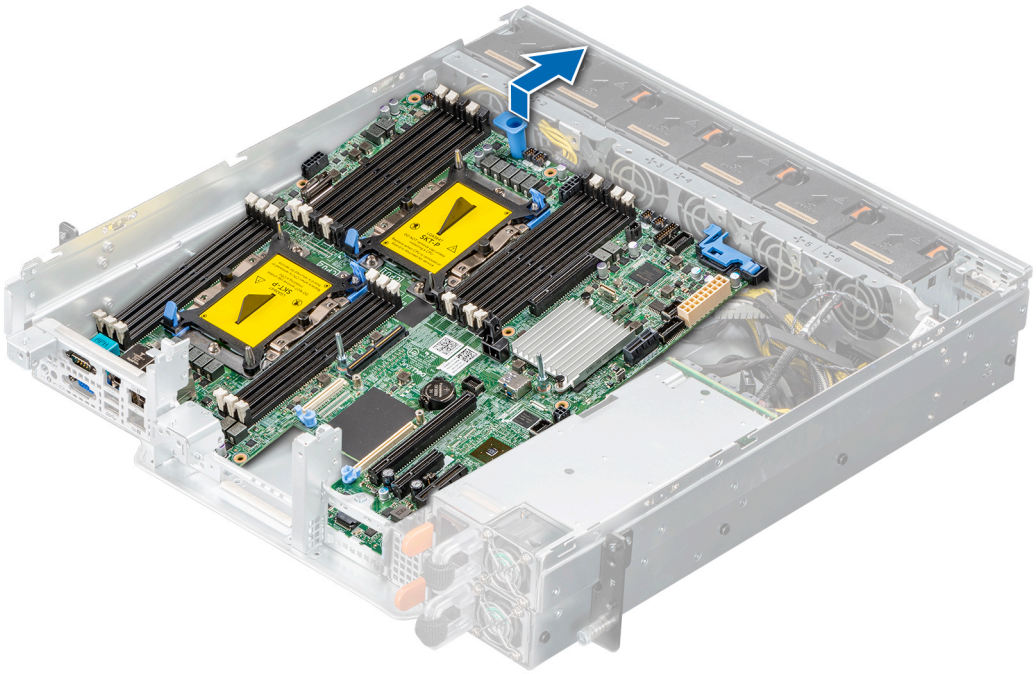


Figure 123. System board removal

Next steps

Install the system board.

Installing the system board

Prerequisites

NOTE: Before replacing the system board, replace the old iDRAC MAC address label in the Information tag with the iDRAC MAC address label of the replacement system board

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. If you are replacing the system board, remove all the components that are listed in the removing the system board section.

Steps

1. Unpack the new system board assembly.

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

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

2. Holding the system board holder, lower the system board it into the system.
3. Incline the system board at an angle and align the connectors with the slots on the front of the chassis.
4. Slide the system board towards the front of the chassis until the connectors are firmly seated in the slots.

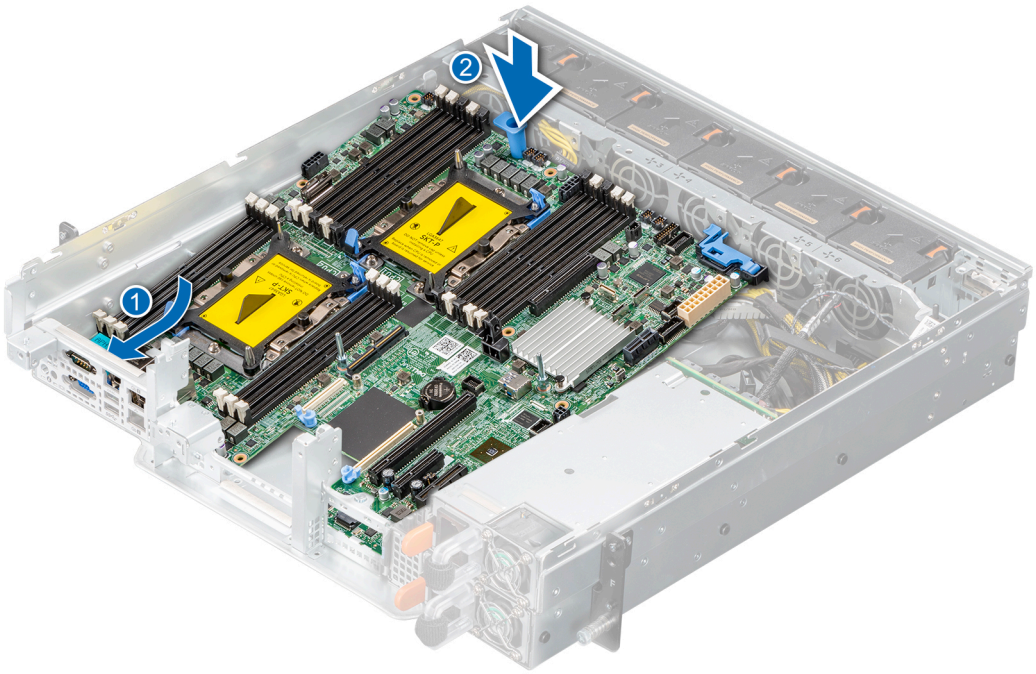


Figure 124. System board installation

5. Using a Phillips #2 screwdriver, fasten the screws that secure the system board to the chassis.

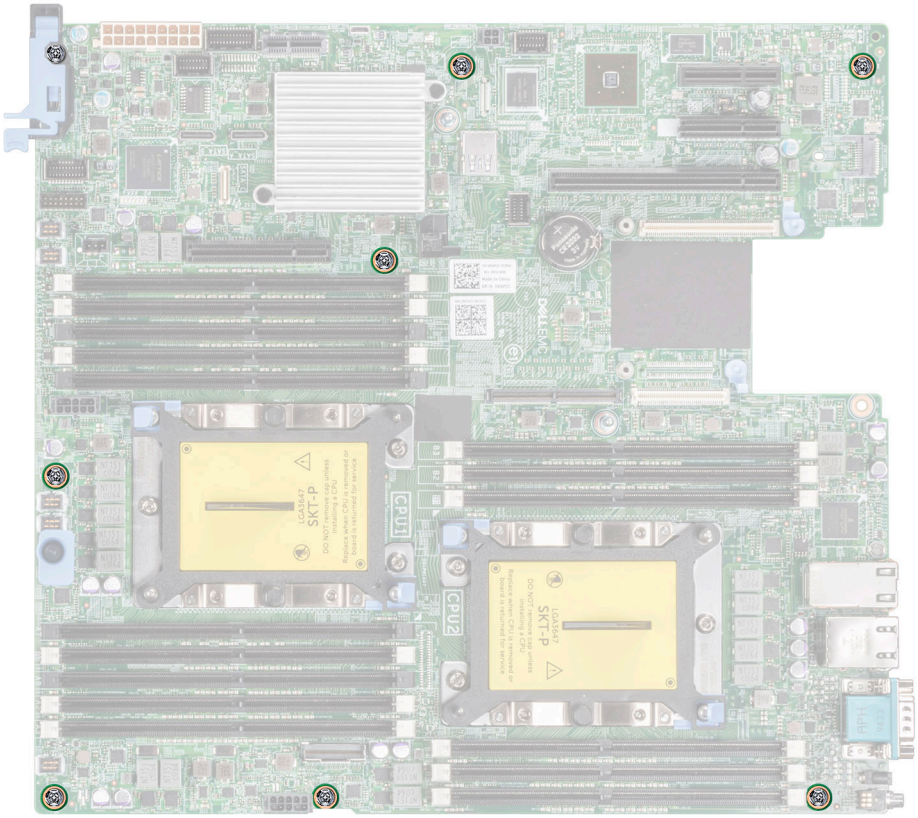


Figure 125. System board diagram with screws

Next steps

1. Replace the following components:
   a. Trusted Platform Module (TPM)
      NOTE: The TPM Module must be replaced only while installing new system board.
   b. Processor
   c. Heat sink
   d. Memory modules
   e. Internal USB key (if installed)
   f. Air shroud
   g. IDSDM module
   h. NVME riser
   i. LOM riser card
   j. Interposer
   k. GPU riser 1 or Second drive bay assembly
   l. GPU riser 2
   m. Control panel assembly
   n. Primary drive bay assembly
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. Ensure that you perform the following steps:
   a. Use the Easy Restore feature to restore the Service Tag. See the Restoring the system by using the Easy Restore feature section.
   b. If the service tag is not backed up in the backup flash device, enter the system service tag manually. See the Manually update the Service Tag by using System Setup section.
   c. Update the BIOS and iDRAC versions.

      Re-enable the Trusted Platform Module (TPM). See the Upgrading the Trusted Platform Modulesection.
4. If you are not using Easy restore, import your new or existing iDRAC Enterprise license. For more information, see the *iDRAC User's Guide* available at www.dell.com/idracmanuals .
5. Follow the procedure listed in After working inside your system.

Restoring Service Tag using Easy Restore

The Easy Restore feature allows you to restore your Service Tag, iDRAC license, UEFI configuration, and the system configuration data after replacing the system board. All data is backed up in a backup Flash drive device automatically. If BIOS detects a new system board, and the Service Tag in the backup Flash drive device is different, BIOS prompts the user to restore the backup information.

About this task

Below is a list of options available:

1. Restore the Service Tag, license, and diagnostics information, press **Y.**
2. Navigate to the Lifecycle Controller based restore options, press **N.**
3. 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.
4. To restore the system configuration data, press **Y**
5. To use the default configuration settings, press **N**
   NOTE: After the restore process is complete, system reboots.

NOTE: If restoring the Service Tag is successful, you can check the Service Tag information in the **System Information** screen and compare it with the Service Tag on the system.

Manually updating 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. Turn 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. After the Service Tag is entered, it cannot be updated or changed.

5. Click **OK**.

Trusted Platform Module

Upgrading the Trusted Platform Module

Prerequisites

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. If required, remove the control panel assembly to have access to TPM port on system board.
2. Locate the TPM connector on the system board.
3. Press to hold the module down and remove the screw using the security Torx 8-bit shipped with the TPM module.
4. Slide the TPM module out from its connector.
5. Push the plastic rivet away from the TPM connector and rotate it 90° counterclockwise to release it from the system board.
6. 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.
4. Replace the screw that secures the TPM to the system board.

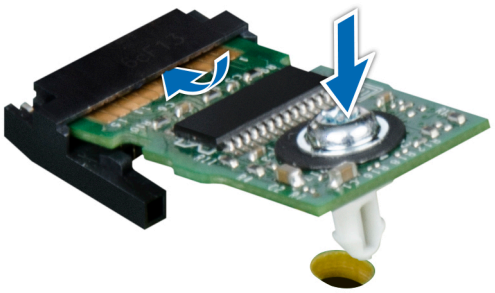


Figure 126. Installing the TPM

5. If removed, install the control panel assembly.

Initializing TPM for users

Steps

1. Initialize the TPM.
   For more information, see Initializing the TPM for users.
2. The **TPM Status** changes to **Enabled, Activated**.

Initializing the TPM 1.2 for 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 Preboot Measurements**.
4. From the **TPM Command** option, select **Activate**.
5. Save the settings.
6. Restart your system.

Initializing the TPM 2.0 for 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

Jumpers and connectors

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

Topics:

System board connectors

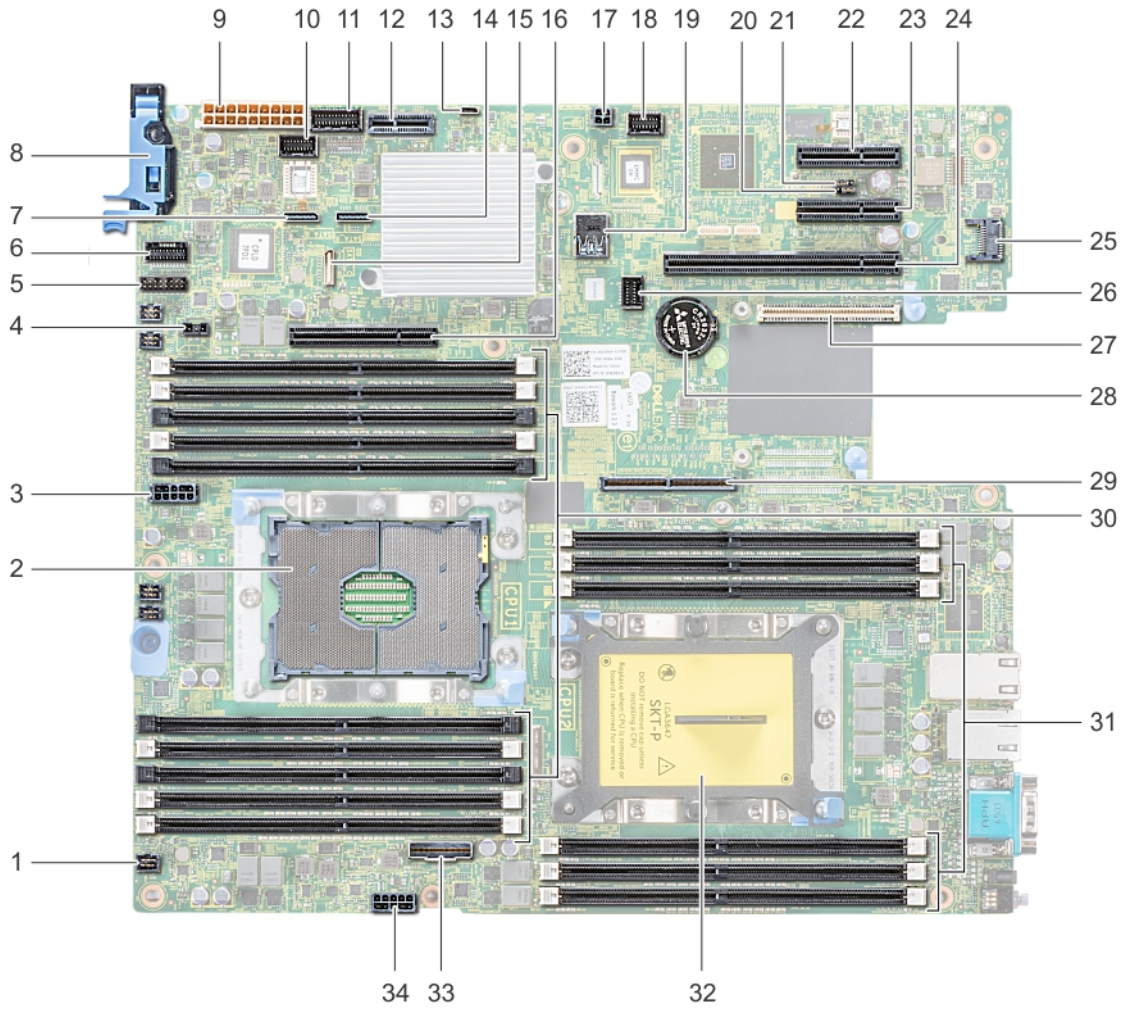


Figure 127. System board jumpers and connectors

Table 48. System board connectors and their description

Item	Connector	Description
1.	FAN6	Cooling fan 6 connector
2.	CPU1	Processor socket 1
3.	CPU1_PWR_CONN(P2)	CPU1 power connector
4.	J_INTRU	Intrusion switch connector
5.	J_BP_SIG1	Backplane signal connector 1
6.	LFT_CP_CONN	Left control panel connector
7.	J_SATA_B1	Internal SATA B connector
8.	RGT_CP_CONN	Right panel connector
9.	SYS_PWR_CONN(P1)	System power connector
10.	J_PIB_SIG1	Power interposer board signal connector 1
11.	J_PIB_SIG2	Power interposer board signal connector 2
12.	J_ACE	Internal Dual SD Module
13.	J_CP_USB2	Front USB connector
14.	J_SATA_A1	Internal SATA A connector
15.	J_SATA_C1	Internal SATA C connector
16.	PCIE_G3_X8(CPU1)	NVME riser
17.	J_REAR_BP_PWR1	Rear backplane power connector
18.	J_FRONT_VIDEO	VGA 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	BOSS riser
24.	(Slot 4) PCIe_G3_x16 (CPU2)	GPU riser 2 slot
25.	J_TPM_MODULE	TPM module connector
26.	J_BP_SIG0	Backplane signal connector
27.	J_OCP_A1	Network daughter card connector
28.	BATTERY	Battery connector
29.	PCIE_G3_X16(CPU1)	Interposer connector
30.	A6, A5, A10, A4, A9, A7, A1, A8, A2, A3	Memory module sockets
31.	B3, B2, B1, B4, B5, B6	Memory module sockets
32.	CPU2	Processor socket 2
33.	PCIE_A0	NVMe connector
34.	CPU2_PWR_CONN(P3)	CPU2 power connector

System board jumper settings

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

Table 49. System board jumper settings

Jumper	Setting	Description
PWRD_EN		The BIOS password feature is enabled.
		The BIOS password feature is disabled. The BIOS password is now disabled and you are not allowed to set a new password.
NVRAM_CLR		The BIOS configuration settings are retained at system boot.
		The BIOS configuration settings are cleared at system boot.

CAUTION: Be careful when changing the BIOS settings. The BIOS interface is designed for advanced users. Any change in the setting could prevent your system from starting correctly and you might have potential loss of data.

Disabling a 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, and all the attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Move the jumper on the system board from pins 2 and 4 to pins 4 and 6.
4. Replace the system cover.

   NOTE: 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 and all the attached peripherals.
6. Power off the system.
7. Remove the system cover.
8. Move the jumper on the system board from pins 4 and 6 to pins 2 and 4.
9. Replace the system cover.
10. Reconnect the system to the electrical outlet and power on the system, and all the attached peripherals.
11. Assign a new system and/or setup password.

7

Technical specifications

The technical and environmental specifications of your system are outlined in this section.

Topics:

Chassis dimensions

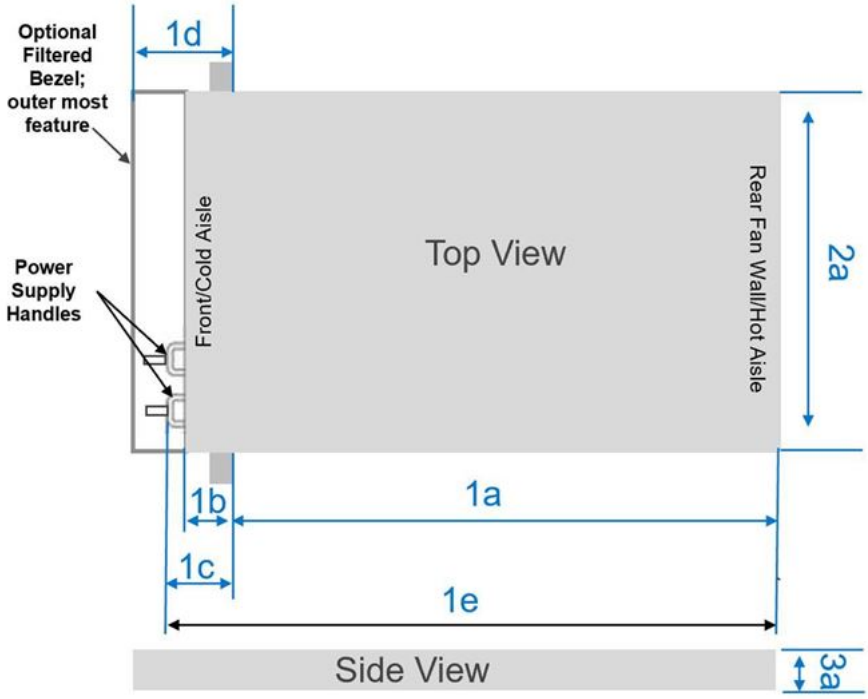


Figure 128. Chassis dimensions

Table 50. PowerEdge XE2420 chassis dimensions

System configurations	1a	1b	1c	1d	1e	2a	3a
2 x 2.5-inches or 4 x 2.5-inches	410.5 mm (16.16-inch)	73.45 mm (2.89-inch)	85.6 mm (3.37-inch)	152.15 mm 5.99-inch	496.1 mm (19.53-inch)	444 mm (17.48-inch)	86.92 mm (3.42-inch)

System weight

Table 51. PowerEdge XE2420 system weight

System configuration	Maximum weight (with all drives)
2 x 2.5-inch configuration	17.36 kg (38.19 lb)
4 x 2.5-inch configuration	16.65 kg (36.63 lb)
6 x EDSFF E1.L configuration	18.93 kg (41.65 lb)

Processor specifications

Table 52. PowerEdge XE2420 processor specifications

Supported processor	Number of processors supported
Intel® Xeon® Scalable processors with up to 24 cores per processor	Two

PSU specifications

Table 53. PowerEdge XE2420 PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage	Current
1100 W DC	N/A	4416 BTU/hr	N/A	-(48 V to 60 V DC),autoranging	32 A
2000 W AC	Platinum	7500 BTU/hr	50/60 Hz	100-240 V AC, autoranging	12 A- 10 A

NOTE: This system is also designed to connect to the IT power systems with a phase-to-phase voltage not exceeding 230 V.

NOTE: When selecting or upgrading the system configuration, to ensure optimum power utilization, verify the system power consumption with the Dell Energy Smart Solution Advisor available at **Dell.com/ESSA**.

Supported operating systems

The PowerEdge XE2420 supports the following operating systems:

- Canonical Ubuntu Server LTS
- Microsoft Windows Server with Hyper-V
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- VMware ESXi
- CentOS

For more information about the specific versions and additions, see https://www.dell.com/support/home/Drivers/SupportedOS/poweredge-xe2420.

Cooling fans specifications

The PowerEdge XE2420 system supports up to six dual rotor fans.

System battery specifications

The PowerEdge XE2420 system supports CR 2032 3.0-V lithium coin cell system battery.

Expansion card riser specifications

The PowerEdge XE2420 system supports up to two PCI express (PCIe) expansion cards:

Table 54. Expansion card slots supported on the system board

Configurations	PCIe slot	Riser	PCIe slot height	PCIe slot length	Slot width
1A	Cabled riser	Slot 1 Riser	Full-height	Half-length or Full-length	Double-wide x16 (Gen 3) or 2 Single-wide x 8(Gen 3)
2C	Cabled riser	Slot 1 Riser(PERC)	Full-height	Half-length	Single-wide x 8 (Gen 3)
3A	Cabled riser	Slot 1 Riser	Full-height	Half-length or Full-length	Double-wide x16 (Gen 3) or 2 Single-wide x 8(Gen 3)
All	Slot 4	Slot 4 Riser	Full-height	Half-length or Full-height	Double-wide x16 (Gen 3) or 2 Single-wide x 8(Gen 3)

Memory specifications

The PowerEdge XE2420 system supports the following memory specifications for optimized operation.

Table 55. Memory specifications

DIMM type	DIMM rank	DIMM capacity	Single processor		Dual processor	
			Minimum RAM	Maximum RAM	Minimum RAM	Maximum RAM
RDIMM	Single rank	8 GB	8 GB	64 GB	16 GB	128 GB
	Dual rank	16 GB	16 GB	128 GB	32 GB	256 GB
		32 GB	32 GB	256 GB	64 GB	512 GB
		64 GB	64 GB	512 GB	128 GB	1 TB
LRDIMM	Quad rank	64 GB	64 GB	512 GB	128 GB	1 TB
	Octa rank	128 GB	128 GB	1 TB	256 GB	1792 GB

Table 56. Memory module sockets

Memory module sockets	Speed
Sixteen 288-pin	2933 MT/s, 2666 MT/s

Storage controller specifications

The PowerEdge XE2420 system supports the following controller cards:

Table 57. PowerEdge XE2420 system controller cards

Internal controllers	External controllers
• PERC H740P • PERC H730P+ • PERC H330+ • S140 • HBA330 • Boot Optimized Storage Subsystem (BOSS-S1): HWRAID 2 x M.2 SSDs	External controller is not supported.

Drive specifications

Drives

The PowerEdge XE2420 system supports the following drive configurations:

Table 58. Supported drives

Configuration	Number of drives	Drive types
1A	up to 2 x 2.5-inch	SATA/NVME
2C	up to 4 x 2.5-inch	SATA/NVME/SAS
3A	up to 6 x SSDs	Enterprise and Data Center SSD Form Factor (EDSFF)

NOTE: In 2C configuration, hard drive slots 2 and 3 do not support NVMe drives if only one processor is installed.

NOTE: For more information about how to hot swap NVMe PCIe SSD U.2 device, see the *Dell Expres* ***> Browse all Products*** > ***Data Center Infrastructure*** > ***Storage Adapters & Controllers*** > ***Dell PowerEdge Express Flash NVMe PCIe SSD*** > ***Documentation*** > ***Manuals and Documents*** *s Flash NVMe PCIe SSD User's Guide* at https://www.dell.com/support.

Ports and connectors specifications

USB ports specifications

Table 59. PowerEdge XE2420 system USB specifications

Front		Rear		Internal	
USB port type	**No. of ports**	**USB port type**	**No. of ports**	**USB port type**	**No. of ports**
USB 3.0-compliant port	Two	N/A	N/A	Internal USB 3.0-compliant port	One
Micro USB 2.0-compliant port for iDRAC Direct	One				

NOTE: The micro USB 2.0 compliant port can only be used as an iDRAC Direct or a management port.

NIC ports specifications

The PowerEdge XE2420 system supports up to two 1 Gb LAN on motherboard with 10/100/1000 Mbps Network Interface Controller (NIC) ports that are located on the front panel. The system also supports LAN on Motherboard (LOM) on an optional riser card.

Serial connector specifications

The PowerEdge XE2420 system supports one serial connector on the front panel, which is a 9-pin connector, Data Terminal Equipment (DTE), 16550-compliant.

VGA ports specifications

The PowerEdge XE2420 system supports one 15-pin VGA ports on the front panel.

IDSDM

The PowerEdge XE2420 system supports Internal Dual SD module (IDSDM) with the below storage capacity:

- 16 GB
- 64 GB

NOTE: One IDSDM card slot is dedicated for redundancy.

NOTE: Use Dell EMC branded microSD cards that are associated with the IDSDM configured systems.

Video specifications

The PowerEdge XE2420 system supports integrated Matrox G200eR2 graphics controller with 16 MB of video frame buffer.

Table 60. Supported front video resolution options

Resolution	Refresh rate (Hz)
1600 x 900 (HD+)	60
1366 x 768 (HD)	60

Table 60. Supported front video resolution options (continued)

Resolution	Refresh rate (Hz)
1680 x 1050 (WSXGA+)	60
1280 x 1024 (SXGA)	60
1440 x 900 (WXGA+)	60
1920 x 1080 (FHD)	60
1280 x 800 (WXGA)	60

Environmental specifications

NOTE: For additional information about environmental certifications, see the *Product Environmental Datasheet* located with the Manuals and Documents on https://www.dell.com/support.

Operational climatic range category A2

Table 61. Operational climatic range category A2

Allowable continuous operations	
Temperature ranges for altitude ≤900 meters (≤2,953 ft.	10°C–35°C (50°F–95°F) with no direct sunlight on the platform
Humidity percent ranges (Noncondensing always)	8% RH with -12°C minimum dew hover over 80% RH with 21°C (69.8°F) maximum dew point
Operational altitude derating	Maximum temperature is reduced by 1°C/300 meters (1.8°F/984 ft) above 900 meters (2,953 ft)

Operational climatic range category A3

Table 62. Operational climatic range category A3

Allowable continuous operations	
Temperature ranges for altitude ≤900 meters (≤2,953 ft)	5°C–40°C (41°F–104°F) with no direct sunlight on the platform
Humidity percent ranges (Noncondensing always)	8% RH with -12°C minimum dew hover over 85% RH with 24°C (75.2°F) maximum dew point
Operational altitude derating	Maximum temperature is reduced by 1°C/175 meters (1.8°F/574 ft) above 900 meters (2,953 feet)

Thermal restriction for ASHRAE A3/Environment

- CPU TDP greater than 150 W are not supported.

Shared requirements across all categories

Table 63. Shared requirements across all categories

Allowable operations	
Maximum temperature gradient (applies to both operation and nonoperation)	20°C in an hour* (36°F in an hour) and 5°C in 15 minutes (9°F in 15 minutes), 5°C in an hour* (9°F in an hour) for tape hardware
Non-operational temperature limits	-40°C to 65°C (-40°F to 149°F)
Non-operational humidity limits	5% to 95% RH with 27°C (80.6°F) maximum dew point Atmosphere must be noncondensing always.
Maximum Non-operational altitude	12,000 meters (39,370 ft)
Maximum operational altitude	3,048 meters (10,000 ft)

*: Per ASHRAE thermal guidelines, these are not instantaneous rates of temperature change.

Table 64. Temperature specifications

Temperature	Specifications
Storage	-40–65°C (-40–149°F)
Continuous operation (for altitude less than 900 m or 2953 ft)	10–35°C (50–95°F) with no direct sunlight on the equipment
Expanded operating temperature	For information about Expanded operating temperature, see the Expanded operating temprature section.
Maximum temperature gradient (operating and storage)	20°C/h (68°F/h)

Table 65. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.21 G_{rms} at 5 Hz to 500 Hz (all operation orientations)
Storage	1.88 G_{rms} at 10 Hz to 500 Hz for 15 minutes (all six sides tested)

Table 66. Maximum shock pulse specifications

Maximum shock pulse	Specifications
Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axes of 6 G for up to 11 ms.(4 pulse on each side of the system)
Storage	Six consecutively executed shock pulses in the positive and negative x, y, and z axis (one pulse on each side of the system) of 71 G for up to 2 ms.

Table 67. Maximum altitude specifications

Maximum altitude	Specifications
Operating	3048 m (10,000 ft)
Storage	12,000 m (39,370 ft)

Table 68. Operating temperature derating specifications

Operating temperature derating	Specifications
Up to 35°C (95°F)	Maximum temperature is reduced by 1°C/300 m (1°F/547 ft), above 900 m (2,953 ft).
35–40°C (95–104°F)	Maximum temperature is reduced by 1°C/175 m (1°F/319 ft), above 900 m (2,953 ft).

Table 68. Operating temperature derating specifications (continued)

Operating temperature derating	Specifications
40–45°C (104–113°F)	Maximum temperature is reduced by 1°C/125 m (1°F/228 ft), above 900 m (2,953 ft).

Standard operating temperature

Table 69. Standard operating temperature specifications

Standard operating temperature	Specifications
Continuous operation (for altitude less than 950 m or 3117 ft)	10–35°C (50–95°F) with no direct sunlight on the equipment.

Expanded operating temperature

NOTE: When operating in the expanded temperature range, the performance of the system may be impacted.

NOTE: When operating in the expanded temperature range, ambient temperature warnings may be reported on the System Event Log.

Expanded operating temperature restrictions

Thermal Restriction for ASHRAE A4 Environment

- CPU TDP greater than 150 W are not supported within A4.
- Capacity greater than 128 GB of LRDIMMs are not supported within A4.
- Processor with TDP=150 W and 18 cores is not supported within A4.
- Processor with TDP=130 W and 8 cores is not supported within A4.
- PCIe card with TDP greater than 25 W is not supported.
- Intel N3000 FPGA card is not supported above 35°C ambient temperature.
- NVIDIA V100 is not supported above 40°C ambient temperature.
- Single PSU failure is not supported. Two PSUs are required in redundant mode.

Thermal Restriction for ASHRAE A3 Environment

- CPU TDP greater than 150 W are not supported within A3.
- Greater than 128 GB capacity LRDIMMs are not supported within A3.
- Processor with TDP=150 W and 24 cores is not supported within A3.
- Processor with TDP=150 W and 8 cores is not supported within A3.
- PCIe card with TDP greater than 25 W is not supported.
- Intel N3000 FPGA card is not supported above 35°C ambient temperature.
- Single PSU failure is not supported. Two PSUs are required in redundant mode.

Thermal Restriction for ASHRAE A2 Environment

- CPU TDP greater than 150 W are not supported within A2.
- Greater than 128 GB capacity LRDIMMs are not supported within A2.
- Processor with TDP=150 W and 8 cores is supported to ASHRAE A2 when turbo boost is disabled.
- Processor with TDP=150 W and 8 cores, with turbo boost will have over temperature event at 35°C ambient temperature. This is because the CPU's power consumption is instantly raised up to 160 W to 170 W.
- PCIe card with TDP greater than 25 W is not supported.
- Single PSU failure is not supported. Two PSUs are required in redundant mode.

Particulate and gaseous contamination specifications

The following table defines the limitations that help avoid any damages to the IT equipment and/or, or both failure from particulate and gaseous contamination. If the levels of particulate or gaseous pollution exceed the specified limitations and results in equipment damage or failure, you must rectify the environmental conditions. Remediation of environmental conditions is the responsibility of the customer.

Table 70. Particulate contamination specifications

Particulate contamination	Specifications
Air filtration	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit. **NOTE:** This condition applies to data center environments only. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor. **NOTE:** Air entering the data center must have MERV11 or MERV13 filtration. **NOTE:** Air filtering can also be accomplished by filtering room air with MERV8 filter per ANSI/ASHARE Standard 127.
Conductive dust	Air must be free of conductive dust, zinc whiskers, or other conductive particles. **NOTE:** This condition applies to data center and non-data center environments. **NOTE:** Common sources of conductive dust include manufacturing processes, and zinc whiskers from the plating on the bottom of raised floor tiles.
Corrosive dust	• Air must be free of corrosive dust. • Any remaining dust present in the air shall have a deliquescent point less than 60% relative humidity. **NOTE:** This condition applies to data center and non-data center environments.

Table 71. Gaseous contamination specifications

Gaseous contamination	Specifications
Copper Coupon Corrosion rate	<300 Å/month per Class G1 as defined by ANSI/ ISA71.04-2013
Silver Coupon Corrosion rate	<200 Å/month as defined by ANSI/ISA71.04-2013

NOTE: Maximum corrosive contaminant levels measured at ≤50% relative humidity.

Thermal restriction matrix

Table 72. Thermal restriction matrix for processor and fans

Features, processor type and specifications	Configuration type, and ambient temperature support		
Storage configuration	2 x 2.5-inch drives	4 x 2.5-inch drives	6 x SSDs (EDSFF E1.L)
	Fan type: Very High Performance fan (VHP fan)		

Table 72. Thermal restriction matrix for processor and fans (continued)

Features, processor type and specifications	Configuration type, and ambient temperature support	
TDP (W)	**Ambient = 35°C**	**Ambient = 35°C**
150	Yes (VHP fan)	Yes (VHP fan)

Table 73. Thermal restriction matrix for GPGPU

Riser configurations	Configuration type and ambient temperature support		
	2 x 2.5-inch drives	**4 x 2.5-inch drives**	**6 x SSDs (EDSFF E1.L)**
	Fan type: **Very High Performance fan (VHP fan)**		
	Ambient = 30°C		
1A (Slot 1 Riser)	VHP fan	VHP fan	
2C (Slot 1 Riser_PERC)	VHP fan	VHP fan	
3A (Slot 1 Riser)	VHP fan	VHP fan	
All (Slot 4 Riser)	VHP fan	VHP fan	

Table 74. Thermal limitations of supported processors

CPU TDP	HSK type	Fan type	Config 1A			Config 2C			Config 3A		
			ASHARE A4	ASHARE A3	ASHARE A2	ASHARE A4	ASHARE A3	ASHARE A2	ASHARE A4	ASHARE A3	ASHARE A2
6525 N, 24 Core, 150 W	High performance	Very high performance	Not supported		Max 35°C	Not supported		Max 35°C	Not supported		Max 35°C
6244, 8 Core, 150 W											
6240 Y, 18 Core, 150 W			Not supported	Max 40°C		Not supported	Max 40°C		Not supported	Max 40°C	
6252, 24 Core, 150 W			Max 45°C			Max 45°C			Max 45°C		
6238, 22 Core, 140 W											
6262 V, 8 Core, 135 W											
6234, 8 Core, 130 W			Not supported			Not supported			Not supported		
125 W			Max 45°C			Max 45°C			Max 45°C		
110 W											

Table 74. Thermal limitations of supported processors (continued)

CPU TDP	HSK type	Fan type	Config 1A			Config 2C			Config 3A		
			ASHARE A4	ASHARE A3	ASHARE A2	ASHARE A4	ASHARE A3	ASHAR E A2	ASHARE A4	ASHARE A3	ASHARE A2
100 W											
85 W											

Table 75. Thermal limitations of PCI-E cards

PCI-E card type	Config 1A			Config 2C			Config 3A		
	ASHARE A4	ASHARE A3	ASHARE A2	ASHARE A4	ASHARE A3	ASHARE A2	ASHARE A4	ASHARE A3	ASHARE A2
nVIDIA V100 GPU	Not supported	Max 40°C	Max 35°C	Not supported	Max 40°C	Max 35°C	Not supported	Max 40°C	Max 35°C
nVIDIA T4 GPU	Max 45°C			Max 45°C			Max 45°C		
nVIDIA RTX6000 passive GPU									
Intel N3000 FPGA	Not supported		Max 35°C	Not supported		Max 35°C	Not supported		Max 35°C
U200 FPGA	Max 45°C	Max 40°C		Max 45°C	Max 40°C		Max 45°C	Max 40°C	

8

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
- Using system diagnostics

System health and system ID indicator codes

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

Figure 129. System health and system ID indicator

1. System health and system ID indicator

Table 76. System health and system ID indicator codes

System health and system ID indicator code	Condition
Solid blue	Indicates that the system is powered on, 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.
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. Cable length should not exceed 3 feet (0.91 meters). Performance could be affected by cable quality. The following table describes iDRAC Direct activity when the iDRAC Direct port is active:

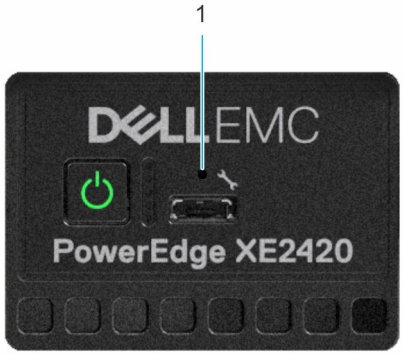


Figure 130. iDRAC Direct LED indicator

1. iDRAC Direct LED indicator

Table 77. iDRAC Direct LED indicator codes

iDRAC Direct LED indicator code	Condition
Solid green for two seconds	Indicates that the laptop or tablet is connected.
Blinking 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.

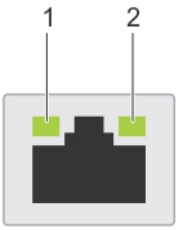


Figure 131. NIC indicator codes

1. Link LED indicator
2. Activity LED indicator

Table 78. NIC indicator codes

NIC indicator codes	Condition
Link and activity indicators are off.	Indicates that the NIC is not connected to the network.

Table 78. NIC indicator codes (continued)

NIC indicator codes	Condition
Link indicator is green, and activity indicator is blinking green.	Indicates that 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.	Indicates that the NIC is connected to a valid network at less than its maximum port speed, and data is being sent or received.
Link indicator is green, and activity indicator is off.	Indicates that 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.	Indicates that the NIC is connected to a valid network at less than its maximum port speed, and data is mot being sent or received.
Link indicator is blinking green, and activity is off.	Indicates that the 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 if power is present or if a power fault has occurred.

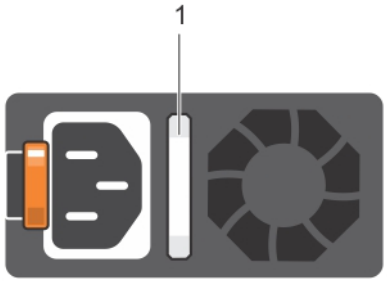


Figure 132. AC PSU status indicator

1. AC PSU status indicator/handle

Table 79. AC PSU status indicator codes

Power indicator codes	Condition
Green	Indicates that a valid power source is connected to the PSU and the PSU is operational.
Blinking amber	Indicates an issue with the PSU.
Not powered on	Indicates that the power is not connected to the PSU.
Blinking green	Indicates that the firmware of the PSU is being updated. **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 powers off	When hot-plugging a PSU, it blinks green five times at a rate of 4 Hz and powers off. This indicates a PSU mismatch due 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: If two PSUs are used, they must be of the same type and have the same maximum output power.** **CAUTION: When correcting a PSU mismatch, replace the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition**

Table 79. AC PSU status indicator codes (continued)

Power indicator codes	Condition
	and an 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.**

Table 80. DC PSU status indicator codes

Power indicator codes	Condition
Green	Indicates that a valid power source is connected to the PSU, and the PSU is operational.
Blinking amber	Indicates an issue with the PSU.
Not powered on	Indicates that the power is not connected to the PSU.
Blinking green	When hot-plugging a PSU, it blinks green five times at a rate of 4 Hz and powers off. This indicates a PSU mismatch due 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: If two PSUs are used, they must be of the same type and have the same maximum output power.** **CAUTION: When correcting a PSU mismatch, replace the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition and an unexpected system shutdown. To change from a High Output configuration to a Low Output configuration or conversely, you must power off the system.** **CAUTION: Combining AC and DC PSUs is not supported.**

Drive indicator codes

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

Figure 133. 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 power on.

NOTE: Drive status indicator behavior is managed by Storage Spaces Direct. Not all drive status indicators may be used.

Table 81. Drive indicator codes

Drive status indicator code	Condition
Blinks green twice per second	Indicates that the drive is being identified or preparing for removal.
Off	Indicates that the drive is ready for removal. **NOTE:** The drive status indicator remains off until all drives are initialized after the system is powered on. Drives are not ready for removal during this time.
Blinks green, amber, and then powers off	Indicates that there is an expected drive failure.
Blinks amber four times per second	Indicates that the drive has failed.
Blinks green slowly	Indicates that the drive is rebuilding.
Solid green	Indicates that the drive is online.
Blinks green for three seconds, amber for three seconds, and then powers off after six seconds	Indicates that the rebuild has stopped.

EDSFF LED indicators

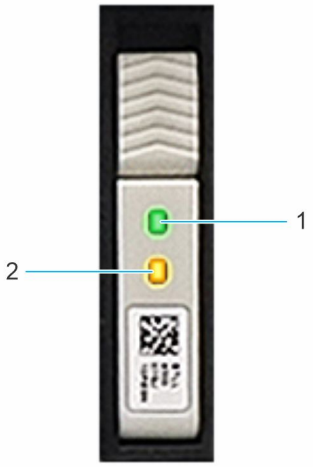


Figure 134. EDSFF LED indicators

1. Drive activity LED indicator
2. Drive status LED indicator

Table 82. EDSFF LED indicators

Green status indicator code	Amber status indicator code	Drive condition
OFF	OFF	Indicates that the drive is offline.
ON	OFF	Indicates that the drive is online.
4Hz flashing	OFF	Indicates that there is activity on the drive.
NA	4Hz flashing	Indicates that the drive is being identified or preparing for removal.
	ON	Indicates that the drive has failed.
	Two fast blinks at 4Hz and pause for 0.5 seconds	Indicates that there is an expected drive failure (SMART) .
	1Hz flashing	Indicates that the drives rebuilding is aborted.
	1Hz flashing	Indicates that the drive is rebuilding.

Using system diagnostics

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

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 provide 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 issues encountered during testing

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.

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.

Results

System diagnostic controls

Table 83. 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.

9

Getting help

Topics:

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.

Contacting Dell

Dell provides online and telephone based support and service options. If you do not have an active internet connection, you can find Dell contact information on your purchase invoice, packing slip, bill or Dell product catalog. The availability of services varies depending on the 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 the system Service Tag in the **Enter a Service Tag, Serial Number, Service Request, Model, or Keyword** 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 Global Technical Support
   b. The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the information tag in the of the XE2420 system, to access information about Dell EMC PowerEdge XE2420.

Prerequisites

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

The QRL includes the following information about your system:

- How-to videos
- Reference materials, including the Installation and Service Manual, and mechanical overview
- The system service tag to quickly access the 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 smart phone 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 PowerEdge XE2420 system

Figure 135. Quick Resource Locator for PowerEdge XE2420 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.

10

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 EMC 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 84. Additional documentation resources for your system

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 rail solution. For information about setting up your system, see the *Getting Started Guide* document that is shipped with your system.	www.dell.com/dssmanuals
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.	www.dell.com/idracmanuals

Table 84. Additional documentation resources for your system (continued)

Task	Document	Location
	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**.	www.dell.com/idracmanuals
	For information about installing the operating system, see the operating system documentation.	www.dell.com/operatingsystemmanuals
	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 systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	www.dell.com/openmanagemanuals
	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 and using Dell SupportAssist, see the Dell EMC SupportAssist Enterprise User's Guide.	www.dell.com/openmanagemanuals > OpenManage Server Administrator
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	www.dell.com/openmanagemanuals
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