Dell PowerEdge XE8640

Installation and Service Manual

D&LL Technologies

Notes, cautions, and warnings

(i) **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

About this document

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

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Dell PowerEdge XE8640 system overview

The Dell PowerEdge XE8640 system is Dell's latest 2-socket, 4U accelerated rack server that is designed to run complex, compute intensive workloads using the latest industry acceleration technology, as well as highly scalable memory, I/O, and network options.

The system features:

- Two 4th Generation Intel Xeon Scalable processors with up to 56 cores
- Sixteen or thirty two DDR5 DIMM slots
- Four redundant AC or DC power supply units
- Up to 8 x 2.5-inch NVMe SSD drives
- Up to 8 x E3.S NVMe SSD drives

(i) **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** > **Infrastructure** > **Data Center Infrastructure** > **Storage Adapters & Controllers** > **Dell PowerEdge Express Flash NVMe PCIe SSD** > **Select This Product** > **Documentation** > **Manuals and Documents**.

(i) **NOTE:** All instances of SAS, SATA drives are referred as drives in this document, unless specified otherwise.

⚠ **CAUTION: Do not install GPUs, network cards, or other PCIe devices on your system that are not validated and tested by Dell. Damage caused by unauthorized and invalidated hardware installation will null and void the system warranty.**

Topics:

- System configurations - Front view for PowerEdge XE8640
- System configurations - Rear view for PowerEdge XE8640
- System configurations - Inside view for PowerEdge XE8640
- System information label
- Locating the Express Service Code and Service Tag
- Rail sizing and rack compatibility matrix
- Product positioning

System configurations - Front view for PowerEdge XE8640
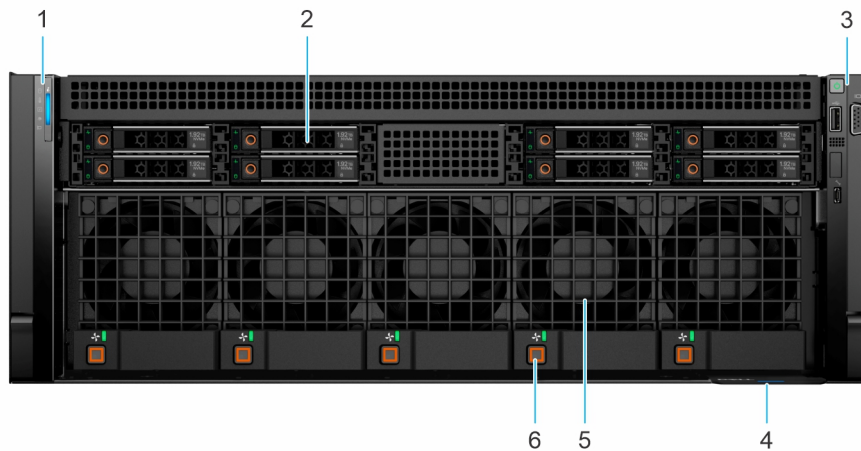
Figure 1. Front view 8 x U.2 drive system

Table 1. Features available on the front of the system

Item	Ports, panels, and slots	Description
1	Left control panel	Contains the system health, system ID, and the status LED indicator.
2	Drives	Enables you to install drives that are supported on your system.
3	Right control panel	Contains the power button, USB port, iDRAC Direct (Micro-AB USB) port.
4	Express Service Tag	The Express Service Tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address, and so on. If you have opted for the secure default access to iDRAC, the Express Service Tag will also contain the iDRAC secure default password.
5	GPU fan	Enables you to install GPU fans for thermal regulation.
6	GPU fan release button	Press the release button to slide the GPU fan out of the system.

Figure 2. Front view 8 x E3.S drive system

Table 2. Features available on the front of the system

Item	Ports, panels, and slots	Description
1	Left control panel	Contains the system health, system ID, and the status LED indicator.
2	Drives	Enables you to install drives that are supported on your system.
3	Right control panel	Contains the power button, USB port, iDRAC Direct (Micro-AB USB) port.
4	Express Service Tag	The Express Service Tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address, and so on. If you have opted for the secure default access to iDRAC, the Express Service Tag will also contain the iDRAC secure default password.
5	GPU fan	Enables you to install GPU fans for thermal regulation.
6	GPU fan release button	Press the release button to slide the GPU fan out of the system.

Left Control Panel (LCP) view

Figure 3. Left control panel

Table 3. Left control panel

Item	Indicator, button, or connector	Icon	Description
1	System health and system ID indicator	N/A	Indicates the system health. For more information, see the System health and system ID indicator codes section.
2	Status LED indicators	*i*	Indicates the status of the system. For more information, see the Status LED indicators section.

ⓘ **NOTE:** For more information about the indicator codes, see the System diagnostics and indicator codes section.

Right Control Panel (RCP) view
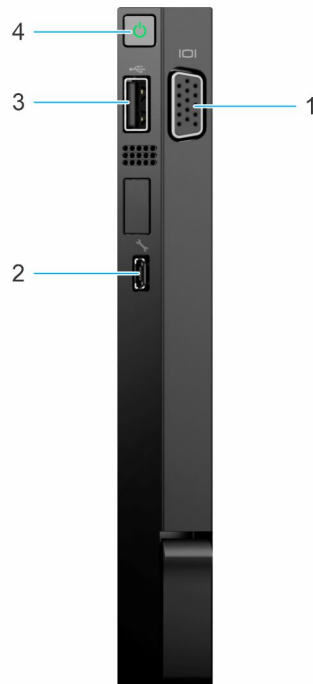
Figure 4. Right control panel view

Table 4. Right control panel

Item	Indicator or button	Icon	Description
1	VGA port	▯◻▯	Enables you to connect a display device to the system. For more information, see the www.dell.com/poweredgemanuals.
2	iDRAC Direct port (Micro-AB USB)	🔧	The iDRAC Direct port (Micro-AB USB) enables you to access the iDRAC Direct Micro-AB features. For more information, see the *Integrated Dell Remote Access Controller User's Guide* available at https://www.dell.com/idracmanuals. ⓘ **NOTE:** 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 ft (0.91 meters). Performance could be affected by cable quality.
3	USB 2.0-compliant port	⎓	The USB port is a 4-pin connector and 2.0-compliant. This port enables you to connect USB devices to the system.
4	Power button	⏻	Indicates if the system is powered on or off. Press the power button to manually power on or off the system. ⓘ **NOTE:** Press the power button to gracefully shut down the ACPI-compliant operating system.

System configurations - Rear view for PowerEdge XE8640
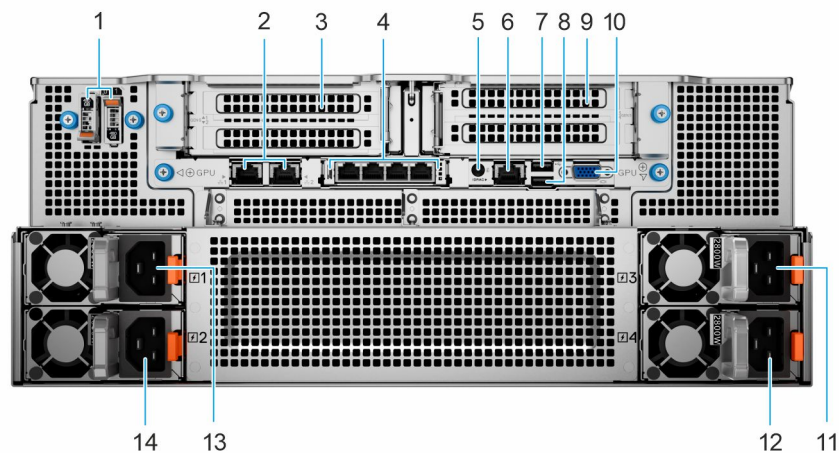
Figure 5. Rear view of XE8640 system

Table 5. Rear view of the system

Item	Ports, panels, or slots	Icon	Description
1	BOSS-N1	N/A	There are two M.2 connectors that are populated on the board and support two NVMe drives for boot.
2	NIC Ports	⛗	The NIC ports that are integrated on the LOM card provide network connectivity which is connected to the system board.
3	PCIe expansion card riser 1 (R1)	N/A	The expansion card riser enables you to connect PCI Express expansion cards.
4	OCP NIC port (optional)	N/A	The OCP NIC card supports OCP 3.0. The NIC ports are integrated on the OCP card which is connected to the system board.
5	System Identification (ID) button	ⓘ	The System Identification (ID) button is available on the front and back of the system. Press the button to identify a system in a rack by turning on the system ID button. You can also use the system ID button to reset iDRAC and to access BIOS using the step through mode. When pressed, the system ID LED in the back panel blinks until either the front, or rear button is pressed again. Press the button to toggle between on or off mode. ⓘ **NOTE:** If the server stops responding during POST, press and hold the System ID button for more than five seconds to enter the BIOS progress mode. ⓘ **NOTE:** To reset the iDRAC (if not disabled on the iDRAC setup page by pressing F2 during system boot), press and hold the System ID button for more than 15 seconds.
6	iDRAC dedicated port	🔧	Enables you to remotely access iDRAC. For more information, see the Integrated *Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals.
7	USB 2.0 port	⚡	The USB port is 4-pin, 2.0-compliant. This port enables you to connect USB devices to the system.
8	USB 3.0 port	ss⚡	The USB port is 9-pin and 3.0-compliant. This port enables you to connect USB devices to the system.

Table 5. Rear view of the system (continued)

Item	Ports, panels, or slots	Icon	Description
9	PCIe expansion card riser 4(R4)	N/A	The expansion card riser enables you to connect PCI Express expansion cards.
10	VGA port	⌷	Enables you to connect a display device to the system.
11	Power supply unit (PSU3)	3	Indicates the PSU3.
12	Power supply unit (PSU4)	4	Indicates the PSU4.
13	Power supply unit (PSU1)	1	Indicates the PSU1 or primary PSU.
14	Power supply unit (PSU2)	2	Indicates the PSU2.

System configurations - Inside view for PowerEdge XE8640
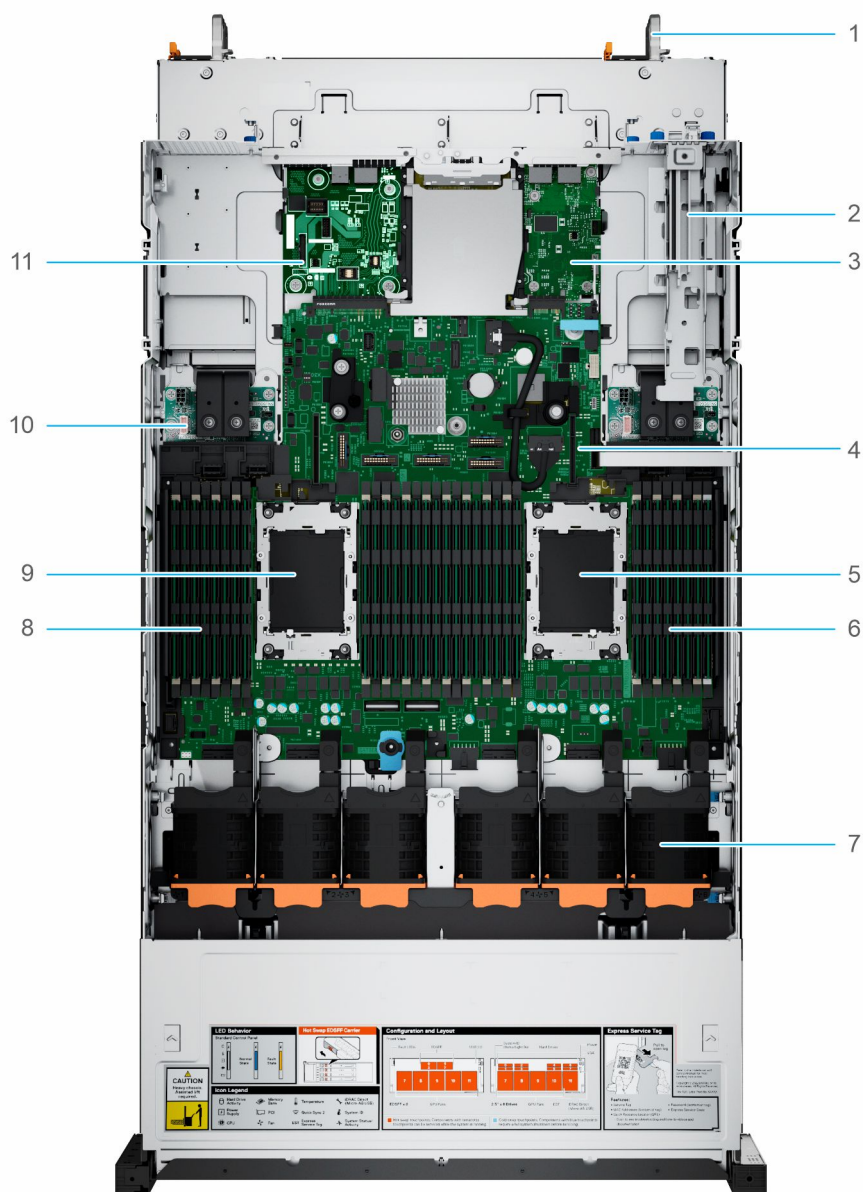
Figure 6. Top level - Inside view of the XE8640 system

1. Power supply 1
2. BOSS-N1 cage
3. LOM
4. System board
5. Processor 1
6. Memory modules for Processor 1
7. Fan
8. Memory modules for Processor 2
9. Processor 2
10. VSB
11. Rear I/O card
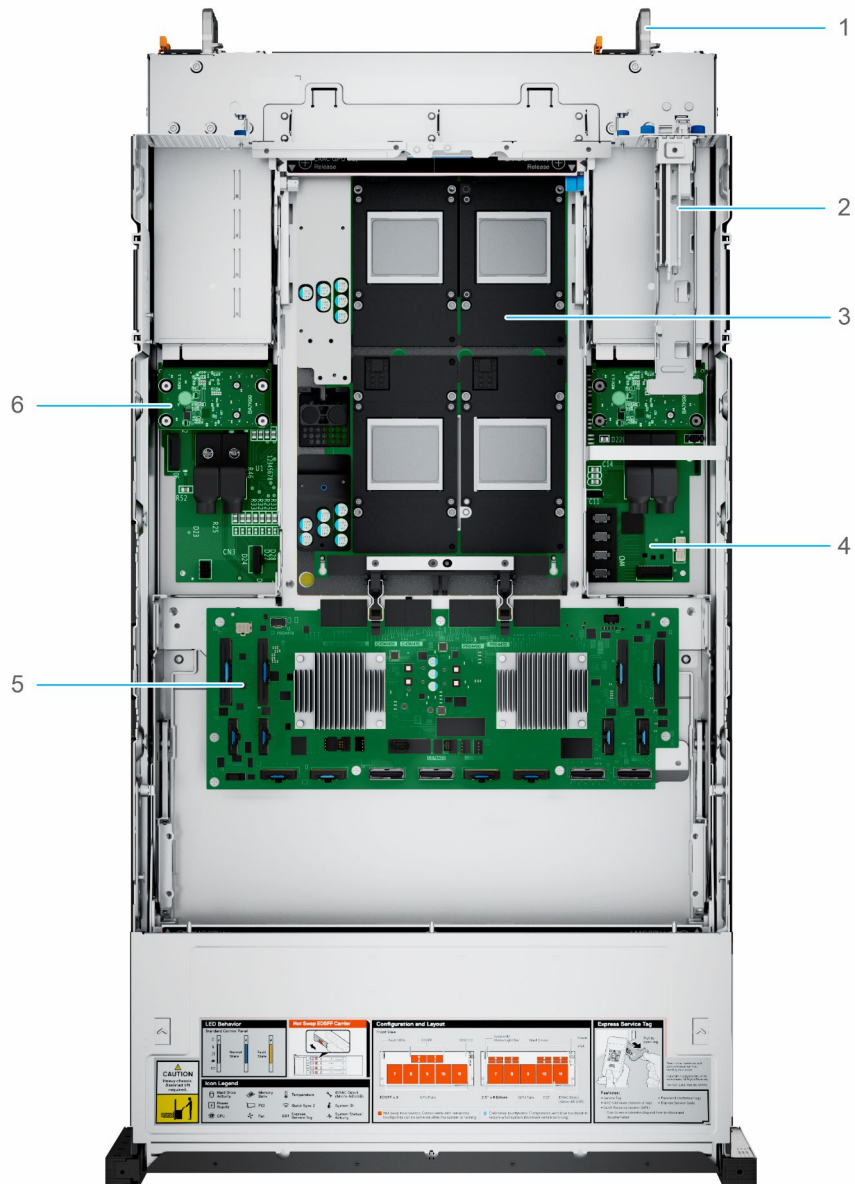
Figure 7. GPU H100 Inside view

1. Power supply 1
3. GPU
5. PCIe Switch Board (PSB)

2. BOSS-N1 cage
4. Power Distribution Board (PDB)
6. VSB
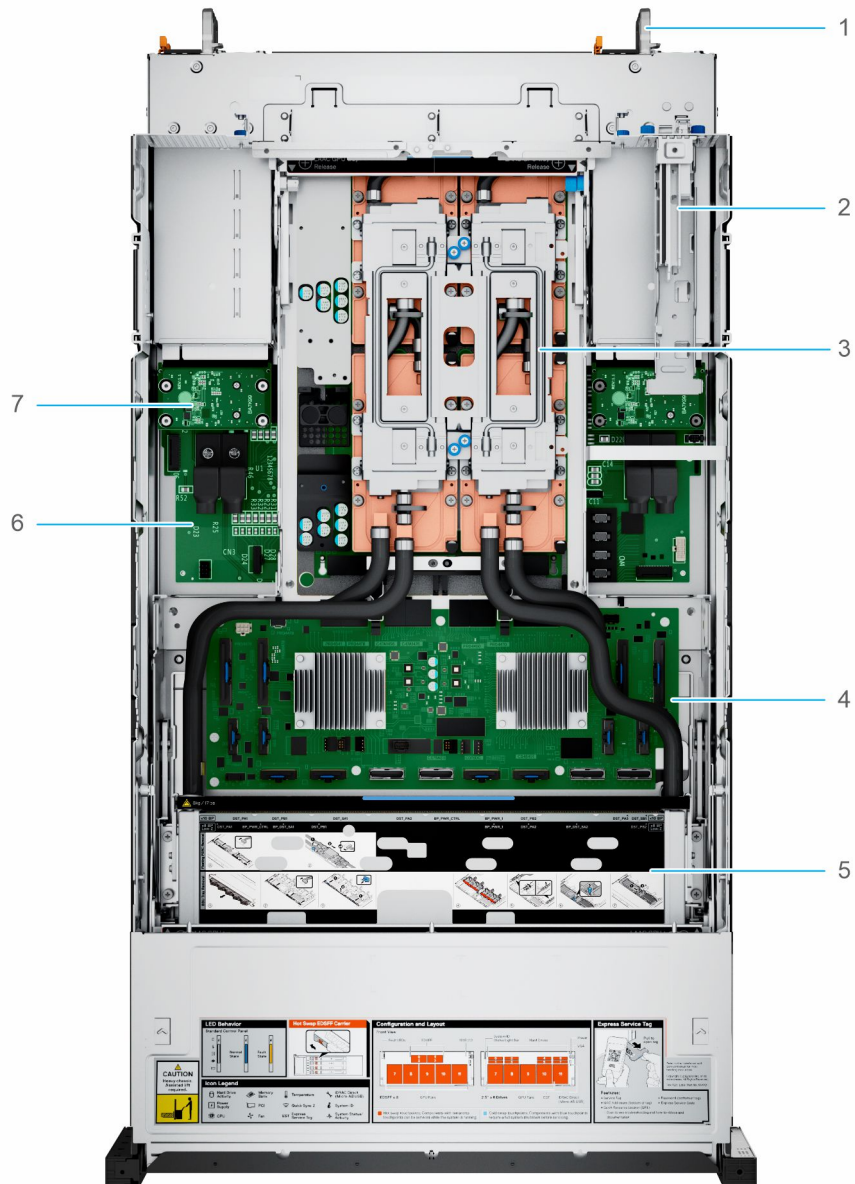
Figure 8. GPU H100 with LAAC Inside view

1. Power supply 1
2. BOSS-N1 cage
3. GPU holder
4. PCIe Switch Board (PSB)
5. Liquid Assisted Air Cooling(LAAC) Radiator
6. Power Distribution Board (PDB)
7. Versabay (VSB)
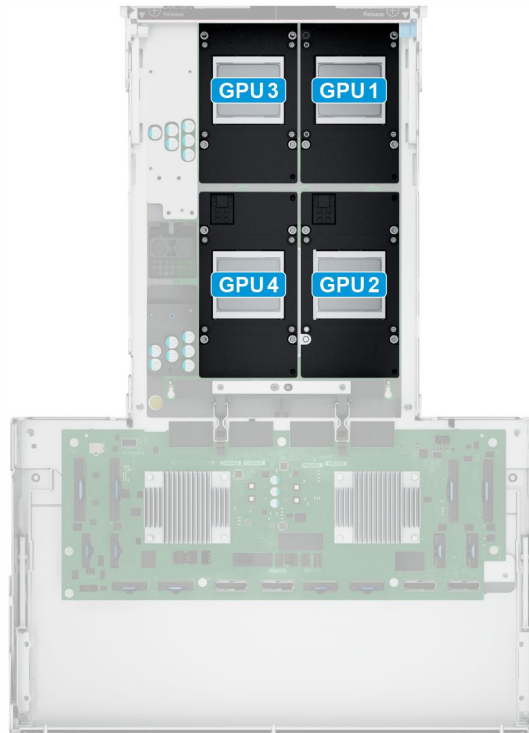
Figure 9. GPU numbering

System information label

The system information label is located on the back side of the system cover.
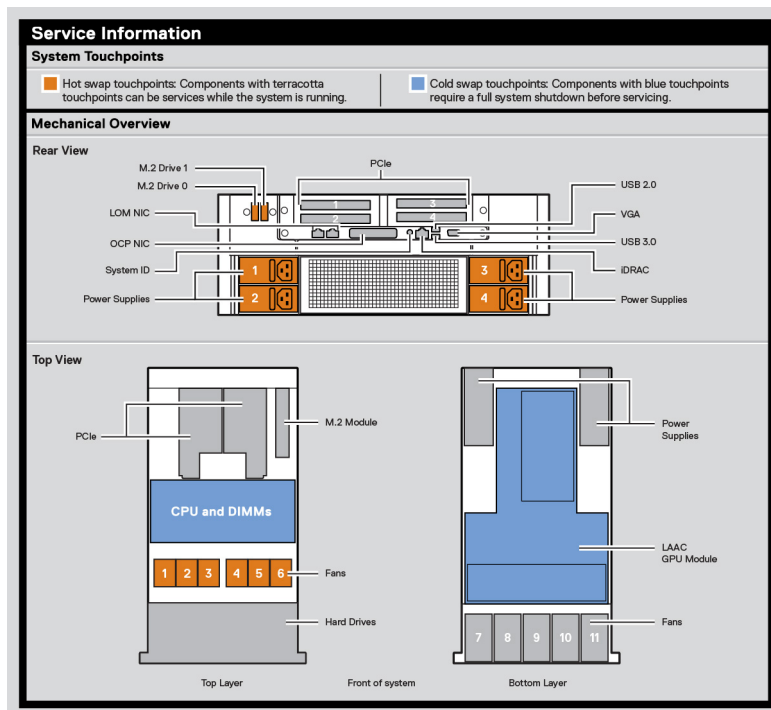
Figure 10. Service information

Figure 11. Memory information

Figure 12. Electrical overview

Figure 13. Hot Swap and System Tasks

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 front of the system 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.

Figure 14. Locating the Express Service Code and Service tag

1. Information tag (front view)
2. Information tag (back view)
3. OpenManage Mobile (OMM) label
4. iDRAC MAC address and iDRAC secure password label
5. Service Tag, Express Service Code, QRL label

The Exp Svc Code is used by Dell to route support calls to the appropriate personnel.

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

Rail sizing and rack compatibility matrix

For specific information about the rail solutions compatible with your system, see the *Dell 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 that is listed below:

● Specific details about rail types and their functionalities.
● Rail adjustability range for various types of rack mounting flanges.
● Rail depth with and without cable management accessories.
● Types of racks supported for various types of rack mounting flanges.

Product positioning

● **Performance**
  ○ Two 4th Generation Intel Xeon Scalable processors with up to 56 cores
  ○ 32 DDR5 DIMM slots
  ○ Up to 4 x PCIe Gen5 slots
● **Availability**
  ○ Four Redundant AC or DC power supply unit (PSU)
  ○ Hot-plug and hot swappable PSUs, drives, and cooling fans
  ○ Five high performance gold (HPR) GPU fans
  ○ iDRAC with Lifecycle Controller
  ○ Four NVIDIA H100 SXM5 GPU
● **Expandability and I/O Storage**
  ○ 8 x 2.5-inch hot-swappable NVMe drives
  ○ 8 x E3.S hot-swappable NVMe drives

Technical specifications

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

Topics:

- Chassis dimensions
- System weight
- Processor specifications
- PSU specifications
- Cooling fan specifications
- Supported operating systems
- System battery specifications
- Expansion card riser specifications
- Memory specifications
- Storage controller specifications
- Drives
- GPU Specifications
- Ports and connectors specifications
- Video specifications
- Environmental specifications

Chassis dimensions
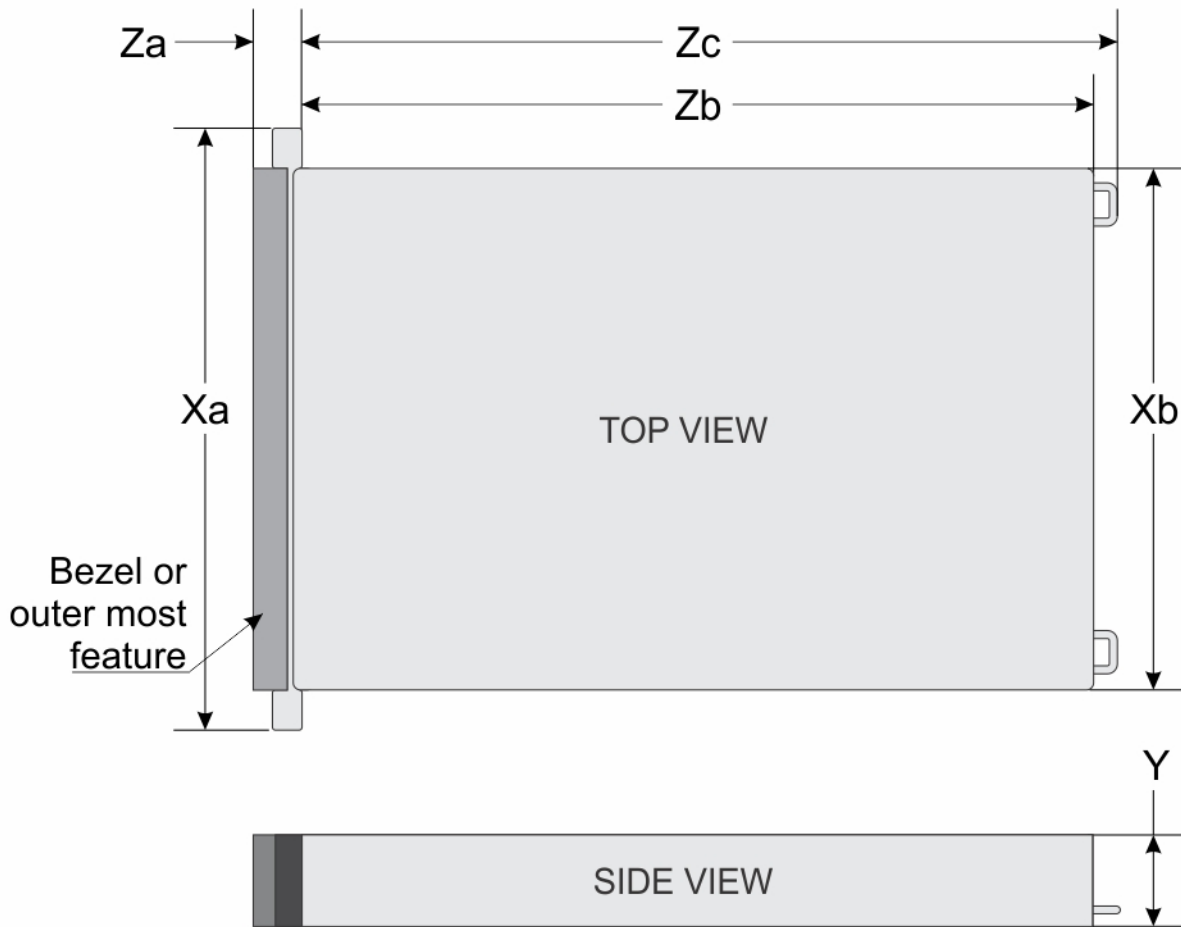
Figure 15. Chassis dimensions

Table 6. PowerEdge XE8640 chassis dimensions

Drives	Xa	Xb	Y	Za	Zb	Zc
8 x 2.5-inch	481.91 mm (18.97 inches)	447 mm (17.6 inches)	174.3 mm (6.86 inches)	34.70 mm (1.366 inches)With bezel	830.7 mm (32.7 inches)Ear to rear wall	865.54 mm (34.07 inches)Ear to PSU handle

ⓘ **NOTE:** Zb is the nominal rear wall external surface where the system board I/O connectors reside.

System weight

Table 7. PowerEdge XE8640 system weight

System configuration	Maximum weight (with all drives/SSDs)
8 x 2.5 inch	61.4 kg (135.36 lb)

Table 8. PowerEdge system weight handling recommendations

Chassis weight	Description
40 pounds - 70 pounds	Recommend two person to lift
70 pounds- 120 pounds	Recommend three person to lift
≥ 121 pounds	Recommend to use a server-lift

Processor specifications

Table 9. PowerEdge XE8640 processor specifications

Supported processor	Number of processors supported
4th Generation Intel Xeon Scalable processors with up to 56 cores	Two

PSU specifications

The PowerEdge XE8640 system supports up to four AC power supply units (PSUs) with 3+1 (full redundancy) and 2+2 Fault Tolerance Redundant(FTR), auto-sensing, and auto-switching capability.

Table 10. PSU specifications

PSU	Class	Heat dissipation (maximum) (BTU/hr)	Frequency (Hz)	Voltage	AC		DC	Current (A)
					High line 240 VDC	Low line 100–120 V		
2800 W AC	Titanium	10500 BTU/hr	50/60	200–240 V AC autoranging	2800 W	N/A	N/A	15.6 A
2800 W DC	N/A	10500 BTU/hr	N/A	240 V DC	N/A	N/A	N/A	13.6 A

Cooling fan specifications

The PowerEdge XE8640 system supports up to six high performance 60 mm fans in the mid fan frame and five high performance 80 mm fans in the front for GPU cooling.

Each fan is enclosed in a mechanical assembly to make up the module. The fan modules are hot-swappable with one rotor fan fail. The system should always be populated with the full set of fans to support the airflow requirements of the chassis

For more information about the supported fan configuration or matrix, see Thermal restriction matrix.

Table 11. Cooling fan specifications

Fan type	Abbreviation	Label color	Label image
Standard (STD) 60 mm fan	STD	No label	
High performance (HPR) Gold 80 mm fan	HPR Gold	Replace Fan in 3 minutes	

Supported operating systems

The PowerEdge XE8640 system supports the following operating systems:

● Canonical Ubuntu Server LTS
● Red Hat Enterprise Linux

For more information, go to www.dell.com/ossupport.

System battery specifications

The PowerEdge XE8640 system uses one CR 2032 3.0-V lithium coin cell battery.

Expansion card riser specifications

The PowerEdge XE8640 system supports up to four PCI express (PCIe) slots (Gen5 full-height, half-length cards) on the system board.

Table 12. Expansion card riser slots

Expansion card risers	PCIe slot	Processor connection	Height	Length	Slot width
Riser 1A	Slot 1	Processor 1	Full Height	Half Length	x16
	Slot 2	Processor 1	Full Height	Half Length	x16
Riser 4A	Slot 3	Processor 2	Full Height	Half Length	x16
	Slot 4	Processor 2	Full Height	Half Length	x16

Memory specifications

The PowerEdge XE8640 system supports the following memory specifications for optimized operation.

ⓘ **NOTE:** Up to 16 DIMM per processor and up to 32 DIMMs in a dual- processor configuration. XE8640 supports RDIMM only.

ⓘ **NOTE:** For best performance, populate all memory channels equally, 16 DIMMs per CPU using identical DIMMs.

Table 13. Memory specifications

DIMM type	DIMM rank	DIMM capacity	Single processor		Dual processors	
			Minimum system capacity	Maximum system capacity	Minimum system capacity	Maximum system capacity
RDIMM	Dual rank	32 GB	32 GB	512 GB	64 GB	1 TB
	Dual rank	64 GB	64 GB	1 TB	128 GB	2 TB
	Quad rank	128 GB	128 GB	2 TB	256 GB	4 TB

Table 14. Memory module sockets

Memory module sockets	Speed
32, 288-pin	4800 MT/s, 4400 MT/s, 3200 MT/s

ⓘ **NOTE:** Memory DIMM slots are not hot pluggable.

Storage controller specifications

. The PowerEdge XE8640 system supports the following controller cards:

Table 15. Storage controller cards

Supported storage controller card
Internal Boot ● Boot Optimized Storage Subsystem (NVMe BOSS-N1): HWRAID 1, 2 x M.2 SSDs
Software RAID ● S160

Drives

The PowerEdge XE8640 system supports:
● 8 x 2.5 inch hot-swappable NVMe SSD drives.

(i) **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**.

GPU Specifications

The PowerEdge XE8640 system supports 4 NVIDIA HGX H100 80GB 700W SXM5 GPUs, fully interconnected with NVIDIA NVLink technology.

Ports and connectors specifications

NIC port specifications

The PowerEdge XE8640 system supports up to two 10/100/1000 Mbps Network Interface Controller (NIC) ports embedded on the LAN on Motherboard (LOM) and integrated on the optional Open Compute Project (OCP) cards.

Table 16. NIC port specification for the system

Feature	Specifications
LOM card	1 GbE x 2
OCP card (OCP 3.0)	10 GbE x 4, 25 GbE x 2, 25 GbE x 4

USB ports specifications

Table 17. PowerEdge XE8640 USB specifications

Front		Rear	
USB port type	**No. of ports**	**USB port type**	**No. of ports**
USB 2.0-compliant port	One	USB 2.0-compliant port	One
iDRAC Direct port (Micro-AB USB 2.0-compliant port)	One	USB 3.0-compliant ports	One

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

iDRAC port specifications

The PowerEdge XE8640 system supports One RJ45 iDRAC9 ethernet port on the rear of the system.

VGA ports specifications

The PowerEdge XE8640 system supports One DB-15 VGA port one each on the front and back of the system.

Video specifications

The PowerEdge XE8640 system supports integrated Matrox G200 graphics controller with 16 MB of video frame buffer.

Table 18. Supported video resolution options

Resolution	Refresh rate (Hz)	Color depth (bits)
1024 x 768	60	8, 16, 32
1280 x 800	60	8, 16, 32
1280 x 1024	60	8, 16, 32
1360 x 768	60	8, 16, 32
1440 x 900	60	8, 16, 32
1600 x 900	60	8, 16, 32
1600 x 1200	60	8, 16, 32
1600 x 1200	60	8, 16, 32
1680 x 1050	60	8, 16, 32
1920 x 1080	60	8, 16, 32
1920 x 1200	60	8, 16, 32

Environmental specifications

ⓘ **NOTE:** For additional information about environmental certifications, refer to the **Product Environmental Datasheet** located with the **Documentation** on www.dell.com/support/home.

Table 19. Continuous Operation Specifications for ASHRAE A2

Operational climatic	Allowable continuous operations
Temperature range for altitudes <= 900 m (<= 2953 ft)	10–35ºC (50–95ºF) with no direct sunlight on the equipment
Humidity percent range (non-condensing at all times)	8% RH with -12ºC minimum dew point to 80% RH with 21ºC (69.8ºF) maximum dew point
Operational altitude de-rating	Maximum temperature is reduced by 1ºC/300 m (1.8ºF/984 Ft) above 900 m (2953 Ft)

Table 20. Common Environmental Specifications for ASHRAE A2, A3, A4 and Rugged

Shared requirements	Allowable continuous operations
Maximum temperature gradient (applies to both operation and non-operation)	20ºC in an hour* (36ºF in an hour) and 5ºC in 15 minutes (9ºF in 15 minutes), 5ºC in an hour* (41ºF in an hour) for tape ⓘ **NOTE:** * - Per ASHRAE thermal guidelines for tape hardware, these are not instantaneous rates of temperature change.
Non-operational temperature limits	-40 to 65ºC (-104 to 149ºF)
Non-operational humidity limits	5% to 95% RH with 27ºC (80.6ºF) maximum dew point
Maximum non-operational altitude	12,000 meters (39,370 feet)
Maximum operational altitude	3,048 meters (10,000 feet)

Table 21. 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 22. Maximum shock pulse specifications

Maximum shock pulse	Specifications
Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axis of 6 G for up to 11 ms.
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.

Thermal restrictions

- ASHRAE A3/A4 environment is not supported.
- Required to constrain the GPU fan service time to maximum 3 minutes once the environment temp is up to 32°C.
- LAAC Pump failure or absence:
  - Any one of pump failure or absence: PDB CPLD record the status for iDRAC to log the failure and drive all fans to full speed.
  - Any two of pump failure: PDB CPLD record the status for iDRAC to log the failure and trigger pFAULT to shut down the system for system protection.
  - Any two of pump absence during the initial system power-on process: iDRAC checks the pump presence status from PDB CPLD MM to gate the power on process and log the message.
- LAAC Leak detected: Once the coolant leak is detected, CPLD proceeds the pFAULT process to perform system shutdown.
- LAAC Coolant loss by evaporation: There is no indicator to detect the percentage of coolant loss.
  - The failure symptom would be GPU throttling/overheat or pump RPM warning.
- Hard drive blank is required if the slot does not install hard drive.
- DIMM blank is not required to be install if the total memory populated is more or equal to16.
- Do not support net system airflow display in iDRAC WebGUI.
- BCME 100G_2P FH card (FPM6F) requires 85C active optics transceiver/4WGYD. (NOT support MFS1S00-H003E cable.)
- MLNX 100G_2P FH card (8P2T2) requires 85C active optics transceiver/4WGYD. (NOT support MFS1S00-H003E cable.)
- Broadcom 25GbE_4P OCP 3.0 card (3Y64D) require 85C active optics transceiver/M14MK. (NOT support 0YR96 cable.)
- MLNX 200GbE_SP_CX6 FH card (1GK7G) requires 85C active optics transceiver/4WGYD. (NOT support MFS1S00-H003E cable.)
- MLNX 100GbE_SP_CX6 FH card (Y1T43) requires 85C active optics transceiver/4WGYD. (NOT support MFS1S00-H003E cable.)
- MLNX 100GbE_2P OCP 3.0 card (FD63G) requires 85C active optics transceiver/4WGYD. (NOT support MFS1S00-H003E cable.)
- Broadcom 100GbE_2P OCP 3.0 card (2VY37) require 85C active optics transceiver/4WGYD. (NOT support MFS1S00-H003E cable.)
- PCIe riser board is required to be in place all the time. (I2C failure is triggered if the PCIe riser board is not in place.)
- Do not support dual fan or pump rotor failure including "one GPU fan or HPR GOLD fan rotor failure plus one pump rotor failure scenario".

Thermal restriction matrix

Table 23. Thermal restriction matrix

XE8640				8x 2.5" U.2 / NVMe	8x 2.5" E.3	8x 2.5" U.2 / SAS SSD
Front configuration				8x 2.5" U.2 / NVMe	8x 2.5" E.3	8x 2.5" U.2 / SAS SSD
Additional attributes				4 x Nvidia H100 700W	4 x Nvidia H100 700W	4 x Nvidia H100 700W
Rear configuration				4xFH	4xFH	4xFH
Fan type				HPR Gold fan	HPR Gold fan	HPR Gold fan
Heatsink type				Standard heatsink for CPU and LAAC for GPU	Standard heatsink for CPU and LAAC for GPU	Standard heatsink for CPU and LAAC for GPU
CPU TDP	Processor	TDP	Core count	35°C	35°C	35°C
	5418Y	185W	24	35°C	35°C	35°C
	6448Y/6442Y	225W	32/24	35°C	35°C	35°C
	8462Y+	300W	32	35°C	35°C	35°C
	8460Y+	300W	40	35°C	35°C	35°C
	8452Y	300W	36	35°C	35°C	35°C
	8480+/8470/8468	350W	56/52/48	35°C	35°C	35°C

Table 24. Memory Thermal restriction matrix

XE8640		1 DPC	2DPC	temperature
DIMM	128GB RDIMM 4800	13.8W	10.7W	35°C
	64GB RDIMM 4800	12.0W	8.5W	35°C
	32GB RDIMM 4800	NA	NA	35°C

Table 25. GPU Thermal restriction matrix

XE8640			
GPU	Nvidia	H100(4x GPU SKU)	35°C

ⓘ **NOTE:** All configurations support 35°C environment w/o performance degradation.

Initial system setup and configuration

This section describes the tasks for initial setup and configuration of the Dell system. The section also provides general steps to set up the system and the reference guides for detailed information.

Topics:

- Setting up the system
- iDRAC configuration
- Resources to install operating system

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/poweredgemanuals.
3. Connect the peripherals to the system and the system to the electrical outlet.
4. Power on the system.

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

    (i) **NOTE:** For information about managing the basic settings and features of the system, see the Pre-operating system management applications chapter.

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 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 set up iDRAC IP address

To enable communication between your system and iDRAC, you must first configure the network settings based on your network infrastructure. The network settings option is set to **DHCP**, by default.

(i) **NOTE:** For static IP configuration, you must request for the settings at the time of purchase.

You can set up the iDRAC IP address using one of the interfaces in the table below. For information about setting up iDRAC IP address, see the documentation links provided in the table below.

Table 26. Interfaces to set up iDRAC IP address

Interface	Documentation links
iDRAC Settings utility	*Integrated Dell Remote Access Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Integrated Dell Remote Access Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**.

Table 26. Interfaces to set up iDRAC IP address (continued)

Interface	Documentation links
	ⓘ **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article https://www.dell.com/support/article/sln308699.
OpenManage Deployment Toolkit	*Dell OpenManage Deployment Toolkit User's Guide* available at https://www.dell.com/openmanagemanuals > Open Manage Deployment Toolkit.
iDRAC Direct	*Integrated Dell Remote Access Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Integrated Dell Remote Access Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. ⓘ **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article https://www.dell.com/support/article/sln308699.
Lifecycle Controller	*Dell Lifecycle Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Dell Lifecycle Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. ⓘ **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article https://www.dell.com/support/article/sln308699.
Server LCD panel	LCD panel section.
iDRAC Direct and Quick Sync 2 (optional)	*Integrated Dell Remote Access Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Integrated Dell Remote Access Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. ⓘ **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article https://www.dell.com/support/article/sln308699.

ⓘ **NOTE:** To access iDRAC, ensure that you connect the ethernet cable to the iDRAC dedicated network port or use the iDRAC Direct port by using the micro USB (type AB) cable. You can also access iDRAC through the shared LOM mode, if you have opted for a system that has the shared LOM mode enabled.

Options to log in to iDRAC

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

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, the default username is `root` and enter the iDRAC secure default password available on back of the Information Tag. If you opted for legacy password, use the iDRAC legacy username and password - `root` and `calvin`, the iDRAC default password will be blank on the information tag. Then you

will be prompted and required to create a password of your choice before proceeding. You can also log in by using your Single Sign-On or Smart Card.

ⓘ **NOTE:** Ensure that you change the default username 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 https://www.dell.com/support/article/sln308699.

You can also access iDRAC using command-line protocol - RACADM. For more information, see the *Integrated Dell Remote Access Controller RACADM CLI Guide* available at https://www.dell.com/idracmanuals.

You can also access iDRAC using automation tool - Redfish API. For more information, see the *Integrated Dell Remote Access Controller User's Guide Redfish API Guide* available at https://developer.dell.com.

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 provided in the table below. For information about how to install the operating system, see the documentation links provided in the table below.

Table 27. Resources to install the operating system

Resource	Documentation links
iDRAC	*Integrated Dell Remote Access Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Integrated Dell Remote Access Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. ⓘ **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article at https://www.dell.com/support/article/sln308699.
Lifecycle Controller	*Dell Lifecycle Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Dell Lifecycle Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. Dell recommends using Lifecycle Controller to install the OS, since all required drivers are installed on the system. ⓘ **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article at https://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 operating systems supported on PowerEdge systems, see Supported Operating Systems for Dell PowerEdge systems.

Options to download drivers and firmware

You can download firmware from the Dell support site. For information about downloading firmware, 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 below.

Table 28. Options to download firmware

Option	Documentation link
Using Integrated Dell Remote Access Controller Lifecycle Controller (iDRAC with LC)	www.dell.com/idracmanuals

Table 28. Options to download firmware (continued)

Option	Documentation link
Using Dell Repository Manager (DRM)	www.dell.com/openmanagemanuals > Repository Manager
Using Dell Server Update Utility (SUU)	www.dell.com/openmanagemanuals > Server Update Utility
Using Dell OpenManage Deployment Toolkit (DTK)	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Using iDRAC virtual media	www.dell.com/idracmanuals

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 below.

Table 29. Options to download and install OS drivers

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

   ⓘ **NOTE:** If you do not have the Service Tag, 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.

5

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 **Configurations** > **BIOS Settings**.
● Text browser — To enable the text browser, use the Console Redirection.

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

(i) **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 options on the
System Setup Main Menu screen are described in the following table:

Table 30. 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/poweredgemanuals.

Table 30. System Setup Main Menu (continued)

Option	Description
Device Settings	Enables you to configure device settings for devices such as storage controllers or network cards.
Service Tag Settings	Enables you to configure the System Service Tag.

System BIOS

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

Table 31. 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. (i) **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 32. System Information details

Option	Description
System Model Name	Specifies the system model name.

Table 32. System Information details (continued)

Option	Description
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.
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 33. Memory Settings details

Option	Description
System Memory Size	Specifies the size of the system memory.
System Memory Type	Specifies the type of memory installed in the system.
System Memory Speed	Specifies the speed of the system memory.
Video Memory	Specifies the size 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	This field selects the memory operating mode. This feature is active only if a valid memory configuration is detected. When **Optimizer Mode** is enabled, the DRAM controllers operate independently in 64-bit mode and provide optimized memory performance. When **Dell Fault Resilient Mode (FRM)** is enabled, a percentage of the total installed memory is configured to create a fault resilient zone starting from lowest system memory address for use by select hypervisors for host virtualization resilience. Specify the FRM percentage by using the Fault Resilient Mode Memory Size[%] feature. When **Dell NUMA Fault Resilient Mode (FRM)** is enabled, a percentage of the installed memory in every NUMA node is configured to create a fault resilient zone for use by select hypervisors for host virtualization resilience. Specify the FRM percentage by using the Fault Resilient Mode Memory Size[%] feature.
Current State of Memory Operating Mode	Specifies the current state of the memory operating mode.
Node Interleaving	Enables or disables the Node interleaving option. Specifies if the Non-Uniform Memory Architecture (NUMA) is supported. If this field is set to **Enabled**, memory interleaving is supported if a symmetric memory configuration is installed. If the field is set to **Disabled**, the system supports NUMA (asymmetric) memory configurations. This option is set to **Disabled** by default.
Memory training	When option is set to **Fast** and memory configuration is not changed, the system uses previously saved memory training parameters to train the memory subsystems and system boot time is also reduced. If memory configuration is changed, the system automatically enables **Retrain at Next boot** to force one-time full memory training steps, and then go back to **Fast** afterward.

Table 33. Memory Settings details (continued)

Option	Description
	When option is set to **Retrain at Next boot**, the system performs the force one-time full memory training steps at next power on and boot time is slowed on next boot.
	When option is set to **Enable**, the system performs the force full memory training steps on every power on and boot time is slowed on every boot.
DIMM Self Healing (Post Package Repair) on Uncorrectable Memory Error	Enables or disables Post Packing Repair (PPR) on uncorrectable memory error. This option is set to **Enabled** by default.
Correctable Error Logging	Enables or disables correctable error logging. This option is set to **Disabled** by default.
Memory Paging Policy	This field sets the Memory Paging Policy. This option is set to **Closed Paging** by default.
Memory Map Out	This option controls DIMMs slots on the system. This option is set to **Enabled** by default. It allows to disable system installed DIMMs.

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 34. Processor Settings details

Option	Description
Logical Processor	Each processor core supports up to two 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**, **16 GT/s**, **14.4 GT/s**, and **12.8 GT/s**. This option is set to **Maximum data rate** by default. Maximum data rate indicates that the BIOS runs the communication links at the maximum frequency supported by the processors. You can also select specific frequencies that the processors support, which can vary. For best performance, you should select **Maximum data rate**. Any reduction in the communication link frequency affects the performance of non-local memory access and cache coherency traffic. In addition, it can slow access to non-local I/O devices from a particular processor. However, if power saving considerations outweigh performance, reduce the frequency of the processor communication links. Before reducing the frequency, you must localize the memory and I/O access to the nearest NUMA node to minimize the impact to system performance.

Table 34. Processor Settings details (continued)

Option	Description
Virtualization Technology	Enables or disables the virtualization technology for the processor. This option is set to **Enabled** by default.
Kernel DMA Protection	This option is set to **Disabled** by default. When option is set to **Enabled**, BIOS and Operating System will enable direct memory access protection for DMA capable peripheral devices using virtualization technology.
Directory Mode	Enables or disables the directory mode. 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.
DCU Streamer Prefetcher	Enables or disables the Data Cache Unit (DCU) streamer 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.
MADT Core Enumeration	Specifies the MADT Core Enumeration. This option is set to default in **Round Robin**. Linear option supports industry core enumeration whereas, Round Robin option supports Dell optimized core enumeration.
UMA Based Clustering	It is a read-only field and displays as **Quadrant** , when Sub NUMA Cluster is disabled or displays as **Disabled**, when Sub NUMA Cluster is either 2-way or 4-way.
UPI Prefetch	Enables you to get the memory read started early on DDR bus. The Ultra Path Interconnect (UPI) Rx path spawns the speculative memory that is read to Integrated Memory Controller (iMC) directly. This option is set to **Enabled** by default.
XPT Prefetch	This option is set to **Enabled** by default.
LLC Prefetch	Enables or disables the LLC Prefetch on all threads. This option is set to **Enabled** by default.
Dead Line LLC Alloc	Enables or disables the Dead Line LLC Alloc. This option is set to **Enabled** by default. You can enable this option to enter the dead lines in LLC or disable the option to not enter the dead lines in LLC.
Directory AtoS	Enables or disables the Directory AtoS. AtoS optimization reduces remote read latencies for repeat read accesses without intervening writes. This option is set to **Disabled** by default.
AVX P1	Enables you to reconfigure the processor Thermal Design Power (TDP) levels during POST based on the power and thermal delivery capabilities of the system. TDP verifies the maximum heat the cooling system is must dissipate. This option is set to **Normal** by default. ⓘ **NOTE:** This option is only available on certain stock keeping units (SKUs) of the processors.
Intel SST-BF	Enables Intel SST-BF. This option is displayed if Performance Per Watt (operating system) or Custom (when OSPM is enabled)

Table 34. Processor Settings details (continued)

Option	Description
	system profiles are selected. This option is set to **Disabled** by default.
Intel SST-CP	Enables Intel SST-CP. This option is displayed if Performance Per Watt (operating system) or Custom (when OSPM is enabled) system profiles are selected. This option is displayed and selectable for each system profile mode. This option is set to **Disabled** by default.
x2APIC Mode	Enables or disables x2APIC mode. This option is set to **Enabled** by default. ⓘ **NOTE:** For two processors 64 cores configuration, x2APIC mode is not switchable if 256 threads are enabled (BIOS settings: All CCD, cores, and logical processors enabled).
AVX ICCP Pre-Grant License	Enables or disables AVX ICCP Pre-Grant License. This option is set to **Disabled** by default.
Dell Controlled Turbo	
Dell Controlled Turbo Settings	Controls the turbo engagement. Enable this option only when System Profile is set to **Performance** or **Custom**, and CPU Power Management is set to **Performance**. This item can be selected for each system profile mode. This option is set to **Disabled** by default. ⓘ **NOTE:** Depending on the number of installed processors, there might be up to two processor listings.
Dell AVX Scaling Technology	Enables you to configure the Dell AVX scaling technology. This option is set to **0** by default. Enter the value from 0 to 12 bins. The value that is entered decreases the Dell AVX Scaling Technology frequency when the Dell-controlled Turbo feature is enabled.
Number of Cores per Processor	Controls the number of enabled cores in each processor. This option is set to **All** by default.
CPU Physical Address Limit	Limit CPU physical address to 46 bits to support older Hyper-V. If enabled, automatically disables TME-MT. This option is set to **Enabled** by default.
AMP Prefetch	This option enables one of the Mid-Level Cache (MLC) AMP hardware Prefetcher. This option is set to **Disabled** by default.
Homeless Prefetch	This option allows L1 Data Cache Unit (DCU) to prefetech, when the Fill Buffers (FB) is full. Auto maps to hardware default setting. This option is set to **Auto** by default.
Uncore Frequency RAPL	This setting controls whether the Running Average Power Limit (RAPL) balancer is enabled or not. If enabled, it activates the uncore power budgeting. This option is set to **Enabled** by default.
Processor Core Speed	Specifies the maximum core frequency of the processor.
Processor Bus Speed	Specifies the bus speed of the processor. ⓘ **NOTE:** The processor bus speed option displays only when both processors are installed.
Local Machine Check Exception	Enables or disables the local machine check exception. This is an extension of the MCA Recovery mechanism providing the capability to deliver Uncorrected Recoverable (UCR) Software Recoverable Action Required (SRAR) errors to one or more specific logical processors threads receiving previously

Table 34. Processor Settings details (continued)

Option	Description
	poisoned or corrupted data. When enabled, the UCR SRAR Machine Check Exception is delivered only to the affected thread rather than broadcast to all threads in the system. The feature supports operating system recovery for cases of multiple recoverable faults that are detected close, which would otherwise result in a fatal machine check event. The feature is available only on Advanced RAS processors. This option is set to **Enabled** by default.
CPU Crash Log Support	This field controls Intel CPU Crash Log feature for collection of previous crash data from shared SRAM of Out-of -Band Management Service Module at post reset. This option is set to **Disabled** by default.
Processor n	(i) **NOTE:** Depending on the number of processors, there might be up to n processors listed. The following settings are displayed for each processor:

Table 35. 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.
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 36. SATA Settings details

Option	Description
Embedded SATA	Enables the embedded SATA option to be set to **Off**, **AHCI mode** , or **RAID modes**. This option is set to **AHCI Mode** by default. (i) **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 applicable only for AHCI Mode. This option is set to **Disabled** by default.

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.

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

Table 37. NVMe Settings details

Option	Description
NVMe mode	Enables or disables the boot mode. The option is set to **Non-RAID** mode by default.
BIOS NVMe Driver	Sets the drive type to boot the NVMe driver. The available options are **Dell Qualified Drives** and **All Drives**. This option is set to **Dell Qualified Drives** 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. The **Boot Settings** only support **UEFI** mode.

- **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.

    (i) **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 38. 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.** (i) **NOTE:** Setting this field to UEFI disables the **BIOS Boot Settings** menu.
Boot Sequence Retry	Enables or disables the Boot sequence retry feature or resets the system. When this option is set to **Enabled** and the system fails to boot, the system re-attempts the boot sequence after 30 seconds. When this option is set to **Reset** and the system fails to boot, the system reboots immediately. 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.
Hard-disk Drive Placeholder	Enables or disables the Hard-disk drive placeholder. This option is set to **Disabled** by default.
Clean all Sysprep variables and order	When this option is set to **None**, BIOS will do nothing. When set to **Yes**, BIOS will delete variables of SysPrep #### and SysPrepOrder this option is a onetime option, will reset to none when deleting variables. This setting is only available in **UEFI Boot Mode**. This option is set to **None** by default.

Table 38. Boot Settings details (continued)

Option	Description
UEFI Boot Settings	Specifies the UEFI boot sequence. Enables or disables UEFI Boot options. ⓘ **NOTE:** This option controls the UEFI boot order. The first option in the list will be attempted first.

Table 39. 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 40. Network Settings details

Option	Description
UEFI PXE Settings	Enables you to control the configuration of the UEFI PXE device.
Number of PXE Devices	This field specifies the number of PXE devices. This option is set to **4** by default.
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.
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.
UEFI NVMe-oF Settings	Enables you to control the configuration of the NVMe-oF devices.
NVMe-oF	Enables or disables the NVMe-oF feature. When enabled, it allows to configure the host and target parameters needed for fabric connection. This is set to **Disabled** by default.
NVMe-oF Host NQN	This field specifies the name of the NVMe-oF host NQN. Allowed input is in the following format: nqn.yyyy-mm.<Reserved Domain Name>:<Unique String>. Leave it empty to use system generated value with following format: nqn.1988-11.com.dell:<Model name>.<Model number>.<Service Tag>.
NVMe-oF Host Id	This field specifies a 16 bytes value of the NVMe-oF host identifier that uniquely identifies this host with the controller in the NVM subsystem. Allowed input is a hexadecimal-encoded string in this format: 00112233-4455-6677-8899-aabbccddeeff. Leave it empty to use system generated value. A value of all FF is not allowed.
Host Security Key Path	This field specifies the Host security key path.
NVMe-oF SubSystem Settings	This field controls the parameters for the NVMe-oF subsystem n connections.

Table 41. 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 **Enabled** or **Disabled**. This option is set to **Disabled** by default.
Vlan ID	Shows the Vlan ID for the PXE device
Vlan Priority	Shows the Vlan Priority for the PXE device.

Table 42. 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 **Enabled** by default.
IP Address	Specifies IP address for the HTTP device.
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 **Enabled** 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
TLS Authentication Configuration	Specifies the option for TLS authentication configuration.

Table 43. ISCSI Device1 Settings screen details

Option	Description
Connection 1	Enables or disables the iSCSI connection. This option is set to **Disabled** by default.
Connection 2	Enables or disables the iSCSI connection. This option is set to **Disabled** 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.

Table 44. TLS Authentication Configuration screen details

Option	Description
TLS Authentication Mode	View or modify the device's boot TLS Authentication Mode. This option is set to **One Way** by default. **None** means the HTTP server and the client will not authenticate each other for this boot.
Root Certificate Configuration	Import, delete, or export the root certificate.

Table 45. NVMe-oF SubSystem Settings screen details

Option	Description
NVMe-oF SubSystem n (n = 1 to 4)	Enables or disables NVMe-oF SubSystem. This option is set to **Disabled** by default.
NVMe-oF SubSystem n Settings (n = 1 to 4)	Enables you to control the configuration of the NVMe-oF SubSystem, if **Enabled**.

Table 46. NVMe-oF SubSystem n Settings

Option	Description
Interface	NIC interface used for NVMe-oF connections. This option is set to **Embedded NIC 1 Port 1 Partition 1** by default.
Transport Type	This field sets the value of transport type for NVMe-oF connection. This option is set to **TCP** by default.
Protocol	This field sets the value of protocol type for NVMe-oF connection. This option is set to **IPv4** by default.
VLAN	Enables or disables VLAN for this NVMe-oF connections. This option is set to **Disabled** by default.
VLAN Id	Specifies the VLAN Id for this NVMe-oF connection. This option is set to **1** by default.
VLAN Priority	Specifies the VLAN priority for this NVMe-oF connection. This option is set to **0** by default.
Retry Count	Specifies the retry count for this NVMe-oF connection. This option is set to **3** by default.
Timeout	Specifies the time out for this NVMe-oF connection. This option is set to **10000** by default.
DHCP	Enables and disables the DHCP for this NVMe-oF connection. This option is set to **Disabled** by default.
Host IP Address	Specifies the Host IP Address for this NVMe-oF connection.
Host Subnet Mask	Specifies the Host Subnet Mask for this NVMe-oF connection.
Host Gateway	Specifies the Host Gateway for this NVMe-oF connection.
NVMe-oF subsystem info via DHCP	Enables and disables the NVMe-oF subsystem's DHCP for this connection. This option is set to **Disabled** by default.
NVMe-oF subsystem NQN	Specifies the NVMe-oF subsystem's NQN for this connection.
NVMe-oF subsystem Address	Specifies the NVMe-oF subsystem's IP address for this connection.
NVMe-oF subsystem Port	Specifies the NVMe-oF subsystem's port for this connection. This option is set to **4420** by default.
NVMe-oF subsystem NID	Specifies the NamespaceID (NID) for this NVMe-oF connection.
NVMe-oF subsystem Controller ID	Specifies the NVMe-oF subsystem's Controller ID for this connection. This option is set to **0** by default.
Security	Enables or disables the security option for this NVMe-oF connection. This option is set to **Disabled** by default.
Authentication Type	Specifies the authentication type for this NVMe-oF connection. This option is set to **None** by default.
Securitykeypath	Specifies the Securitykeypath for this NVMe-oF connection.

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 47. 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

Table 47. Integrated Devices details (continued)

Option	Description
	back USB ports.; selecting **All Ports Off (Dynamic)** disables all front and back USB ports during POST. and front ports can be enabled or disabled dynamically by authorized user without resetting the system. 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.
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.
Integrated Network Card1	Enables or disables the integrated network card. When this option is set to **Enabled**, the card is not available to the operating system. This option is set to **On** by default. ⓘ **NOTE:** If set to Disabled (operating system), the Integrated NICs might still be available for shared network access by iDRAC.
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 is used as the primary display. BIOS will output displays to both the primary add-in video and the embedded video during POST and preboot 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 rearrange the cards in the slots in order to control which card is the primary video.
I/O Snoop HoldOff Response	Selects the number of cycles PCI I/O can withhold snoop requests, from the CPU, to allow time to complete its own write to LLC. This setting can help improve performance on workloads where throughput and latency are critical. The options available are **256 Cycles**, **512 Cycles**, **1K Cycles**, **2K Cycles**, **4K Cycles**, **8K Cycles**, **16K Cycles**, **32K Cycles**, **64K Cycles** and **128K Cycles**.This option is set to **2K Cycles** by default.
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**.
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.
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 operating system. This option is set to **Disabled** by default.

Table 47. Integrated Devices details (continued)

Option	Description
Slot Disablement	Enables or boot driver 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. When this option is set to boot driver disabled, both the Option ROM and UEFI driver from the slot will not run during POST. The system will not boot from the card and its pre-boot services will not be available. However, the card is available to the operating system.
	Slot n: Enables or only the boot driver is disabled for the PCIe slot n. This option is set to **Enabled** by default.
Slot Bifurcation	**Auto Discovery Bifurcation Settings** allows **Platform Default Bifurcation**, **Auto Discovery of Bifurcation**, and **Manual bifurcation Control**.
	This option is set to **Platform Default Bifurcation** by default. The slot bifurcation field is accessible when set to **Manual bifurcation Control** and is grayed out when set to **Platform Default Bifurcation** and **Auto Discovery of Bifurcation**. ⓘ **NOTE:** The slot bifurcation supports on PCIe slot only, does not support slot type from Paddle card to Riser and Slimline connector to Riser.

Serial Communication

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

ⓘ **NOTE:** The serial port is optional for the PowerEdge XE8640 system. The Serial Communication option is applicable only if the serial COM port is installed in the system.

Table 48. Serial Communication details

Option	Description
Serial Communication	Enables the serial communication options. 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.
	The options available for System without serial COM port (DB9) are **On without Console Redirection**, **On with Console Redirection**, **Off**, **Auto**. This option is set to **Auto** by default.
Serial Port Address	Enables you to set the port address for serial devices. This option is set to either **COM1** or **COM2** for the serial device **(COM1=0x3F8,COM2=0x2F8)** and set to **COM1** by default. ⓘ **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.

Table 48. Serial Communication details (continued)

Option	Description
	(i) **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. (i) **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 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 49. System Profile Settings details

Option	Description
System Profile	Sets the system profile. If you set the System Profile option to a mode other than **Performance Per Watt (DAPC)**, 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 (DAPC)** by default. Other options include **Custom**, **Performance**, **Performance Per Watt (OS)** and **Workstation Performnce**. (i) **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 **System DBPM (DAPC)** by default. Other option includes **Maximum Performance**, **OS DBPM**.
Memory Frequency	Sets the speed of the system memory. You can select **Maximum Performance**, **Maximum Reliability** 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.
Enery Efficient Turbo	Energy Efficient Turbo (EET) is a mode of operation where a processor's core frequency is adjusted within the turbo range based on workload. 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.
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.

Table 49. System Profile Settings details (continued)

Option	Description
Uncore Frequency	Enables you to select the **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.
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.
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 when System Profile is set to **Custom**. ⓘ **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.
Workload Profile	This option allows the user to specify the targeted workload of a server. It allows optimization of performance based on the workload type. This option is set to **Not Configured** by default.
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 50. 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.
TPM Information	Indicates the type of Trusted Platform Module, if present.

Table 51. TPM 2.0 security information

Option	Description
TPM Information	
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. When set to Off, the presence of the TPM is not reported to the OS. When set to On, the presence of the TPM is reported to the OS. The **TPM Security** option is set to **Off** by default.
	When TPM 2.0 is installed, the **TPM Security** option is set to **On** or **Off**. This option is set to **Off** by default.

Table 51. TPM 2.0 security information (continued)

Option	Description
TPM Information	Indicates the type of Trusted Platform Module, if present.
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**.
TPM Advanced Settings	Specifies TPM Advanced Settings details.

Table 52. 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. It is set **On** for Secure Launch (Firmware Protection) support on Windows 2022.
Memory Encryption	Enables or disables the Intel Total Memory Encryption (TME) and Multi-Tenant (Intel® TME-MT). When option is set to **Disabled**, BIOS disables both TME and MK-TME technology. When option is set to **Single Key** BIOS enables the TME technology. When option is set to **Multiple Keys**, BIOS enables the TME-MT technology. This option is set to **Disabled** by default.
TME Encryption Bypass	Allows the option to bypass the Intel Total Memory Encryption. This option is set to **Disabled** by default.
Intel(R) SGX	Enables you to set the Intel Software Guard Extension (SGX) option. To enable the **Intel SGX** option, processor must be SGX capable, memory population must be compatible (minimum x8 identical DIMM1 to DIMM8 per CPU socket, not support on persistent memory configuration), memory operating mode must be set at optimizer mode, memory encryption must be enabled and node interleaving must be disabled. This option is set to **Off** by default. When this option is to **Off**, BIOS disables the SGX technology. When this option is to **On**, BIOS enables the SGX technology.
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. ⓘ **NOTE:** The host system will not power on up until iDRAC Root of Trust (RoT) is completed, host power on will be delayed by minimum 90 seconds after the AC applied.
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. When this option is set to **Immediate**, there is no delay for power up. When this option is set to **Random**, the system creates a random delay for power up. When this option is set to **User Defined**, the system delay time is manually to power up.
User Defined Delay (120 s to 600 s)	Sets the **User Defined Delay** option when the **User Defined** option for **AC Power Recovery Delay** is selected. The actual AC recovery time needs to add iDRAC root of trust time (around 50 seconds).
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.

Table 52. System Security details (continued)

Option	Description
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.
SMM Security Migration	Enables or disables the UEFI SMM security migration protections. It is set to **Disabled** by default.
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**.
	Below are the details of different boot modes available in the **Secure Boot Mode** option. <table><tr><td>**User Mode**</td><td>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.</td></tr><tr><td>**Audit mode**</td><td>In **Audit Mode**, PK is not present. BIOS does not authenticate programmatic update 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.</td></tr><tr><td>**Deployed Mode**</td><td>**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.</td></tr></table>
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.

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 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.
   > (i) **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.

> (i) **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

> (i) **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.
```

Even after you power 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 53. Redundant OS Control details

Option	Description
Redundant OS Location	Enables you to select a backup disk from the following devices: - **None** - **BOSS PCIe Cards (Internal M.2 Drives)**
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**. 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 **Disabled** 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 54. 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.
Time Zone	Enables you to select required Time Zone.

Table 54. Miscellaneous Settings details (continued)

Option	Description
Daylight Savings Time	Enables or disables Daylight Savings Time. This option is set to **Disabled** by default.
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	This option determines whether th system BIOS will load legacy video (INT 10h) option ROM from the video controller. This option is set to **Disabled** by default. ⓘ **NOTE:** This option cannot be set to Enabled, when the Boot mode is UEFI and Secure Boot is enabled.
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

The iDRAC settings 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.

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

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

Device Settings

Device Settings enables you to configure device parameters such as storage controllers or network cards.

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 https://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 55. 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 UEFI 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.

Minimum to POST and system management configuration validation

This section describes the minimum to POST system requirement and system management configuration validation of the Dell system.

Topics:

*   Minimum configuration to POST
*   Configuration validation

Minimum configuration to POST

The components mentioned below are the minimum configuration to POST:

● Power button control panel and cable
● Power Distribution Board(PDB) and cables
● PCIe Switch Board(PSB) and cables
● Two processors in processor socket 1 and 2
● Two memory modules(DIMMs) in slot A1 and B1
● System Board+RIO Card
● One 2800W PSU(54V) and 54V PSU power cord

Configuration validation

The new generation of Dell systems have added interconnect flexibility and advanced iDRAC management features to collect precise system configuration information and report configuration errors.

When the system is powered on, information about installed cables, risers, backplanes, power supplies, floating card (fPERCadapter PERC , BOSS), and processor is obtained from the CPLD and backplane memory maps are analyzed. This information forms a unique configuration, which is compared with one of the qualified configurations that are stored in a table maintained by iDRAC.

One or more sensors are assigned to each of the configuration elements. During POST, any configuration validation error is logged in the System Event Log (SEL)/LifeCycle (LC) log. The reported events are categorized in the configuration validation error table.

Table 56. Configuration validation error

Error	Description	Possible cause and recommendations	Example
Config Error	A configuration element within the closest match contains something that is unexpected and does not match any Dell qualified configuration.	Wrong configuration	Config Error: Backplane cable CTRS_SRC_SA1 and BP-DST_SA1
		The element reported in HWC8010 errors are assembled incorrectly. Verify element (cable, risers, etc) placement in the system.	Config Error : SL Cable PLANAR_SL7 and CTRL_DST_PA1
Config Missing	iDRAC found a configuration element missing within the closest match detected.	Missing or damaged cable, device, or part	Config Missing: Float card front PERC/HBAadapter PERC/HBA

Table 56. Configuration validation error (continued)

Error	Description	Possible cause and recommendations	Example
		Missing element or cable is reported in HWC8010 error logs. Install the missing element (cable, risers, etc).	Config Missing : SL cable PLANAR_SL8 and CTRL_DST_PA1
Comm Error	A configuration element is not responding to iDRAC using the management interface while running an inventory check.	System management sideband communication	Comm Error: Backplane 2
		Unplug AC Power, reseat the element and replace the element if the problem persists.	

Installing and removing system components

Topics:

Safety instructions

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

⚠ **CAUTION: Ensure that two or more people lift the system horizontally from the box and place it on a flat surface, rack lift, or into the rails.**

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

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

⚠ **CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or**

telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

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

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

ⓘ **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 updating to the latest firmware and changing the configuration, see the *Lifecycle Controller User's Guide* at https://www.dell.com/idracmanuals.

ⓘ **NOTE:** While replacing faulty storage controller, FC, or 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 updating to the latest firmware and changing the configuration, see the *Lifecycle Controller User's Guide* at https://www.dell.com/idracmanuals.

Before working inside your system

Prerequisites

Follow the safety guidelines listed in the Safety instructions.

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/poweredgemanuals.
4. Remove the system cover.

After working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions.

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 system at www.dell.com/poweredgemanuals.
3. Reconnect the peripherals and connect the system to the electrical outlet, and then power on the system.

Recommended tools

You may need some or all of 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 T30 screwdriver
- Torx T15 screwdriver
- 5 mm hex nut screwdriver
- Plastic scribe
- 1/4-inch flat blade screwdriver

- Wrist grounding strap connected to the ground
- ESD mat
- Needle-nose pliers

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

- AMP 90871-1 hand-crimping tool or equivalent
- Tyco Electronics 58433-3 or equivalent
- Wire-stripper pliers to remove insulation from size 10 AWG solid or stranded, insulated copper wire
  - (i) **NOTE:** Use alpha wire part number 3080 or equivalent (65/30 stranding).

Optional front bezel

(i) **NOTE:** LCD panel is optional on the front bezel. If the front bezel has an LCD panel, see LCD panel section.

Removing the front bezel

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

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Keep the bezel key handy.
   - (i) **NOTE:** The bezel key is part of the LCD bezel package.

Steps

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

Figure 16. Removing the front bezel with the LCD panel

Next steps

Replace front bezel.

Installing the front bezel

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

Prerequisites

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

   (i) **NOTE:** The bezel key is part of the LCD bezel package.

Steps

1. Align and insert the tabs on the bezel into the slots on the system, press the bezel until the release button clicks in place.
2. Lock the bezel.
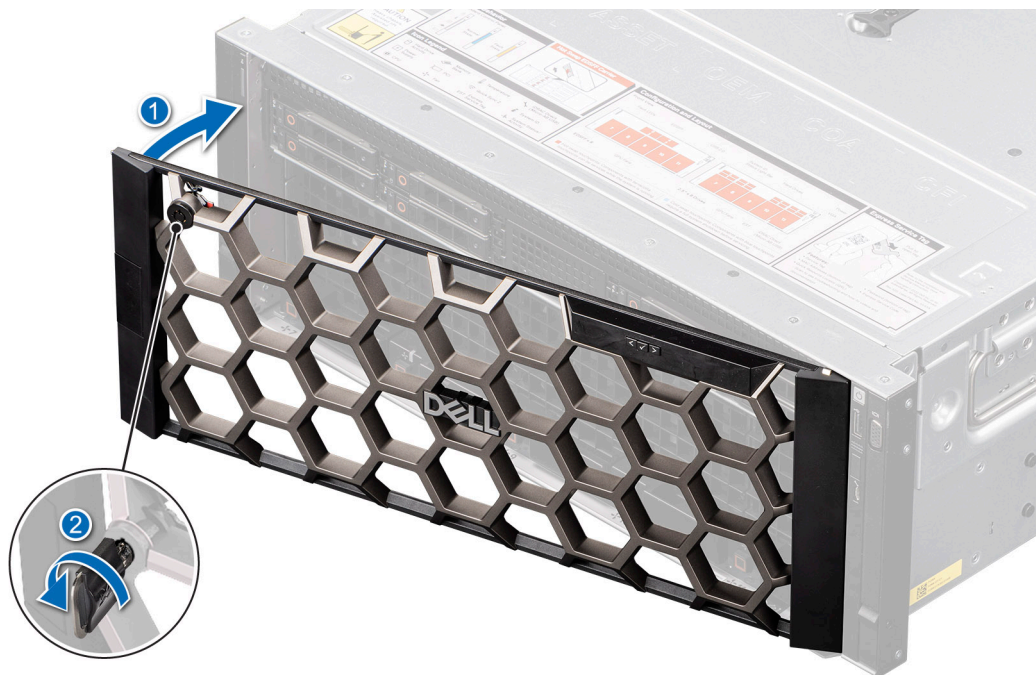
Figure 17. Installing the front bezel with the LCD panel

GPU fan

Removing the GPU fan

Prerequisites

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

Steps

Press the release button on the GPU fan and slide the GPU fan out of the system.
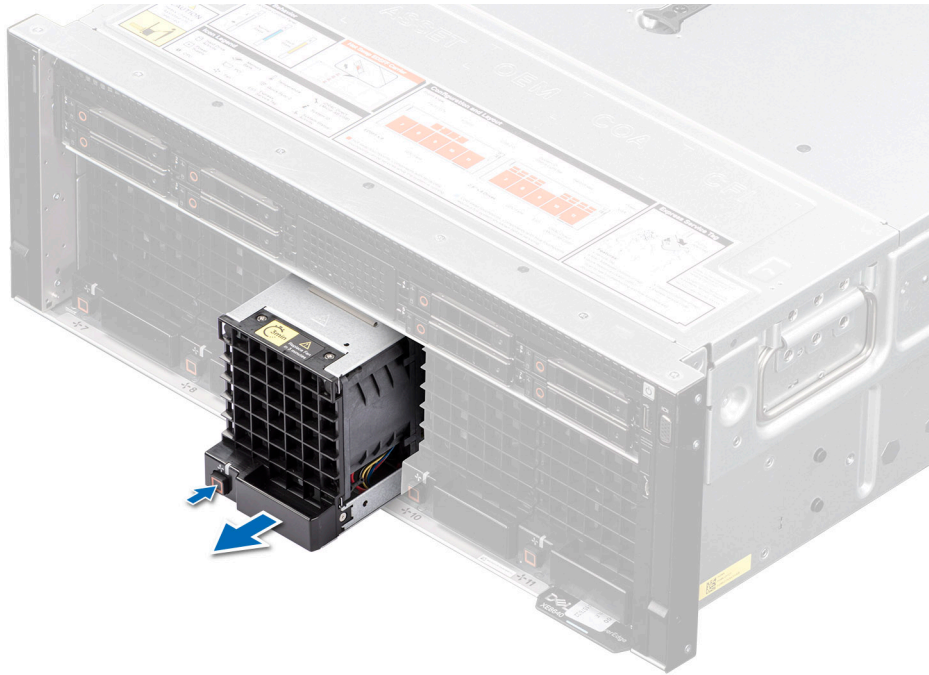
Figure 18. Removing a GPU fan

Next steps

Replace the GPU fan.

Installing the GPU fan

Prerequisites

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

Steps

Align and slide the GPU fan into the GPU fan slot, until the GPU fan clicks into place.
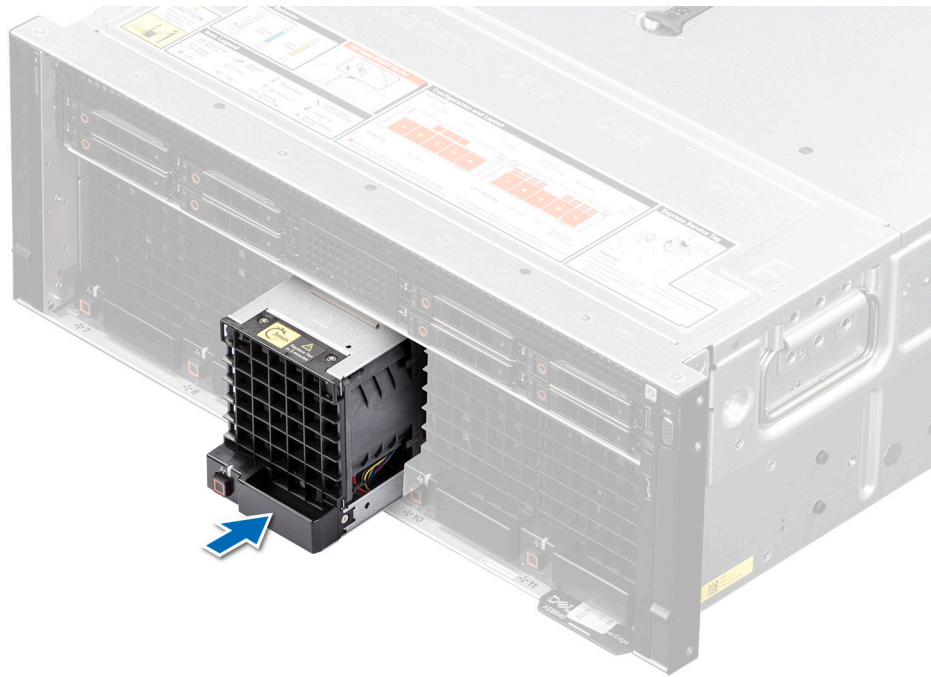
Figure 19. Installing a GPU fan

Next steps

If removed, install the front bezel.

System cover

Removing the system cover

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Power off the system, and any attached peripherals.
3. Disconnect the system from the electrical outlet and peripherals.

Steps

1. Using a 1/4-inch flat head or a Phillips 2 screwdriver, rotate the lock counterclockwise to the unlock position.
2. Lift the release latch until the system cover slides back.
3. Lift the cover from the system.

Figure 20. Removing the system cover

Next steps

1. Replace the system cover.

Installing the system cover

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Ensure that all internal cables are connected and routed properly, and no tools or extra parts are left inside the system.

Steps

1. Align the tabs on the system cover with the guide slots on the system and slide the system cover.
2. Close the system cover release latch.

   (i) **NOTE:** Ensure that the system cover closes without obstruction or unnecessary force. Reseat any cables or components or realign the system cover if necessary.

3. Using a 1/4-inch flat head or Phillips 2 screwdriver, rotate the lock clockwise to the lock position.

Figure 21. Installing the system cover

Next steps

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

Front top cover

Removing the front top cover

Prerequisites

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

Steps

1. Slide the front top cover in the direction of the arrows marked on the front top cover.
2. Lift the front top cover from the system.
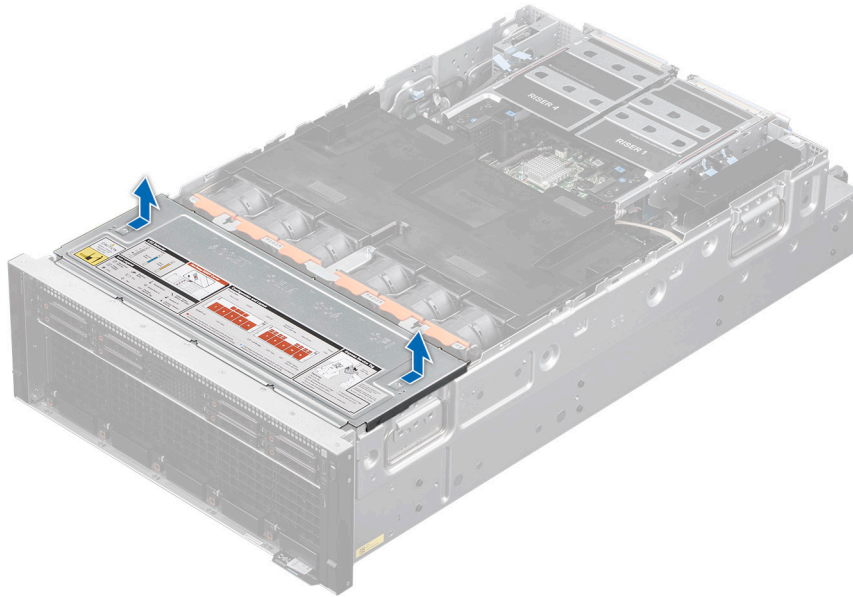
Figure 22. Removing the front top cover

Next steps

1. Replace the front top cover.

Installing the front top cover

Prerequisites

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

Steps

1. Align the front top cover with the guide slots on the system.
2. Slide the front top cover to the front of the system until the front top cover fits into place.
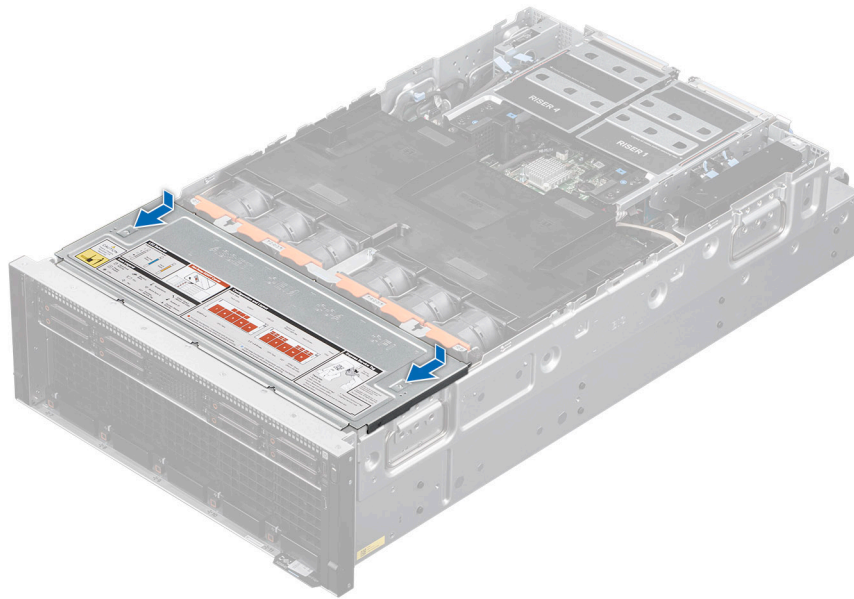
Figure 23. Installing the front top cover

Next steps

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

Air shroud

Removing the air shroud

Prerequisites

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

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

Steps

1. Press the release tab on both side of the air shroud.
2. Lift the air shroud from the system.
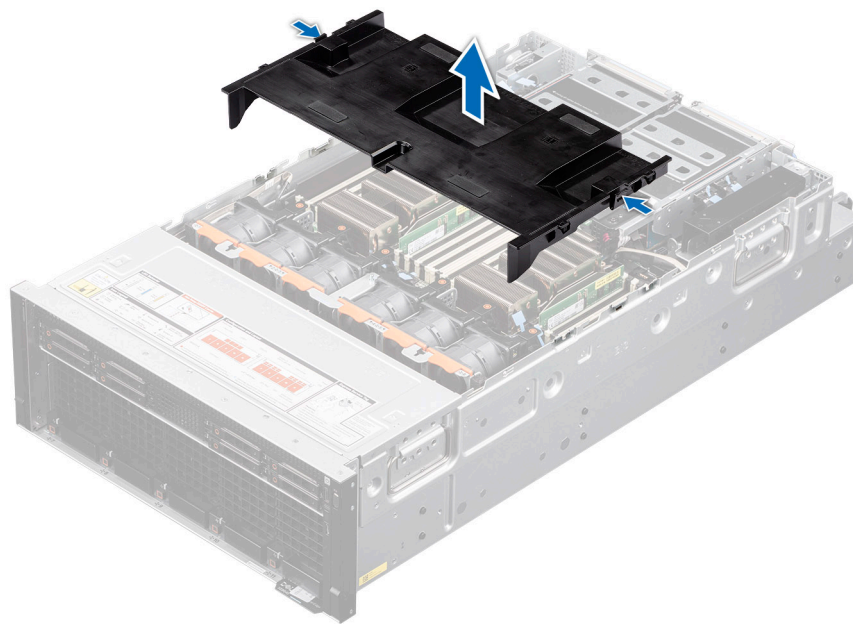
Figure 24. Removing the air shroud

Next steps

1. 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.

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.
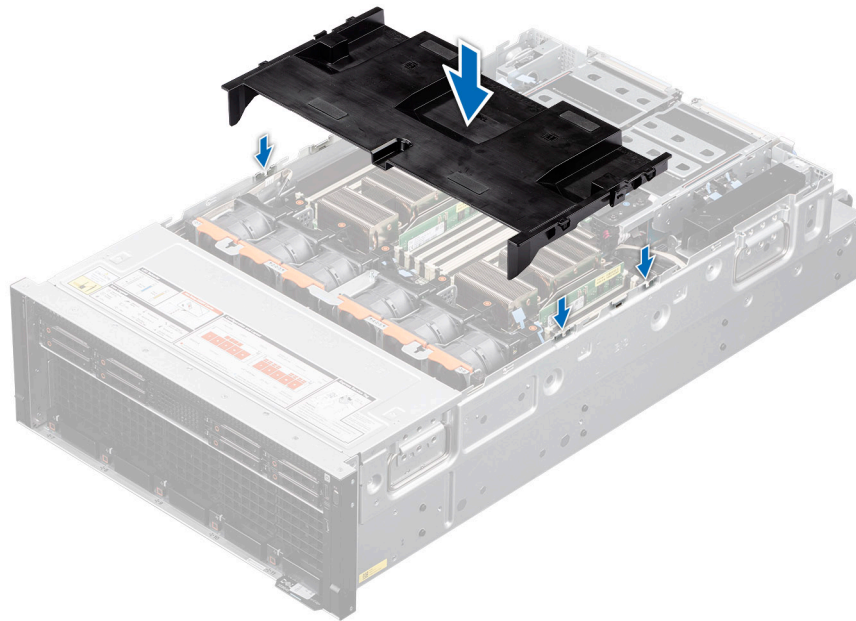
Figure 25. Installing the air shroud

Next steps

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

Drives

Removing a drive blank

Prerequisites

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

⚠ **CAUTION: To maintain 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.
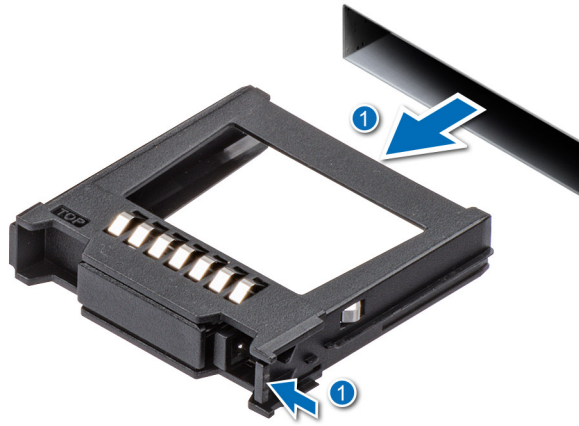
Figure 26. Removing a drive blank

Next steps

1. Replace the drive blank.

Installing a drive blank

Prerequisites

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

Steps

Slide the drive blank into the drive slot until the release button clicks into place.
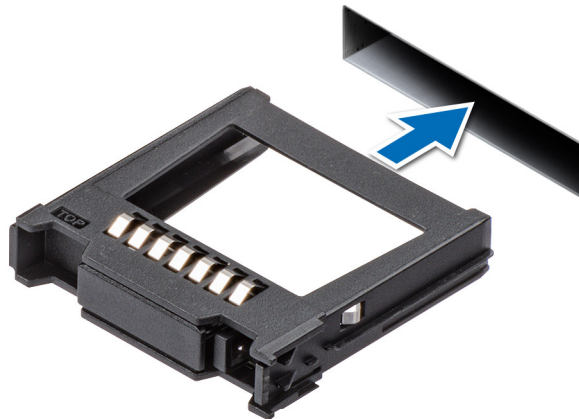
Figure 27. Installing a drive blank

Next steps

1. If removed, install the front bezel.

Removing a drive carrier

Prerequisites

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

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

> ⚠️ **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.

> ⓘ **NOTE:** If you are not replacing the drive immediately, install a drive blank in the empty drive slot to maintain proper system cooling.

Figure 28. Removing a drive carrier

Next steps

Replace the drive or a drive blank.

Installing the drive carrier

Prerequisites

> ⚠️ **CAUTION: Before removing or installing a drive while the system is running, see the www.dell.com/ storagecontrollermanuals 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.**

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

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

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

1. Follow the safety guidelines listed in the Safety instructions.
2. 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 and push until the drive connects with the backplane.
2. Close the drive carrier release handle to lock the drive in place.
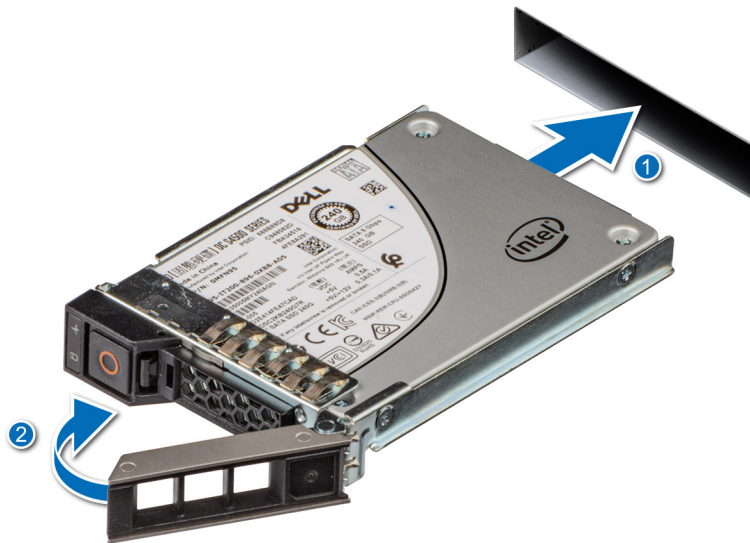
Figure 29. Installing a drive carrier

Next steps

install the front bezel.

Removing the drive from the drive carrier

Prerequisites

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

Steps

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

   ⓘ **NOTE:** If the drive carrier has Torx screw, use Torx 6 (for 2.5-inch drive) screwdriver to remove the drive.

2. Lift the drive out of the drive carrier.
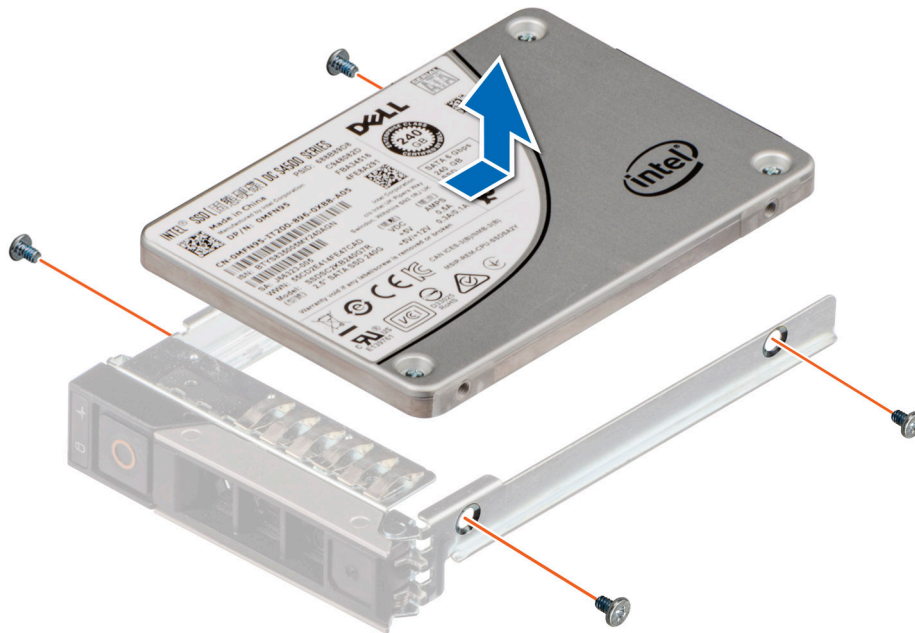
Figure 30. Removing the drive from the drive carrier

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. Remove the drive blank.

Steps

1. Insert the drive into the drive carrier with the drive connector facing toward 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 lbf-in.

   ⓘ **NOTE:** If the drive carrier has Torx screw, use Torx 6 (for 2.5-inch drive) screwdriver to install the drive.
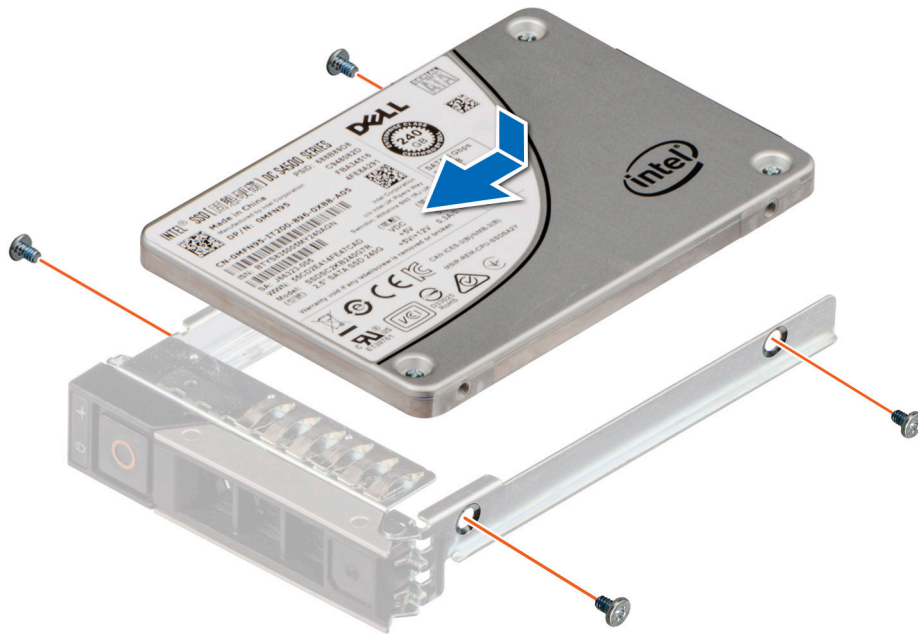
Figure 31. Installing a drive into the drive carrier

Next steps

1. Install the drive carrier.

Removing an EDSFF E3.S drive blank

Prerequisites

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

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

Steps

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

Figure 32. Removing an EDSFF E3.S drive blank

Next steps

1. Replace the EDSFF E3.S drive blank.

Installing an EDSFF E3.S drive blank

Prerequisites

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

Steps

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

Figure 33. Installing an EDSFF E3.S drive blank

Next steps

1. If removed, install the front bezel.

Removing an EDSFF E3.S drive from the drive carrier

Prerequisites

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

Steps

1. Using a Torx 6 screwdriver, remove the screws from the slide rails on the drive carrier.

2. Lift the drive out of the drive carrier.
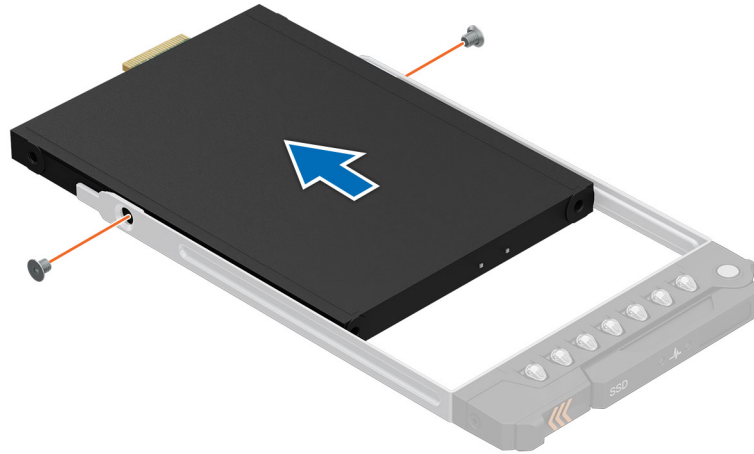
Figure 34. Removing an EDSFF E3.S drive from the drive carrier

Next steps

Install an EDSFF E3.S drive into the drive carrier.

Installing an EDSFF E3.S drive into the drive carrier

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Remove an EDSFF E3.S drive blank or Remove an EDSFF E3.S drive carrier.

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 Torx 6 screwdriver, secure the drive to the drive carrier with the screws.

   (i) **NOTE:** When installing a drive into the drive carrier, ensure that the screws are torqued to 4 in-lbs.
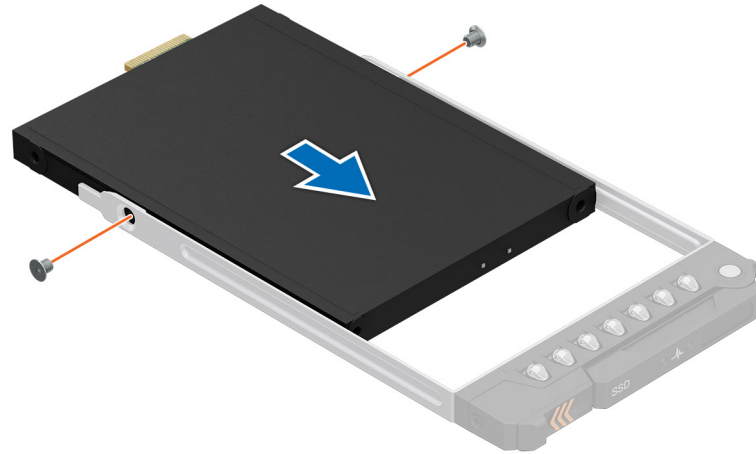
Figure 35. Installing an EDSFF E3.S drive into the drive carrier

Next steps

1. Install the drive carrier.

Removing an EDSFF E3.S drive carrier

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Remove the front bezel.
3. Using the management software, prepare the drive for removal. If the drive is online, the green activity or fault indicator flashes while the drive is turning off. When the drive indicators are off, the drive is ready for removal. For more information, see the storage controller documentation.

   ⚠ **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. Lift 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.

   ⓘ **NOTE:** If you are not replacing the drive immediately, install an EDSFF E3.S drive blank in the empty drive slot to maintain proper system cooling.
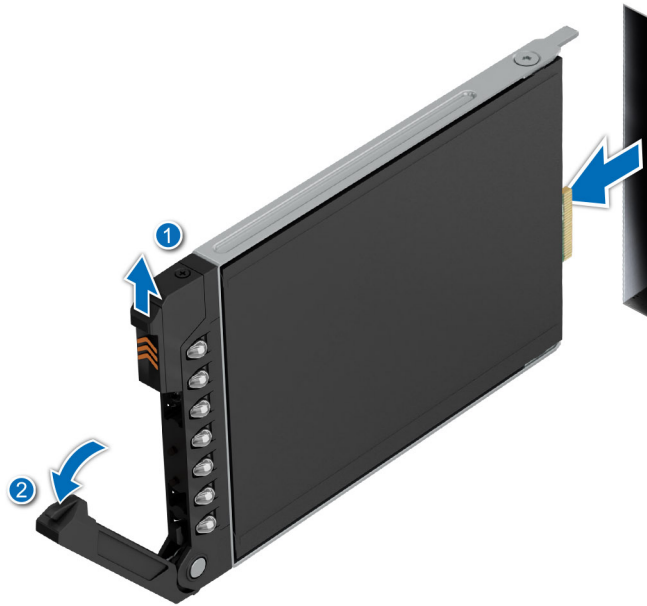
Figure 36. Removing an EDSFF E3.S drive carrier

Next steps

Replace the EDSFF E3.S drive or an EDSFF E3.S drive blank.

Installing an EDSFF E3.S drive carrier

Prerequisites

⚠ **CAUTION: Before removing or installing a drive while the system is running, see the www.dell.com/ storagecontrollermanuals 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.**

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

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

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

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

Steps

1. Slide the drive carrier into the drive slot and push until the drive connects with the backplane.
2. Close the drive carrier release handle to lock the drive in place.
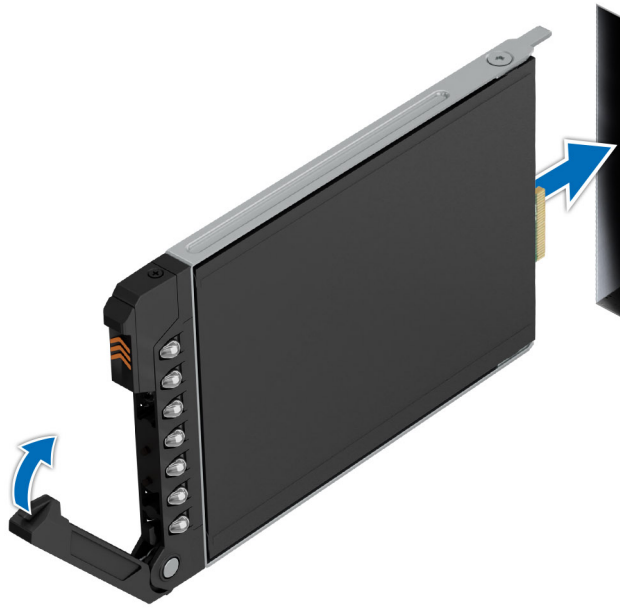
Figure 37. Installing an EDSFF E3.S drive carrier

Next steps

Install the front bezel.

Drive backplane

This is a service technician replaceable part only.

Drive backplane

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

Table 57. Supported backplane options

System	Supported hard drives options
PowerEdge XE8640	2.5-inch (x 8) NVMe backplane

Figure 38. 8 x 2.5-inch NVMe drive backplane

1. BP_ DST_PB2 (PCIe/NVMe connector)
2. BP_DST_SB1 (PERC to backplane)
3. BP_DST_PA2 (PCIe/NVMe connector)
4. BP_PWR_1 (backplane power and signal cable to system board)
5. BP_DST_PB1 (PCIe/NVMe connector)
6. BP_DST_SA1 (PERC to backplane)
7. BP_PWR_CTRL
8. BP_DST_PA1 (PCIe/NVMe connector)
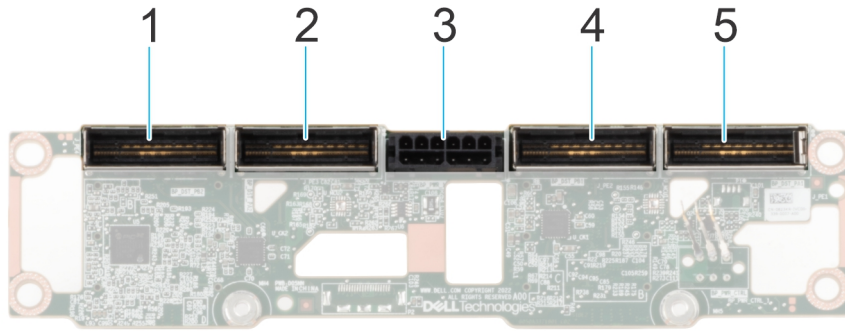
Figure 39. E3.S NVMe Gen5 backplane

1. BP_ DST_PB2 (PCIe/NVMe connector)
2. BP_DST_PA2 (PCIe/NVMe connector)
3. BP_PWR_1 (backplane power and signal cable to system board)
4. BP_DST_PB1 (PCIe/NVMe connector)
5. BP_DST_PA1 (PCIe/NVMe connector)

Removing the drive 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 instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the front top cover.
4. Remove the drives.
5. Observe and disconnect the drive backplane cables from the connector on the system board and backplane.

Steps

1. Press the blue release tab to disengage the drive backplane from the hooks on the system.
2. Lift and pull the drive backplane out of the system.

    ⓘ **NOTE:** To avoid damaging the backplane, remove the disconnected backplane cables from the cable routing clips before removing the backplane.
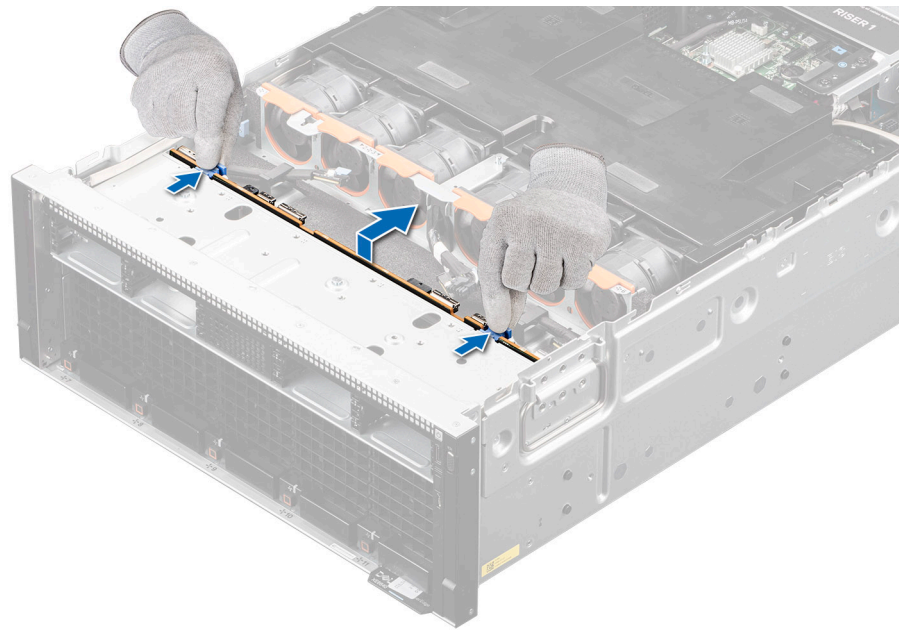
Figure 40. Removing the drive backplane

Next steps

1. 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 the front top cover.
4. Remove the drives.
5. Observe and disconnect the drive backplane cables from the connector on the system board and backplane.

ⓘ **NOTE:** To avoid damaging the backplane, remove the disconnected backplane cables from the cable routing clips.

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

Steps

1. Align the slots on the drive backplane with the guides on the system.
2. Slide the drive backplane into the guides and lower the backplane until the blue release tab clicks into place.
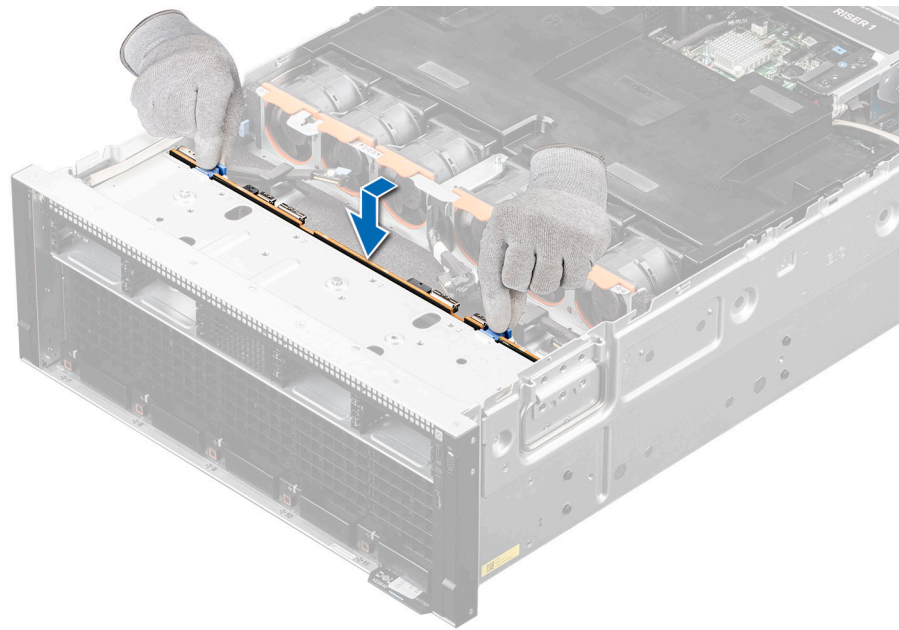
Figure 41. Installing the drive backplane

Next steps

1. Connect the drive backplane cables to the connectors on the system board and backplane.
2. Install the drives.
3. Install the front top cover.
4. Follow the procedure listed in After working inside your system.

Removing the EDSFF E3.S 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 instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the front top cover.
4. Remove the drives.
5. Observe and disconnect the drive backplane cables from the connector on the system board and backplane.

Steps

1. Using a Phillips #2 screwdriver, loosen the captive screw on the EDSFF E3.S backplane module.
2. Lift and pull the drive backplane out of the system.
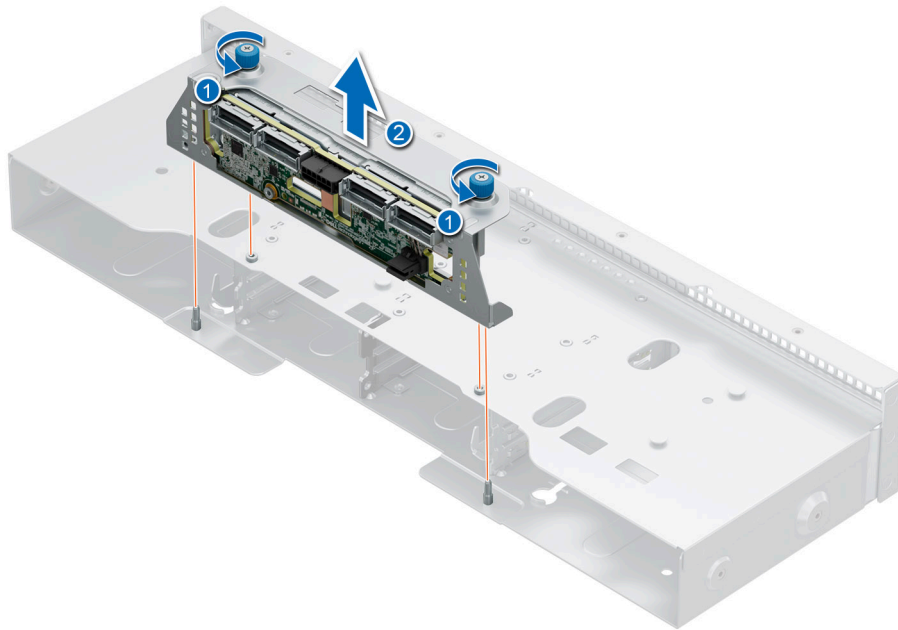
Figure 42. Removing the EDSFF E3.S backplane module

Next steps

1. Replace the EDSFF E3.S backplane module.

Installing the EDSFF E3.S 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 the front top cover.
4. Remove the drives.
5. Observe and disconnect the drive backplane cables from the connector on the system board and backplane.

ⓘ **NOTE:** To avoid damaging the backplane, remove the disconnected backplane cables from the cable routing clips.

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

Steps

1. Align the guides on the EDSFF E3.S backplane module with the slots on the system.
2. Slide the EDSFF E3.S backplane module towards the rear of the system, until it is firmly secured.
3. Using a Phillips #2 screwdriver, tighten the captive screw on the EDSFF E3.S backplane module.
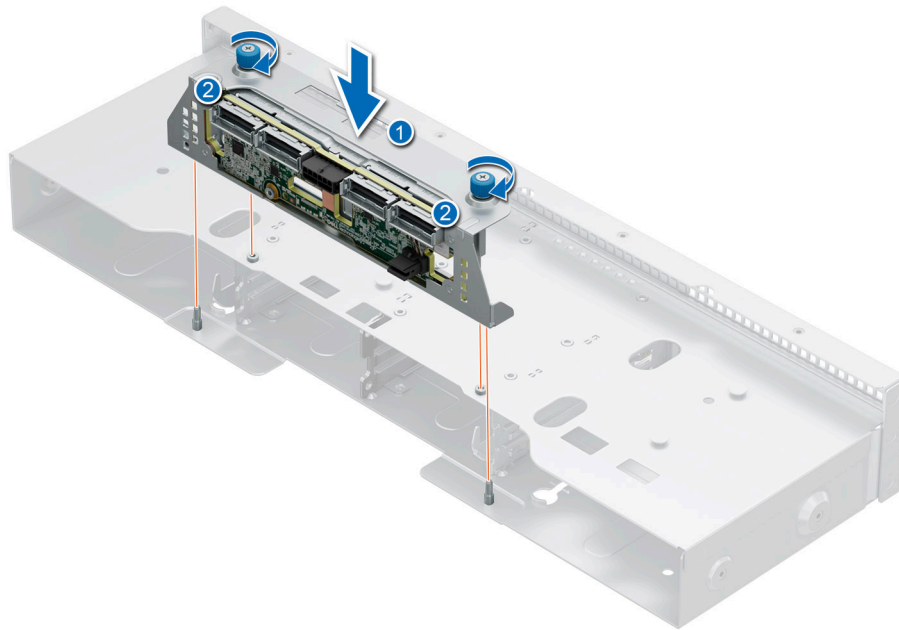
Figure 43. Installing the EDSFF E3.S backplane module

Next steps

1. Connect the drive backplane cables to the connectors on the system board and backplane.
2. Install the drives.
3. Install the front top cover.
4. Follow the procedure listed in After working inside your system.

PERC module

This is a service technician replaceable part only.

Removing the front perc 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 front top cover.
4. Remove the drives.
5. Observe and disconnect the drive backplane cables from the connector on the system board and backplane.
6. Remove the drive backplane.

Steps

1. Pull to unlock the plunger on the metal tray of front perc module and slide towards left of the system.
2. Lift the front perc module from the system.
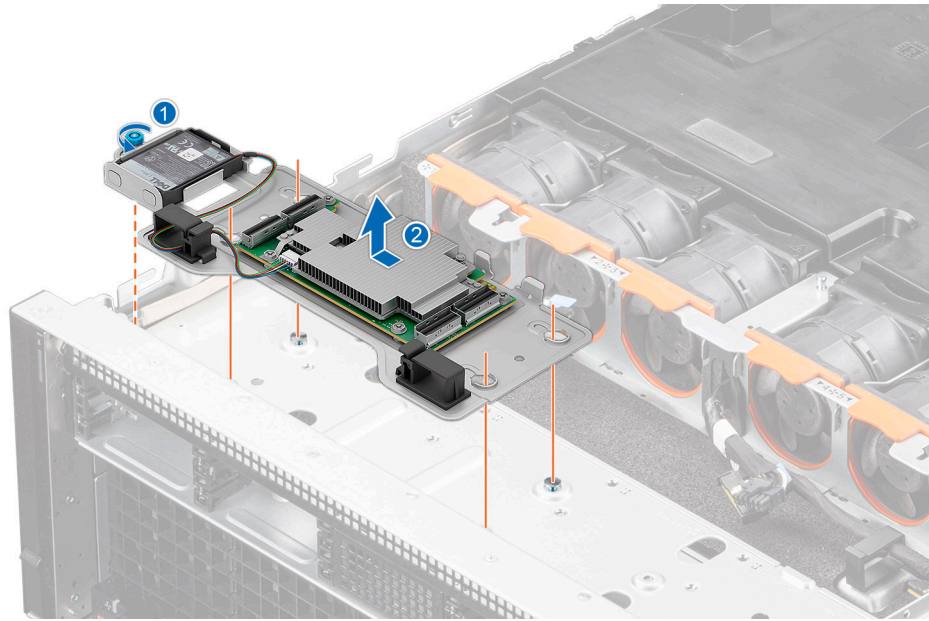
Figure 44. Removing the front perc module

Next steps

1. Replace the front perc module.

Installing the front perc 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 front top cover.

Steps

1. Insert the metal tray with front perc module on the system.
2. Pull the plunger to align the metal tray of front perc module in its place and slide toward right of the system.

   (i) **NOTE:** Plunger auto locks into place.
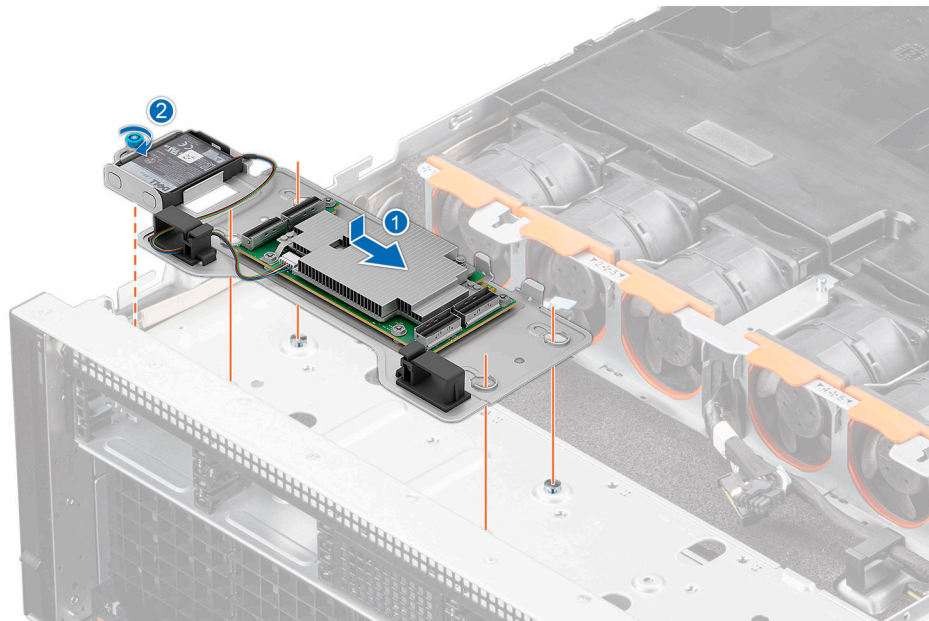
Figure 45. Installing the front perc module

Next steps

1. Replace the backplane
2. Connect the drive backplane cables from the connector on the system board and backplane.
3. Replace the drives.
4. Replace the front top cover.
5. Follow the procedure listed in After working inside your system.

Removing the PERC module from PERC tray

Prerequisites

1.
2. Follow the safety guidelines listed in the Safety instructions.
3. Follow the procedure listed in the Before working inside your system.
4. Remove the front top cover.
5. Remove the drives.
6. Observe and disconnect the drive backplane cables from the connector on the system board and backplane.
7. Remove the drive backplane.
8. Remove the front perc module.

Steps

1. Disconnect the battery power cable from the PERC card.
2. Tilt and lift the battery from the PERC tray battery holder .
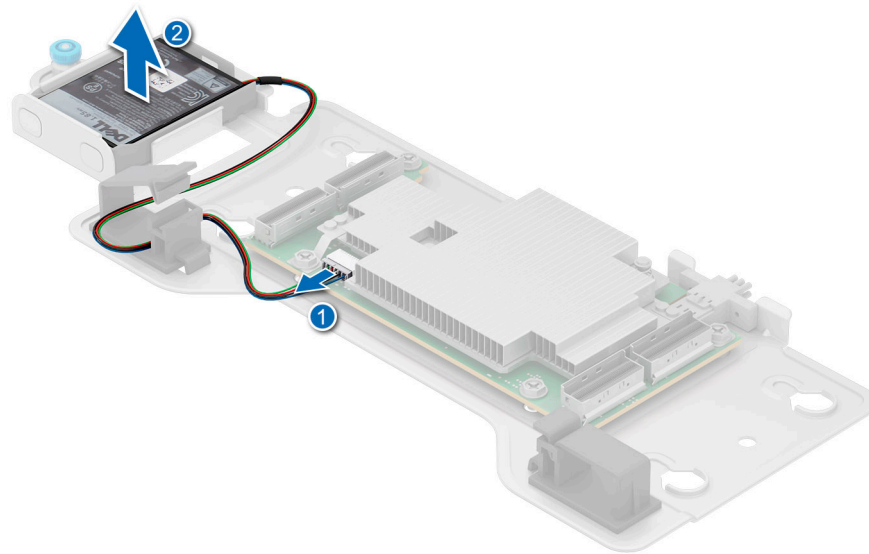
Figure 46. Removing the battery from PERC tray battery holder

3. Using a Phillips #2 screwdriver, remove the four screws on the front PERC card
4. Remove the PERC card from the PERC tray.
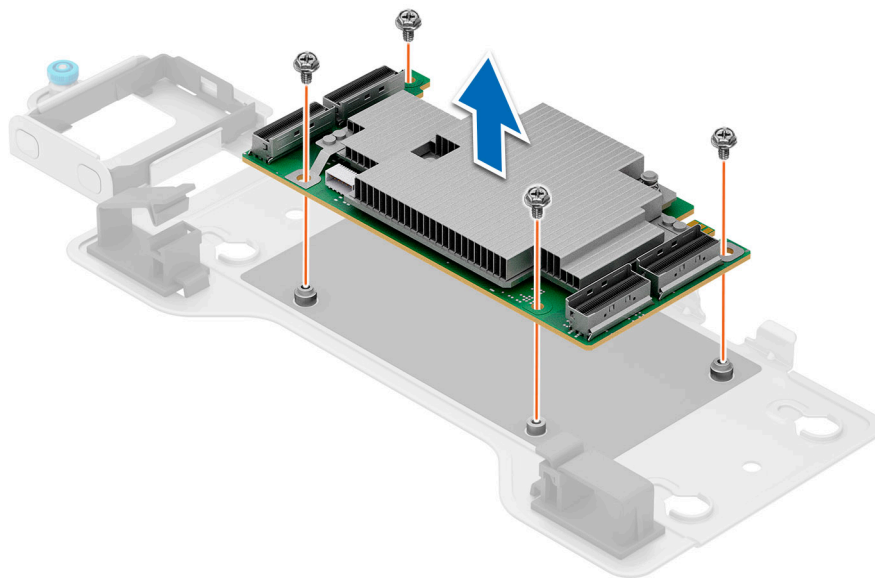
Figure 47. Removing the PERC card from PERC tray

Next steps

1. Replace the PERC module on PERC tray.

Installing the PERC module on PERC tray

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 front top cover.
4. Remove the drives.
5. Observe and disconnect the drive backplane cables from the connector on the system board and backplane.

6. Remove the drive backplane.
7. Remove the front perc module.

Steps

1. Align and install PERC card to front PERC tray.
2. Using a Phillips #2 screwdriver, tighten the four screws to secure the PERC card to the PERC tray.
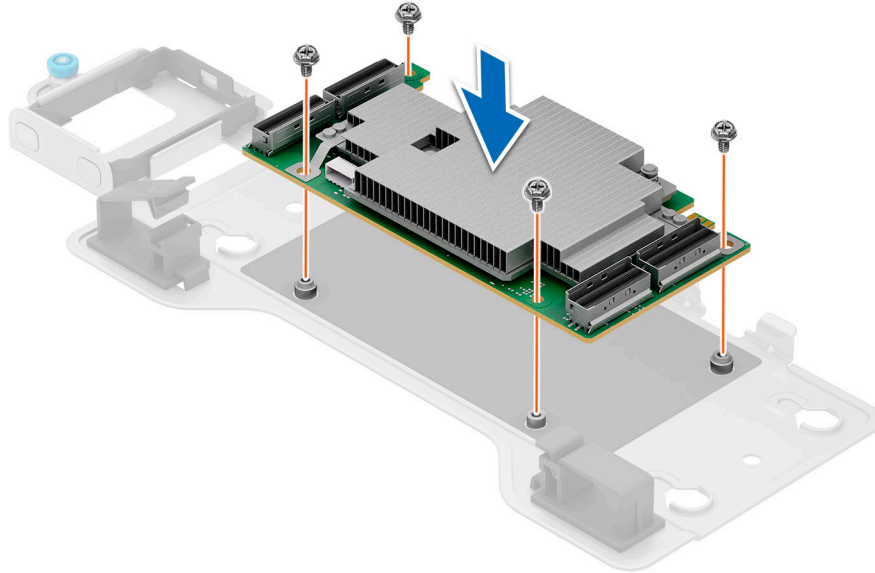
Figure 48. Installing the PERC card into PERC tray

3. Insert the PERC battery into the PERC tray battery holder and ensure the battery is firmly seated.
4. Connect the battery power cable to the front PERC card.

(i) **NOTE:** Route the battery cable into the front PERC tray cable holder.
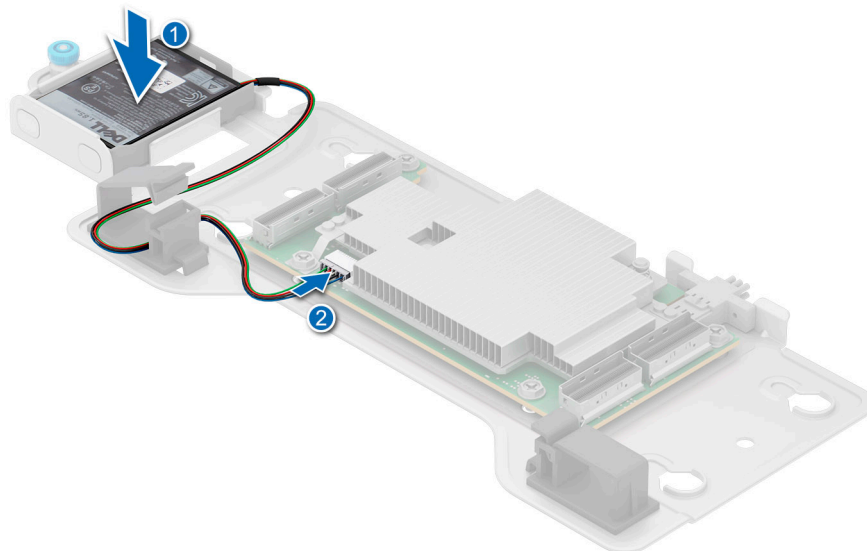
Figure 49. Connect the battery power cable to the front PERC card

Next steps

1. Replace the front PERC module.
2. Replace the drive backplane.
3. Connect the drive backplane cables to the connectors on the system board and backplane.

4. Replace the drives.
5. Replace the front top cover.
6. Follow the procedure listed in After working inside your system.

Cable routing
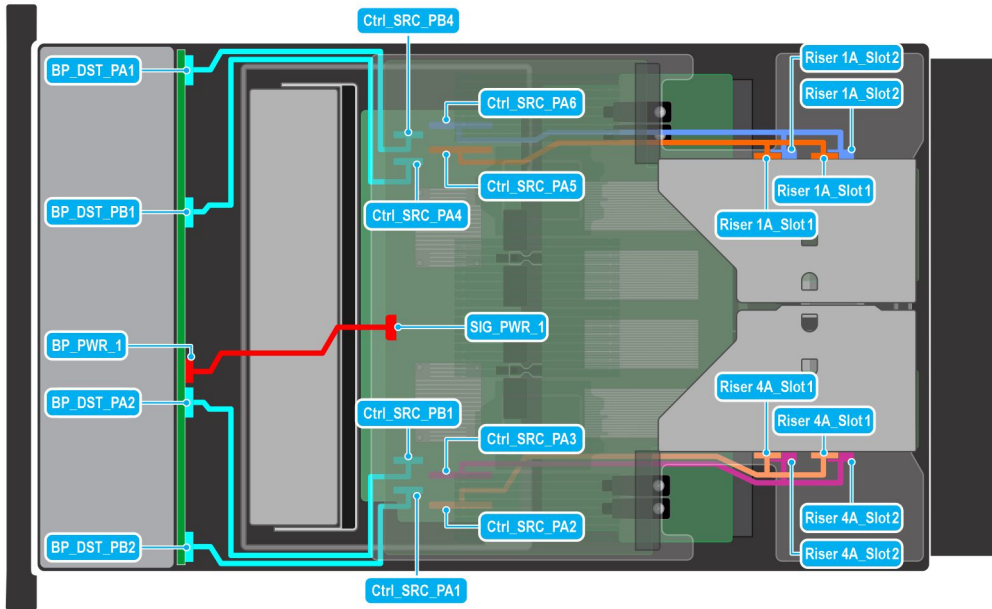
Figure 50. 8 x 2.5-inch NVMe SSD backplane with Risers
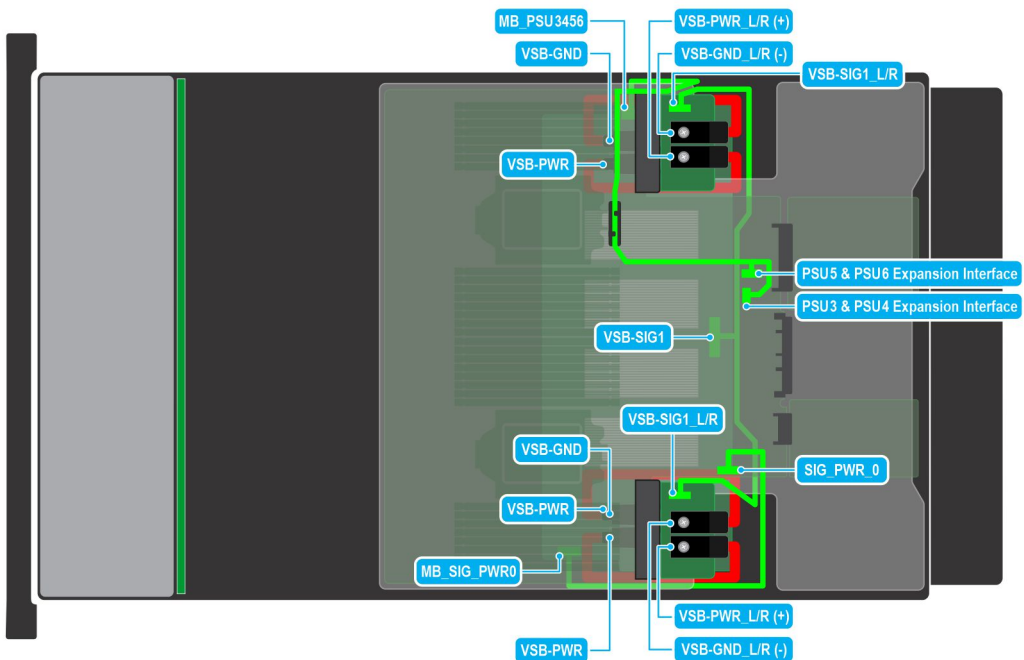
Figure 51. 8 x 2.5-inch NVMe SSD backplane with Risers, VSB, PSUs
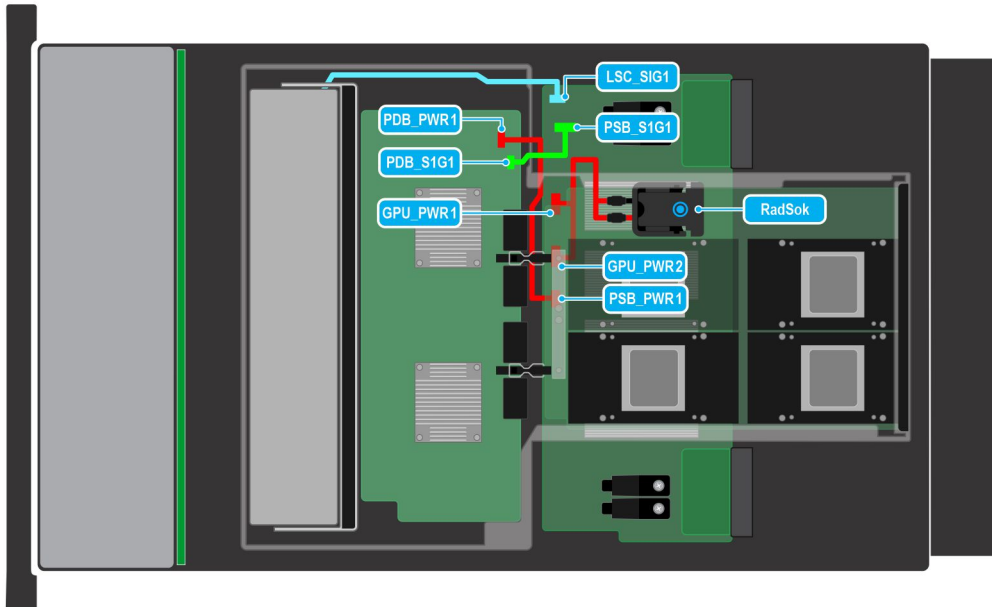
Figure 52. 8 x 2.5-inch NVMe SSD backplane with Risers, VSB, PSUs, GPU
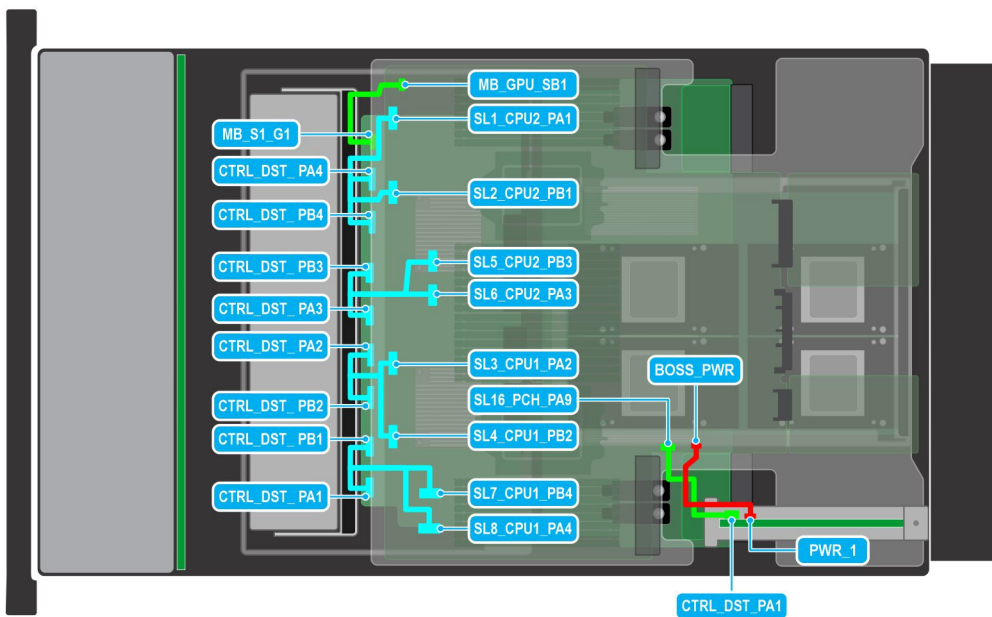
Figure 53. 8 x 2.5-inch NVMe SSD backplane with Risers, VSB, PSUs, LAAC assembly

Cooling fans

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.

3. Remove the air shroud.

Steps

Hold the orange release tab and lift the cooling fan to disconnect the fan from the connector on the system board.
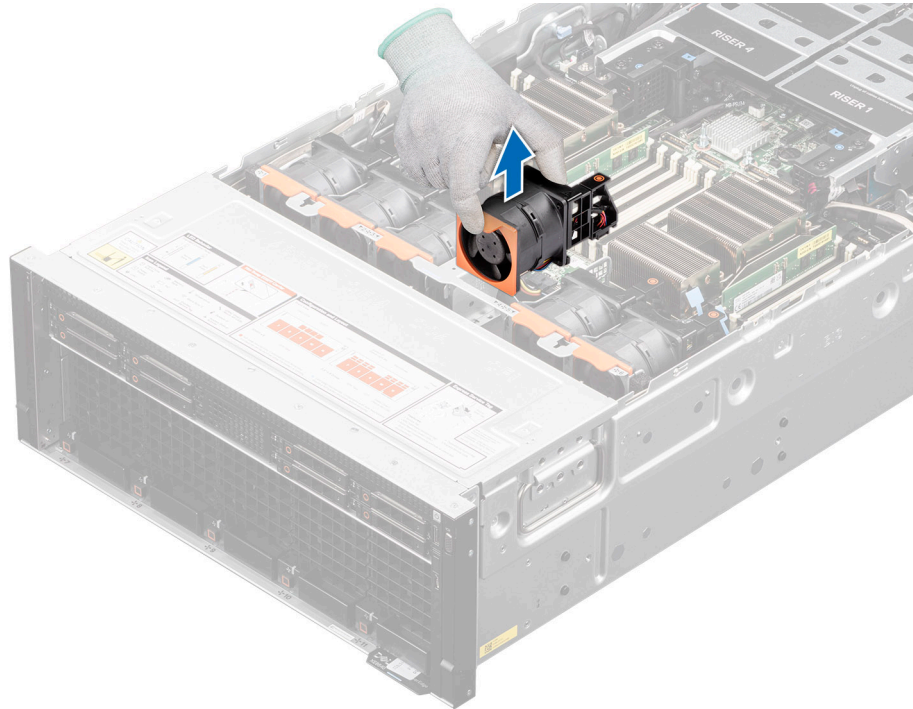
Figure 54. Removing a cooling fan

Next steps

1. Replace a cooling 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.
3. Remove the air shroud.

Steps

Align and lower the cooling fan into the cooling fan assembly until the fan clicks into place.
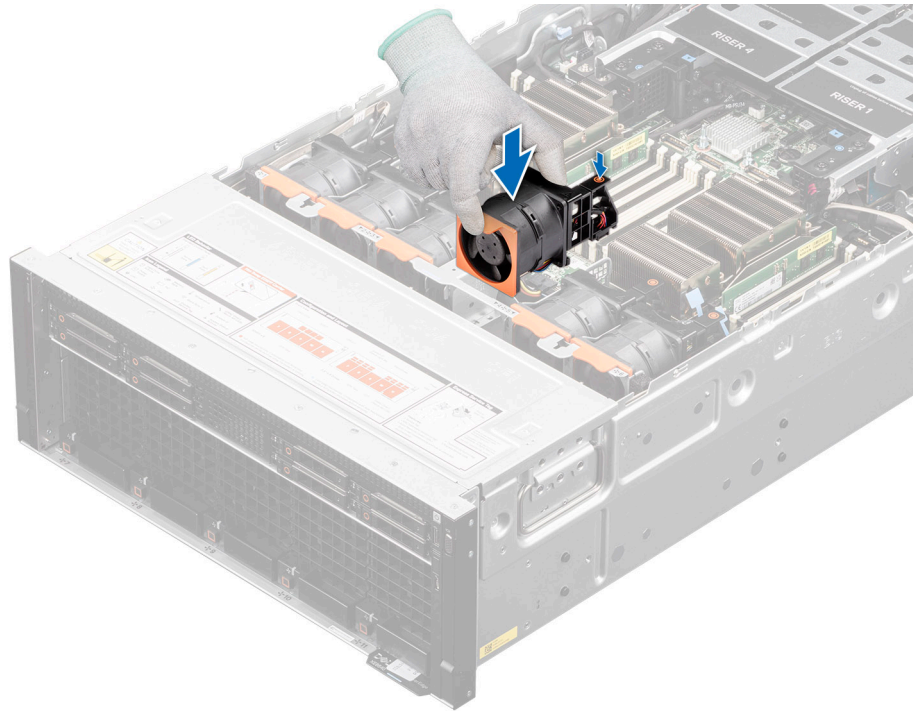
Figure 55. Installing a cooling fan

Next steps

1. Install the air shroud.

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

Removing the cooling fan cage assembly

Prerequisites

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

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

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

3. Remove the air shroud.

4. Remove mid top cover

5. Remove the cooling fan

6. Observe and disconnect the cables from system board and backplane.

Steps

1. Flip out the blue release plunger to unlock the cooling fan cage assembly from the chassis.

2. Hold the blue release plunger and lift the cooling fan cage assembly away from the system.
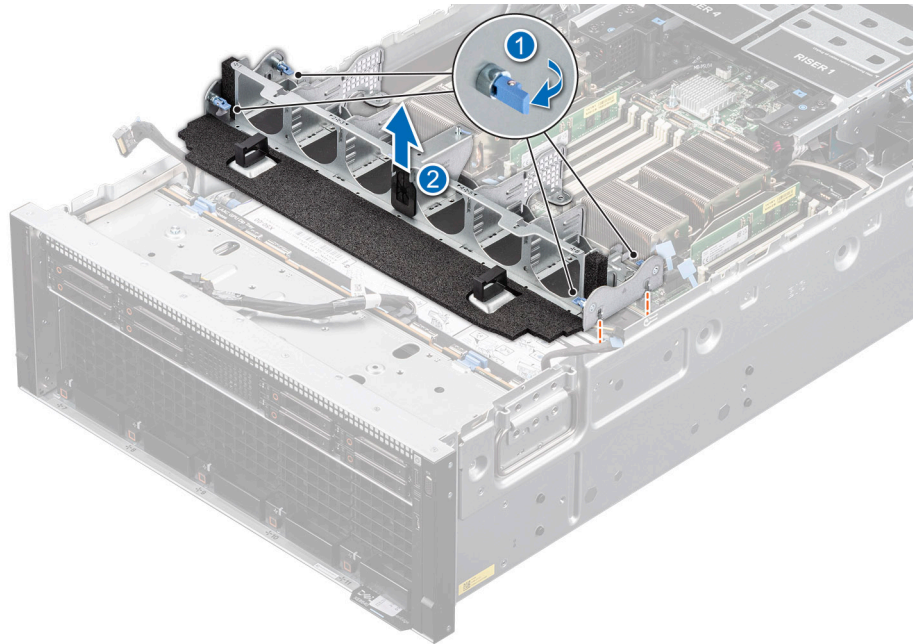
Figure 56. Removing the cooling fan cage assembly

Next steps

1. Replace the cooling fan cage assembly.

Installing the cooling fan cage assembly

Prerequisites

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

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

2. Follow the procedure listed in the Before working inside your system.
3. Remove the air shroud.
4. Remove front top cover
5. Remove the cooling fan
6. Observe and disconnect the cables from system board and backplane.

Steps

1. Holding the blue release plunger of the cooling fan cage, align the guide rails with the guides on the system.
2. Lower the cooling fan cage assembly into the system until seated firmly.
3. Flip in the blue release plunger to lock the cooling fan cage assembly into the system.
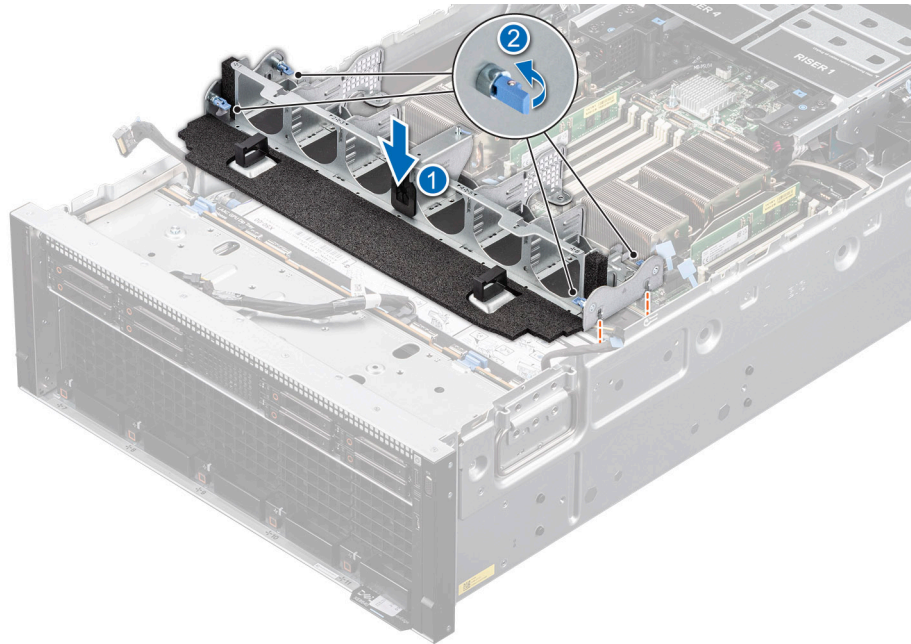
Figure 57. Installing the cooling fan cage assembly

Next steps

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

System memory

System memory guidelines

The PowerEdge XE8640 system supports DDR5 registered DIMMs (RDIMMs). System memory holds the instructions that are started by the processor.

Your system memory is organized into eight channels per processor (two memory sockets per channel),16 memory sockets per processor and 32 memory sockets per system.
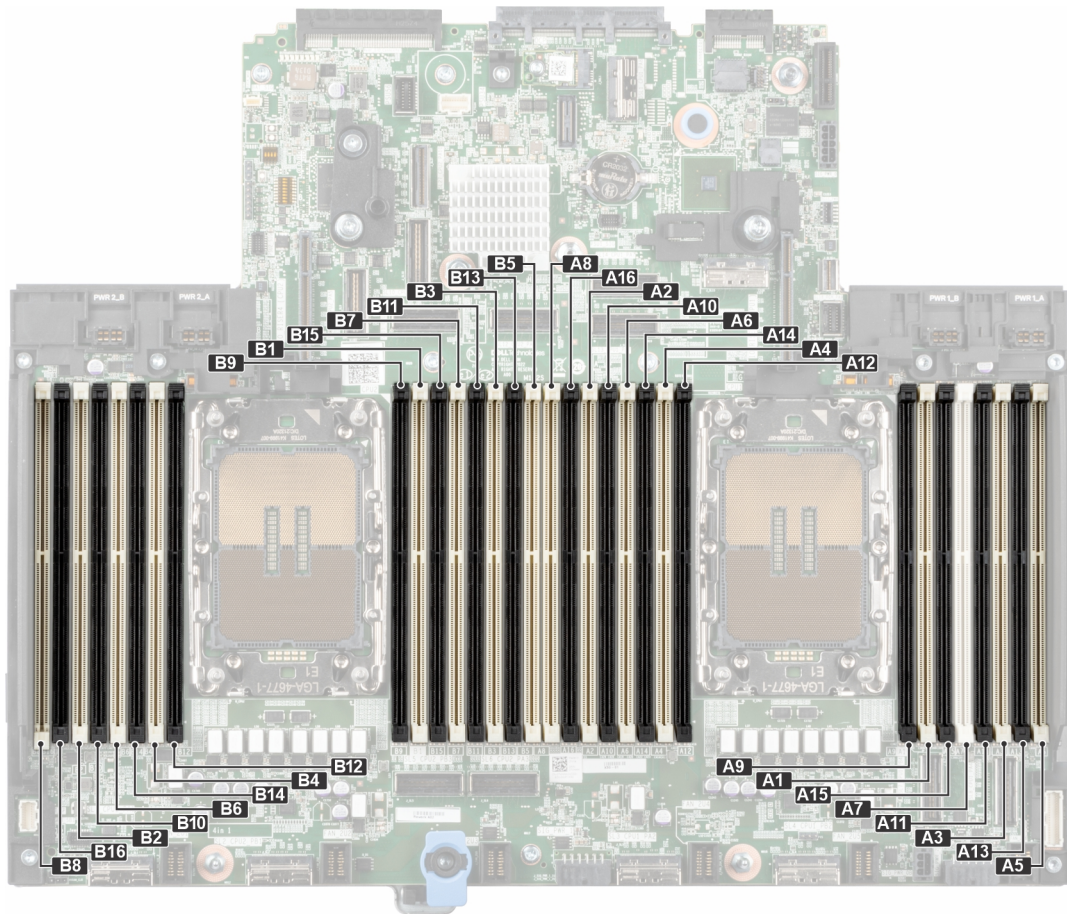
Figure 58. Memory channels

Memory channels are organized as follows:

Table 58. Memory channels

Processor	Channel A	Channel B	Channel C	Channel D	Channel E	Channel F	Channel G	Channel H
Processor 1	Slots A1 and A9	Slots A7 and A15	Slots A3 and A11	Slots A5 and A13	Slots A4 and A12	Slots A6 and A14	Slots A2 and A10	Slots A8 and A16
Processor 2	Slots B1 and B9	Slots B7 and B15	Slots B3 and B11	Slots B5 and B13	Slots B4 and B12	Slots B6 and B14	Slots B2 and B10	Slots B8 and B16

Table 59. Supported memory matrix

DIMM type	Rank per DIMM and Data Width	DIMM capacity (GB)	Speed (MT/s); Voltage (V); DIMM per channel (DPC)	
			1 DIMM per channel (DPC)	**2 DIMMs per channel (DPC)**
RDIMM	DR X 8	32 GB	4800 MT/s	4400 MT/s
	DR X 4	64 GB	4800 MT/s	4400 MT/s
RDIMM 3DS	4R X 4	128 GB	4800 MT/s	4400 MT/s

ⓘ **NOTE:** The processor may reduce the performance of the rated DIMM speed.

ⓘ **NOTE:** Maximum DIMM transfer speed support dependent on CPU SKU and DIMM population.

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 configuration fails 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 speeds of 4800 MT/s depending on the following factors:

- System profile selected (for example, Performance, Performance Per Watt Optimized (OS), 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 MegaTransfers per second.

The following are the recommended guidelines for installing memory modules:

- All DIMMs must be DDR5
- If memory modules with different speeds are installed, they operate at the speed of the slowest installed memory module(s).
- Populate memory module sockets only if a processor is installed.
- For dual-processor systems, sockets A1 to A16 and sockets B1 to B16 are available.
- In **Optimizer Mode**, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.

Table 60. Memory population rules

Processor	Memory population	Memory population information
Dual processor (Start with processor1. Processor 1 and processor 2 population should match)	A{1}, B{1}, A{2}, B{2}, A{3},B{3}, A{4}, B{4}, A{5}, B{5},A{6}, B{6}, A{7}, B{7} A{8},B{8}	Odd amount or DIMMS per processor is allowed. DIMMs must be populated identically per processor

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 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.
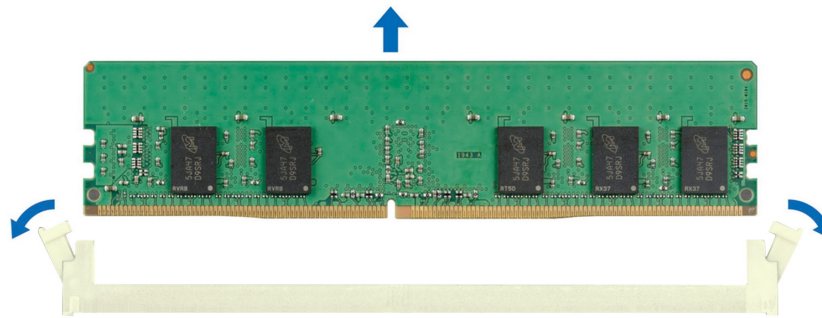
Figure 59. Removing a memory module

Next steps

Replace the memory module, if you are removing a memory module permanently, install a memory module blank.

ⓘ **NOTE:** The procedure to install a memory module blank is similar to the procedure to install a memory module.

ⓘ **NOTE:** To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. The memory module blanks compatible with the XE8640 are DDR5 gray color blanks. Remove the memory module blanks only if you intend to install memory modules in those sockets.

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 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 that 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 that are installed.
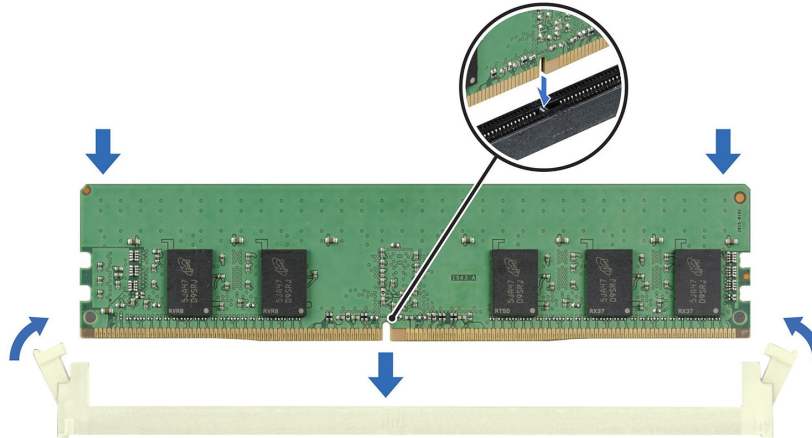
Figure 60. Installing a memory module

Next steps

1. Install the air shroud.
2. Follow the procedure listed in After working inside your system.
3. 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.
4. 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.
5. Run the system memory test in system diagnostics.

Processor and heat sink module

This is a service technician replaceable part only.

Removing the processor and heat sink module(PHM)

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. ⓘ **NOTE:** The heat sink and processor are hot to touch for some time after the system has been powered off. Allow the heat sink and processor to cool down before handling them.

   Remove the system cover .
4. Remove the air shroud.
5. Remove memory module

Steps

1. Ensure all four anti-tilt wires are in the locked position (outward position), and then using a Torx T30 screwdriver, loosen the captive nuts on the processor heat sink module (PHM) in the order that is mentioned below:

    a. Loosen the first nut three turns.

    b. Loosen the nut diagonally opposite to the nut you loosened first.

    c. Repeat the procedure for the remaining two nuts.

    d. Return to the first nut and loosen it completely.

    ⓘ **NOTE:** Ensure that the anti-tilt wires on the PHM are in locked position when loosening the captive nuts.

2. Set all the anti-tilt wires to unlocked position (inward position).
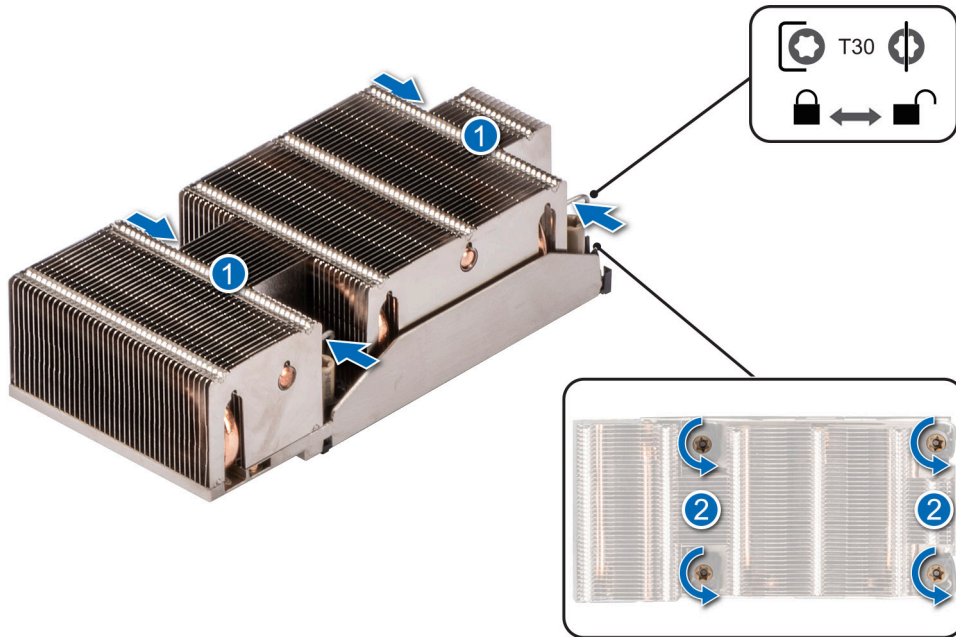
Figure 61. Removing the processor heat sink module

3. Lift the PHM from the system and set the PHM aside with the processor side facing up.
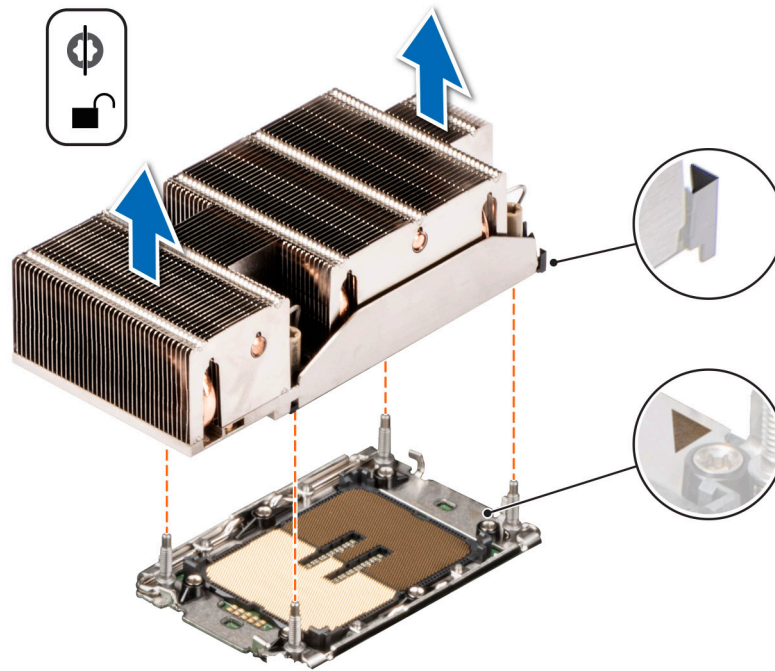
Figure 62. Removing a heat sink

Next steps

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

Removing the processor

Prerequisites

⚠ **WARNING: Remove the processor from processor and heat sink module (PHM) only if you are replacing the processor or heat sink.**

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 air shroud.
4. Remove the processor heat sink module.

⚠ **CAUTION: You may find the CMOS battery loss or CMOS checksum error that is displayed during the first instance of powering on the system after the processor or system board replacement which is expected. To fix this, simply go to setup option to configure the system settings.**

Steps

1. Place the heat sink with the processor side facing up.
2. Using your thumb, lift the thermal interface material (TIM) break lever to release the processor from the TIM and retaining clip.
3. Holding the processor by the edges, lift the processor away from the retaining clip.

   ⓘ **NOTE:** Ensure to hold the retaining clip to the heat sink as you lift the TIM break lever.
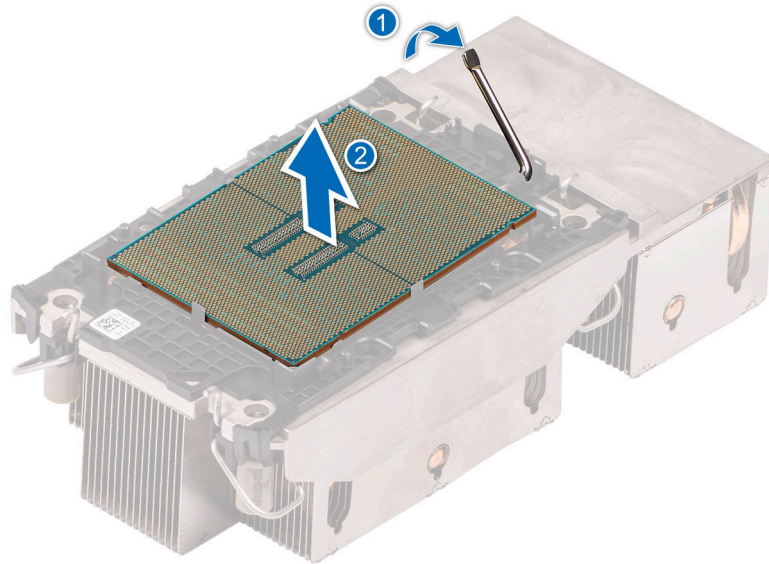
Figure 63. Removing the processor

ⓘ **NOTE:** Ensure to return the TIM break lever back to original position.

4. Using your thumb and index finger, first hold the retaining clip release tab at the pin 1 connector, pull out the tip of the retaining clip release tab, and then lift the retaining clip partially from the heat sink.
5. Repeat the procedure at the remaining three corners of the retaining clip.
6. After all the corners are released from the heat sink, lift the retaining clip from the pin 1 corner of the heat sink.
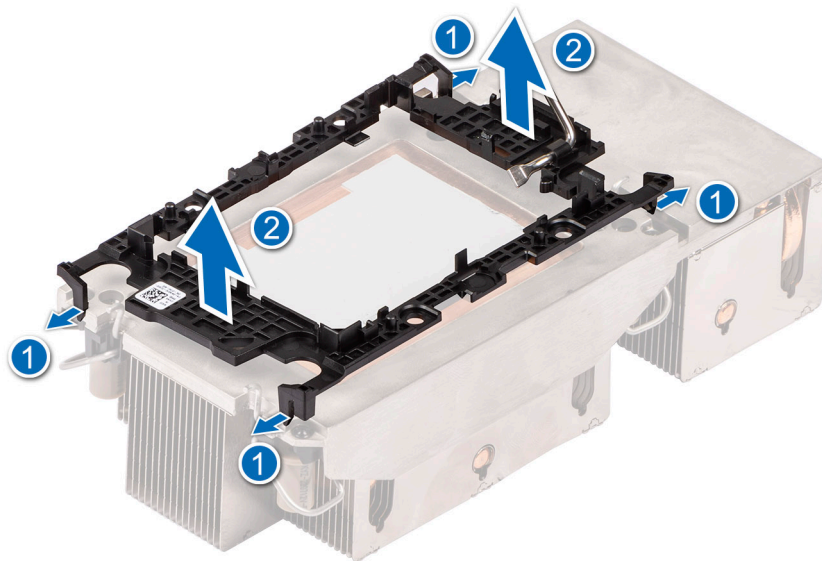
Figure 64. Removing the retaining clip

Next steps

Replace the processor.

Installing the processor

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 system cover.
4. Remove the air shroud.
5. Remove the processor heat sink module.

Steps

1. Place the processor in the processor tray.

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

2. Place the retaining clip on top of the processor in the processor tray aligning pin 1 indicator on the processor.

   ⓘ **NOTE:** Ensure the pin 1 indicator on the retaining clip is aligned with the pin 1 indicator on the processor before placing the retaining clip on the processor.

   ⓘ **NOTE:** Before you install the heat sink, ensure to place the processor and retaining clip in the tray.
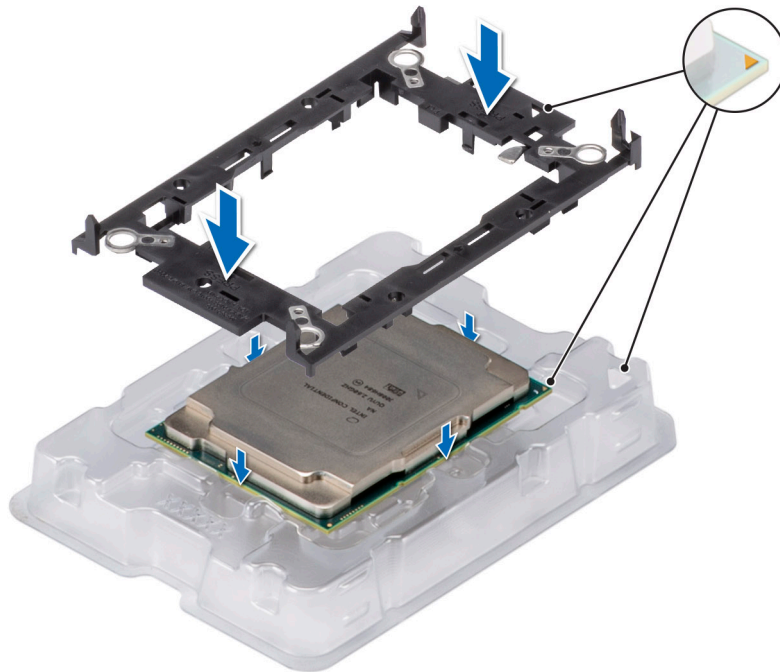
Figure 65. Installing the retaining clip

3. Align the processor with retaining clip, by using your fingers press the retaining clip on all the four sides until it clicks into place.

   ⓘ **NOTE:** Ensure that the processor is securely latched to the retaining clip.
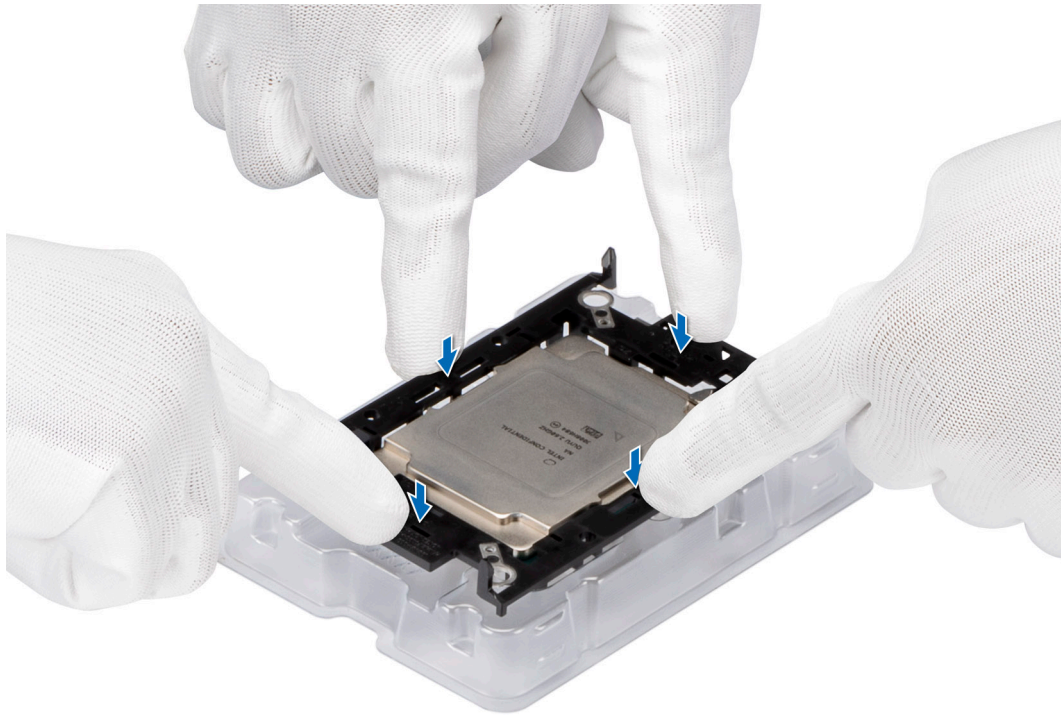
Figure 66. Press the retaining clip on the four sides

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

⚠ **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 67. Applying thermal grease

6. For new heat sink, remove the Thermal Interface Material (TIM) protective film from the base of heat sink.
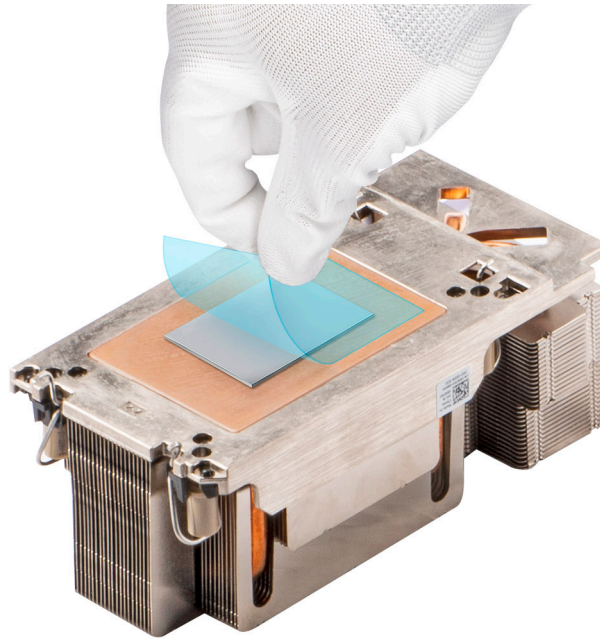
Figure 68. Removing the Thermal Interface Material (TIM) protective film

7. Place the heat sink on the processor and press the base of the heat sink until the retaining clip locks onto the heat sink at all the four corners.

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

ⓘ **NOTE:**
- Ensure latching features on retaining clip, and heat sink are aligned during assembly.
- Ensure that the pin 1 indicator on the heat sink is aligned with the pin 1 indicator on the retaining clip before placing the heat sink onto the retaining clip.
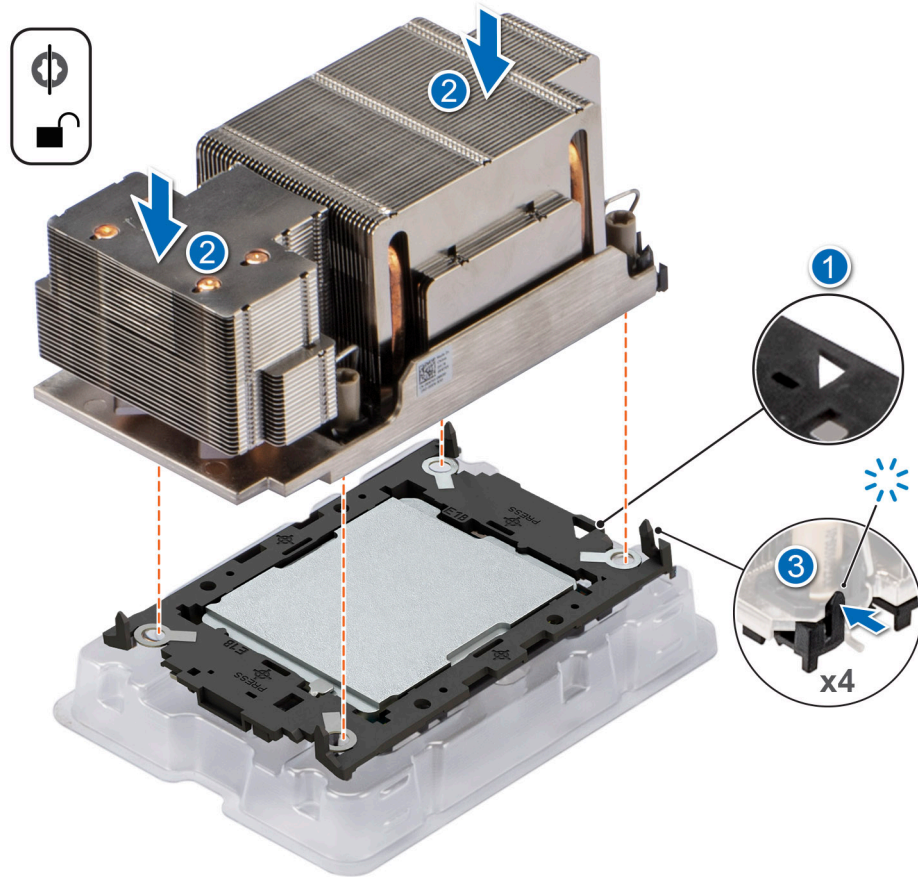
Figure 69. Installing the heat sink onto the processor

Next steps

1. Replace the processor heat sink module.
2. Replace the air shroud
3. Replace the memory module
4. Replace the front top cover.
5. Follow the procedure listed in After working inside your system.

Installing the processor and heat sink module

Prerequisites

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

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 air shroud.
4. Remove memory module

Steps

1. Set the anti-tilt wires to the unlocked position on the heat sink (inward position).
2. Align the pin 1 indicator of the heat sink to the system board, and then place the processor 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.**

Figure 70. Installing the processor heat sink

3. Set the anti-tilt wires to the locked position (outward position), and then using the Torx T30 screwdriver, tighten the captive nuts (12 in-lbf) on the heat sink in the order below:

   a. In a random order, tighten the first nut three turns.
   b. Tighten the nut diagonally opposite to the nut that you tighten first.
   c. Repeat the procedure for the remaining two nuts.
   d. Return to the first nut to tighten it completely.
   e. Check all the nuts to ensure they are firmly secured.
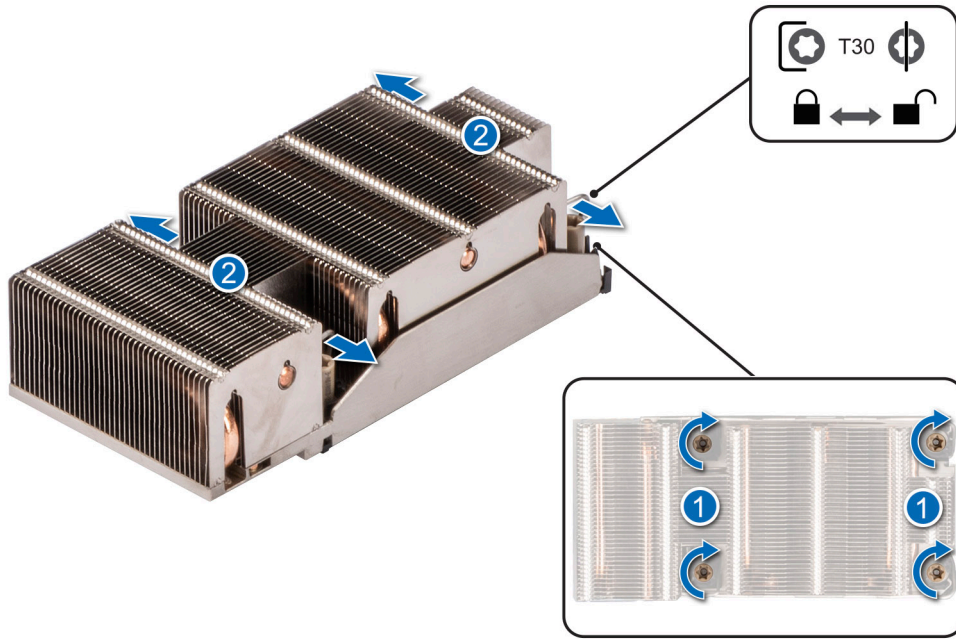
Figure 71. Set the anti-tilt wires to the locked position and tightening the nuts

Next steps

1. Install the air shroud.
2. Follow the procedure listed in After working inside your system.

Expansion cards and expansion card risers

ⓘ **NOTE:** When an expansion card is not supported or missing, the iDRAC and Lifecycle Controller logs an event. This does not prevent your system from booting. However, if a F1/F2 pause occurs with an error message, see *Troubleshooting expansion cards* section in the *PowerEdge Servers Troubleshooting Guide* at www.dell.com/poweredgemanuals.

Expansion card installation guidelines
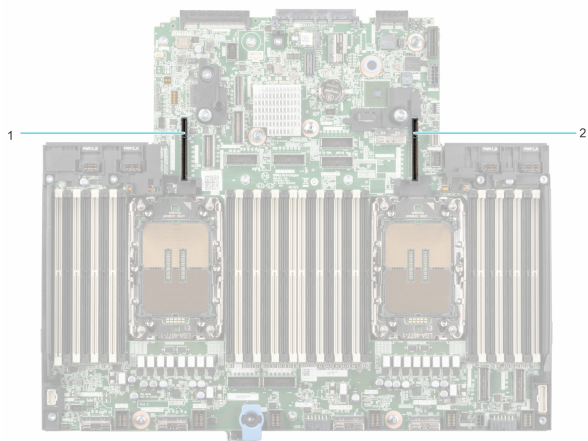
Figure 72. Expansion card slot connectors

1. Riser 4A connector
2. Riser 1A connector
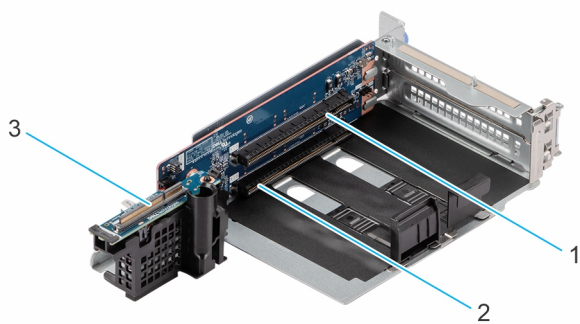
Figure 73. Riser 1A

1. x16_slot
2. x16_slot
3. PCIe connector
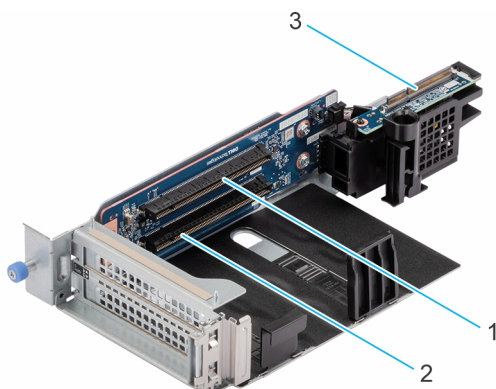
Figure 74. Riser 4A

1. x16_slot
2. x16_slot
3. PCIe connector

(i) **NOTE:** The expansion-card slots are not hot-swappable.

(i) **NOTE:** PCIe riser board is required to be in place all the time. (I2C failure alert will be triggered if PCIe riser board is not in place.)

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

Table 61. Configuration 1: R1A+R4A

Supplier	Card type	Slot priority	Maximum number of cards	Slot generation
Intel	NIC:100Gb	1, 3, 2, 4	4	Gen4
Mellanox	NIC:100Gb	1, 3, 2, 4	4	Gen4
Mellanox	NIC:25Gb	1, 3, 2, 4	4	Gen4
Intel	NIC:25Gb	1, 3, 2, 4	4	Gen4
Broadcom	NIC:100Gb	1, 3, 2, 4	4	Gen4
Broadcom	NIC:25Gb	1, 3, 2, 4	4	Gen3
Broadcom	NIC:25Gb	1, 3, 2, 4	4	Gen4
Intel	NIC:25Gb	1, 3, 2, 4	4	Gen4
Mellanox	InfiniBand	1, 3, 2, 4	4	Gen5
Mellanox	InfiniBand	1, 3, 2, 4	4	Gen5
Mellanox	InfiniBand	1, 3, 2, 4	4	Gen4

Removing the expansion card risers

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 air shroud.
4. Disconnect any cables that are connected to the expansion card or the risers.

Steps

For Riser 1A and Riser 4A, first using a Phillips 2 screwdriver, loosen the blue thumb screws on the riser. Press the blue release tab and holding the blue touch points, lift the expansion card riser from the riser connector on the system board.
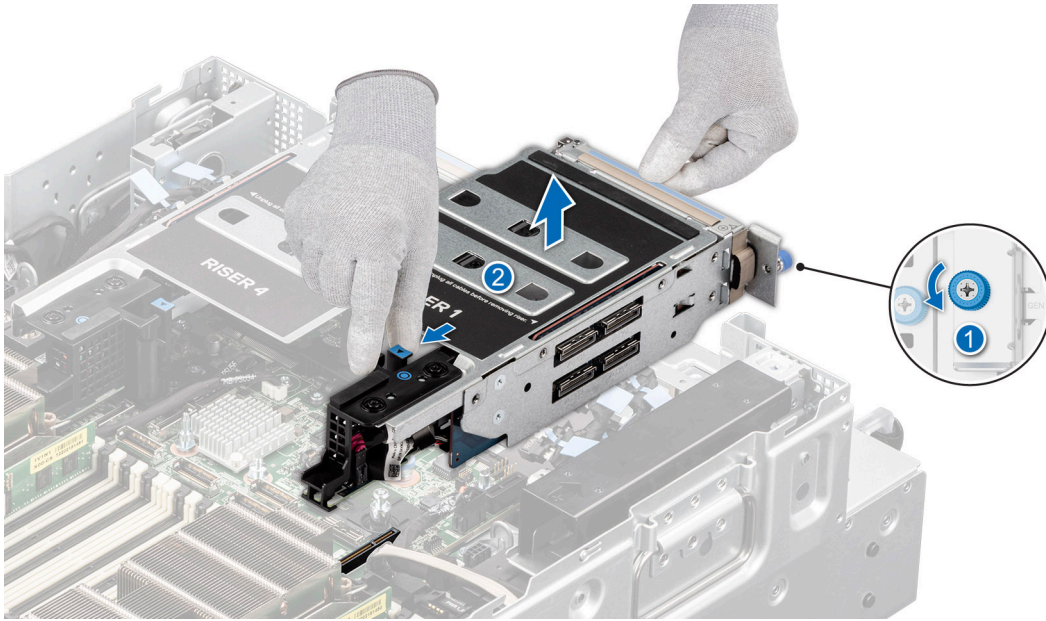
Figure 75. Removing the expansion card riser (Riser 1A)
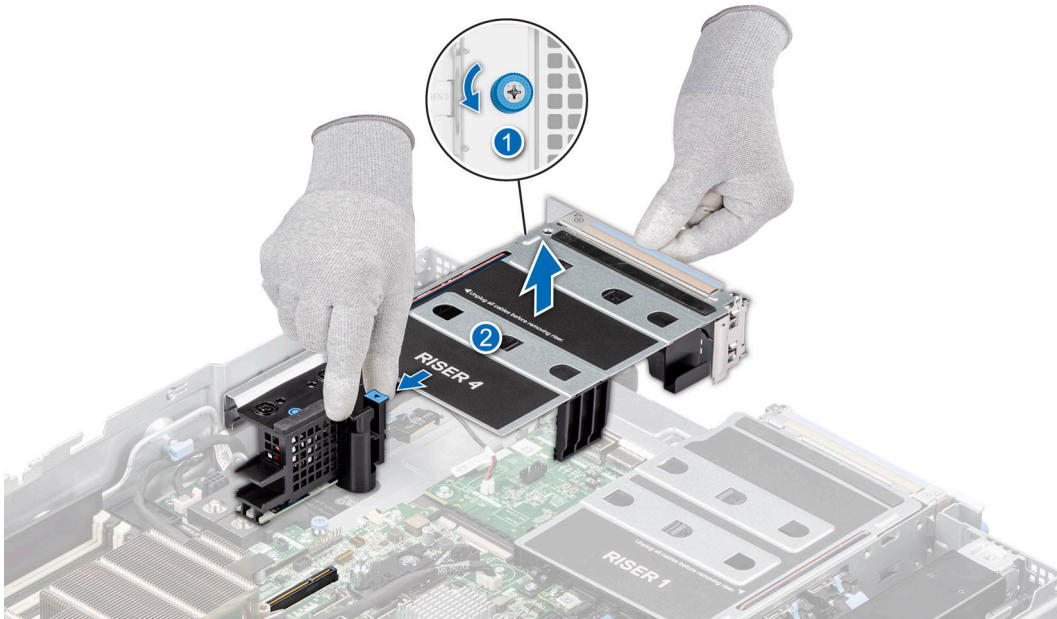
Figure 76. Removing the expansion card riser (Riser 4)

Next steps

Replace the expansion card riser.

Installing the expansion card risers

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 air shroud.
4. If removed, install the expansion cards into the expansion card risers.

Steps

For Riser 1A and Riser 4A, holding the blue touch points, align the holes on the expansion card riser with the guides on the system board. Lower the expansion card riser into place and press the touch points until the expansion card riser connector is fully seated on the system board connector. Using a Phillips 2 screwdriver, tighten the blue thumb screw on the riser.

ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
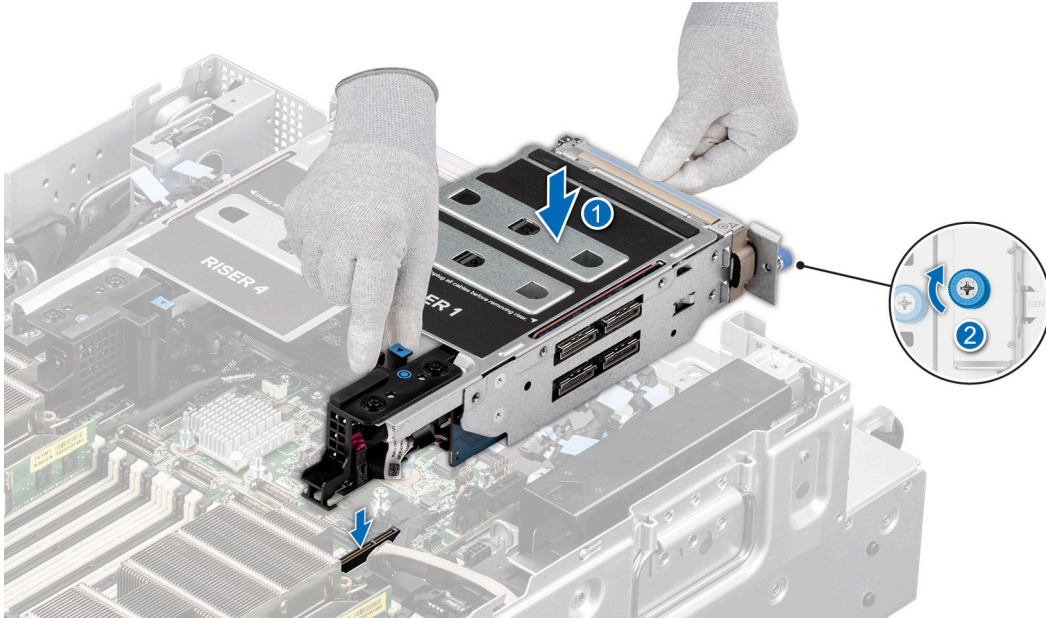
Figure 77. Installing the expansion card riser (Riser 1A)
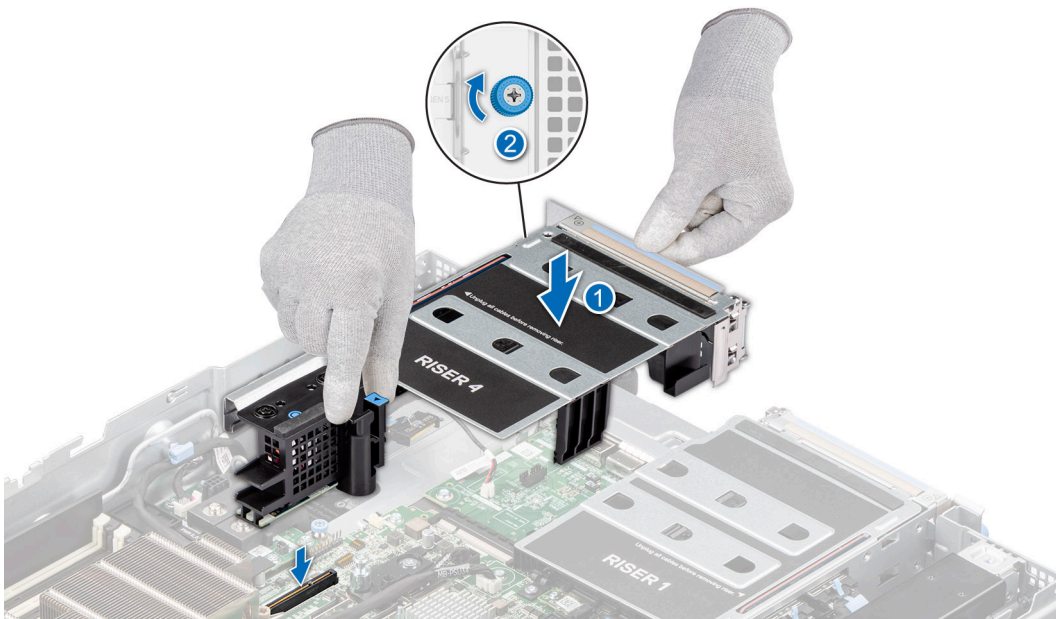
Figure 78. Installing the expansion card riser (Riser 4A)

Next steps

1. If required, connect the cables to the expansion card or the risers.
2. Follow the procedure listed in After working inside your system.
3. Install any device drivers required for the card as described in the documentation for the card.

Removing expansion card from the expansion card 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 applicable, disconnect the cables from the expansion card.
4. Remove the expansion card riser.

Steps

1. For Riser 1A, first pull the black card holder before removing the card from the Riser 1A. Pull and lift the expansion card retention latch lock to open. Hold the expansion card by the edges, and pull the card until the card edge connector disengages from the expansion card connector on the Riser 1A.

   ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
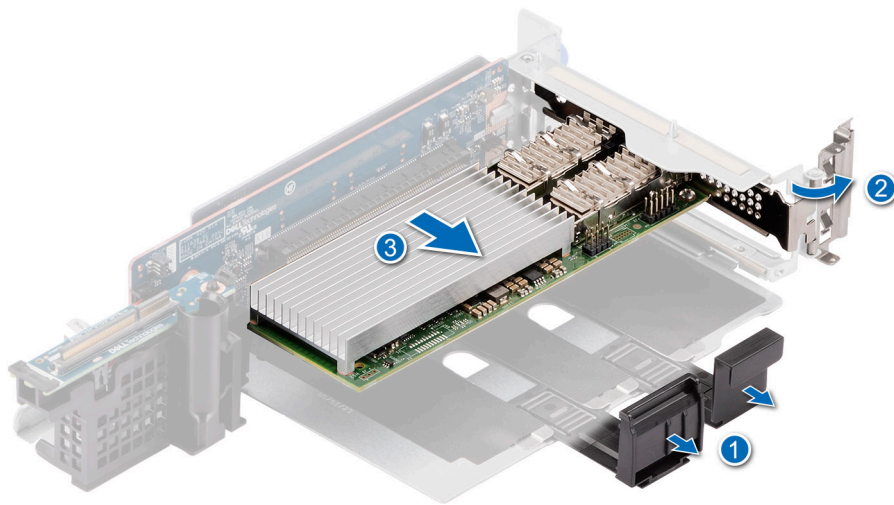
Figure 79. Removing expansion card from Riser 1A

2. For Riser 4A, first pull and lift the expansion card retention latch lock to open. Pull the black card holder before removing the card from the Riser 4A. Hold the expansion card by the edges, and pull the card until the card edge connector disengages from the expansion card connector on the Riser 1A.

   ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
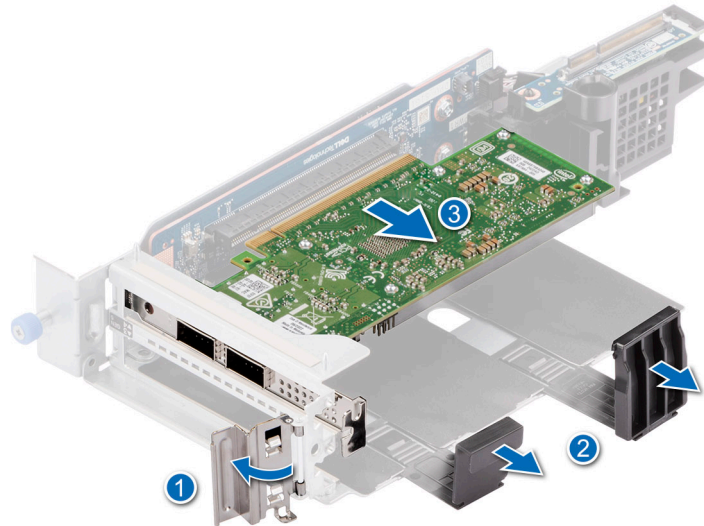
Figure 80. Removing expansion card from Riser 4A

3. If the expansion card is not going to be replaced, install a filler bracket and close the card retention latch.
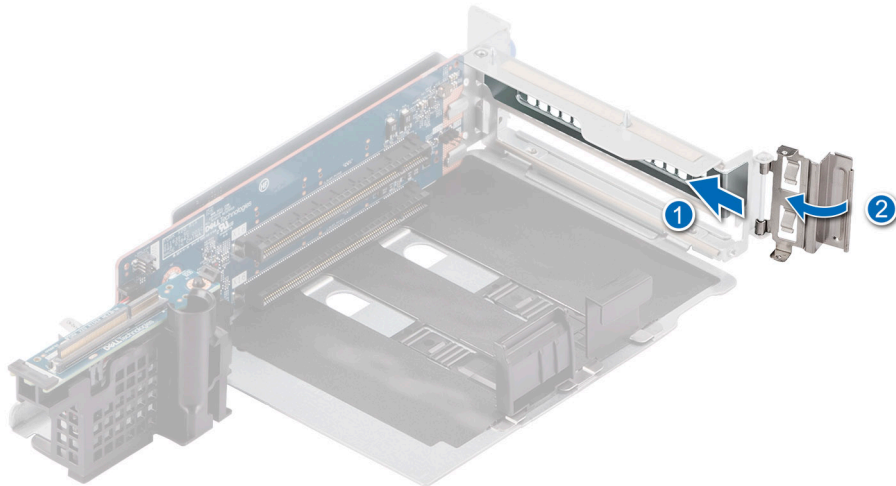
Figure 81. Installing the filler bracket for the Riser 1A
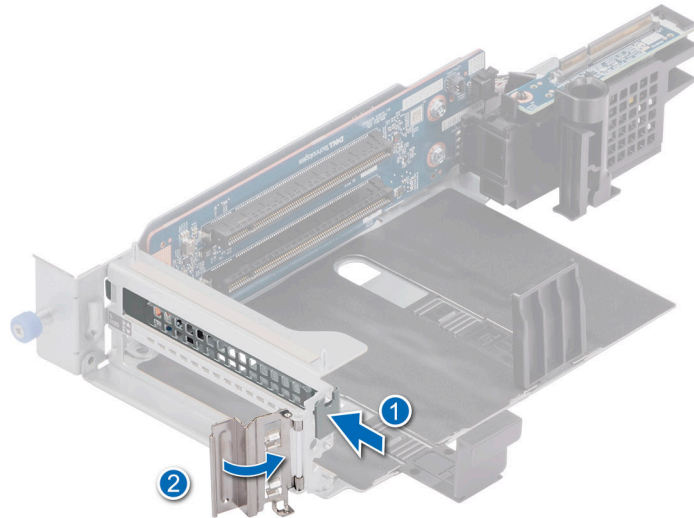
Figure 82. Installing the filler bracket for the Riser 4A

Next steps

If applicable, install an expansion card into the expansion card riser.

Installing an expansion card into the expansion card 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.

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

4. If applicable, disconnect the cables from the expansion card.
5. Remove the expansion card riser.

Steps

1. Pull and lift the expansion card retention latch lock to open.
2. If installed, remove the filler bracket.

   (i) **NOTE:** Store the filler bracket for future use. Filler brackets must be installed in empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.
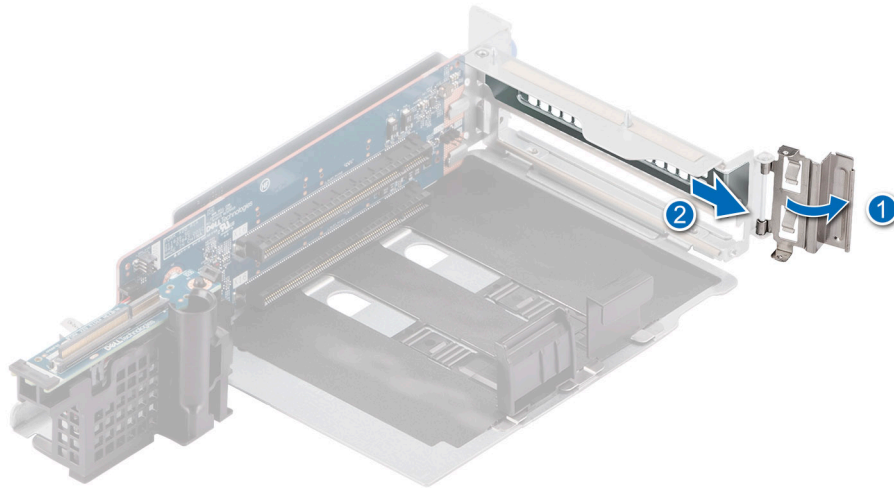
Figure 83. Removing the filler bracket for Riser 1A
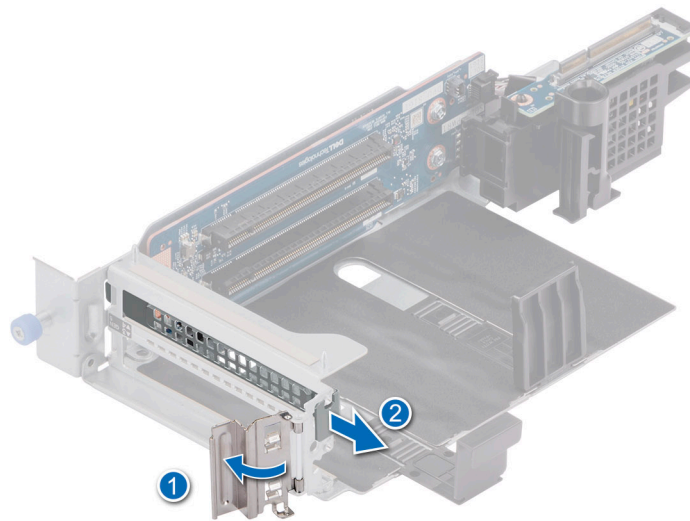
Figure 84. Removing the filler bracket for Riser 4A

3. For Riser 1A, first pull the black card holder, hold the card by its edges, and align the card edge connector with the expansion card connector on the riser. Insert the card edge connector firmly into the expansion card connector until the card is fully seated. Close the metal retention latch. Push the black card holder to hold the card in the riser.

ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
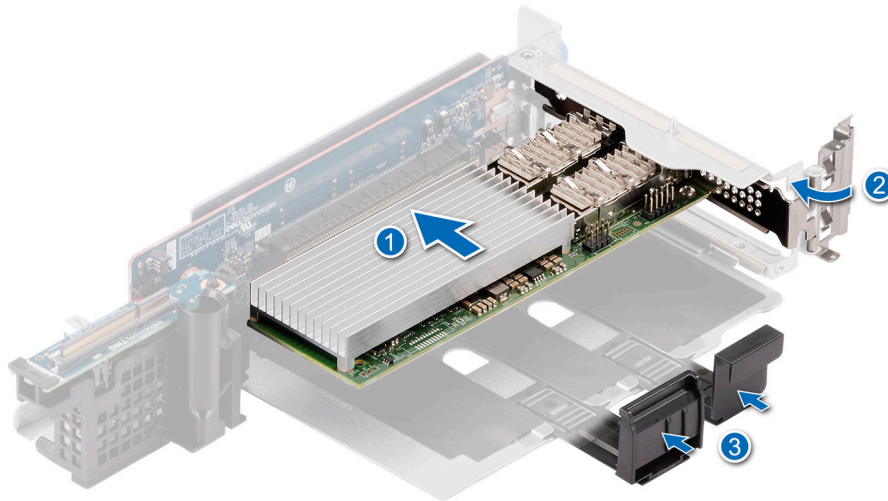
Figure 85. Installing an expansion card into Riser 1A

4. For Riser 4A, first pull the black card holder, hold the card by its edges, and align the card edge connector with the expansion card connector on the riser. Insert the card edge connector firmly into the expansion card connector until the card is fully seated. Push the black card holder to hold the card in the riser. Close the metal retention latch.

(i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
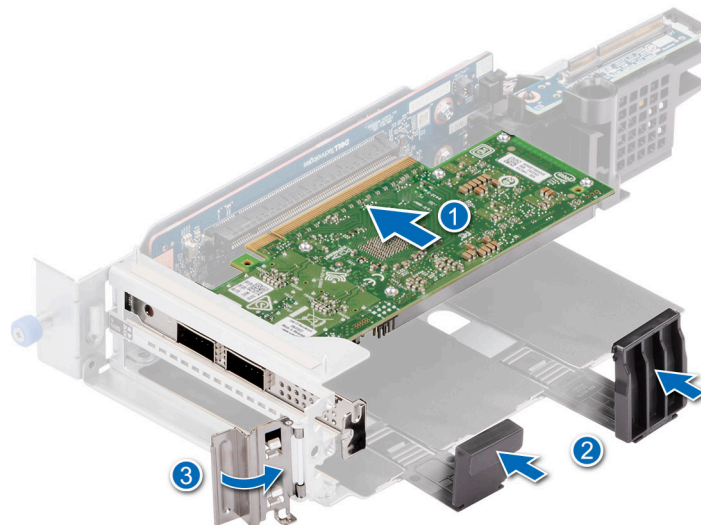
Figure 86. Installing an expansion card into Riser 1A

Next steps

1. If applicable, connect the cables to the expansion card.
2. Follow the procedure listed in After working inside your system.
3. Install any device drivers required for the card as described in the documentation for the card.

Intrusion switch

This is a service technician replaceable part only.

Removing the intrusion switch 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 air shroud.
4. Remove the expansion card riser 4.

(i) **NOTE:** Ensure that you note the routing of the cable as you remove it from the system board. Route the cable properly when you replace it to prevent the cable from being pinched or crimped.

Steps

1. Disconnect the intrusion switch cable from the connector on the rear I/O board.
2. Using a Phillips 1 screwdriver, loosen the screw on the intrusion switch module.
3. Lift the intrusion switch module out of the slot on the system.
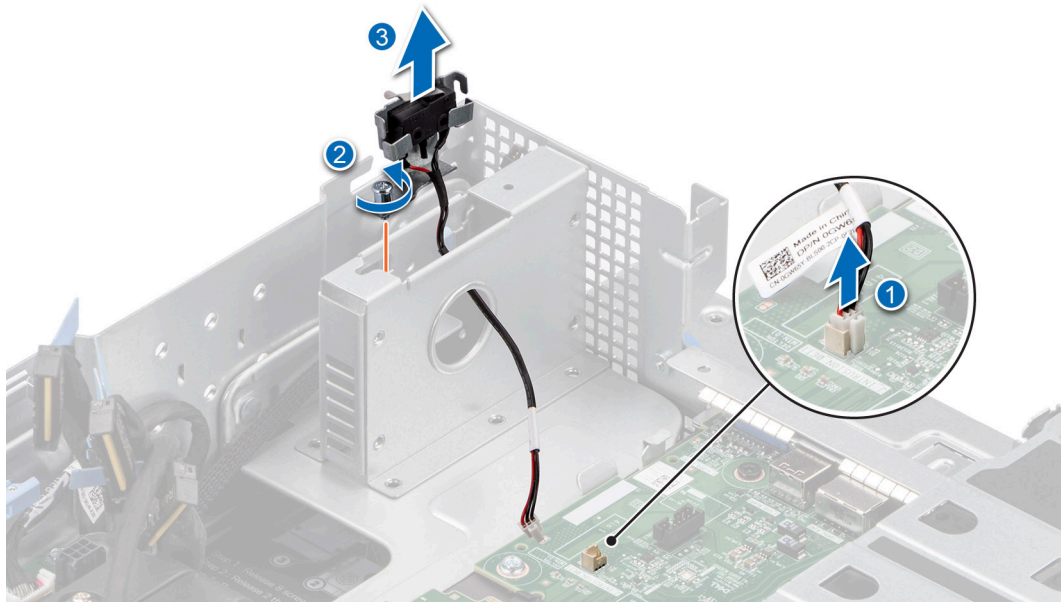
Figure 87. Removing the intrusion switch module

Next steps

1. Replace the intrusion switch module.

Installing the intrusion switch 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 air shroud.
4. Remove the expansion card riser 4.

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

Steps

1. Align and slide the intrusion switch module into the slot in the system until firmly seated.
2. Using a Phillips 1 screwdriver, tighten the screw on the intrusion switch module.
3. Connect the intrusion switch cable to the connector on the rear I/O board.
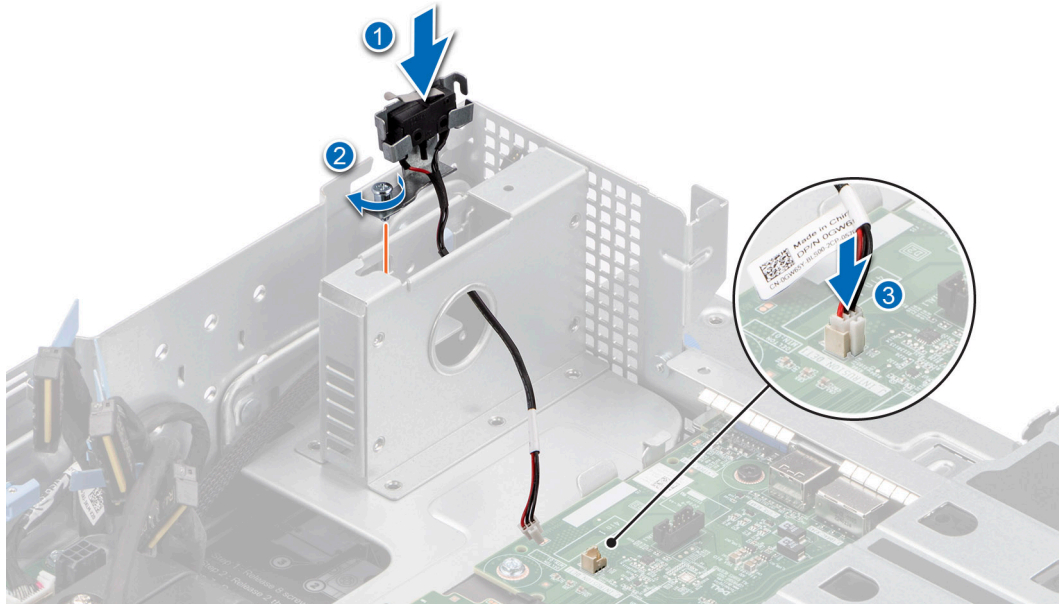
Figure 88. Installing the intrusion switch module

Next steps

1. Replace the expansion card riser 4.
2. Replace the air shroud
3. Follow the procedure listed in After working inside your system.

Optional OCP card

Removing the OCP 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. Remove the expansion card risers.

Steps

1. Open the blue latch to disengage the OCP card.
2. Push the OCP card toward the rear end of the system to disconnect from the connector on the system board.
3. Slide the OCP card out of the slot on the system.
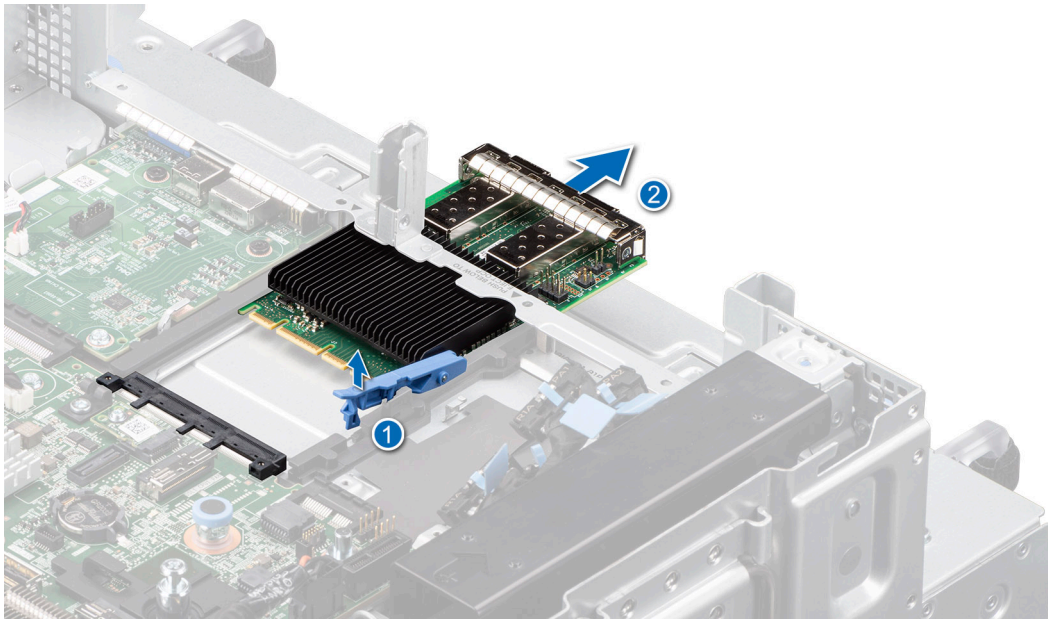
Figure 89. Removing the OCP card

4. If the OCP card is not going to be replaced, install a OCP shroud and filler bracket .

(i) **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.
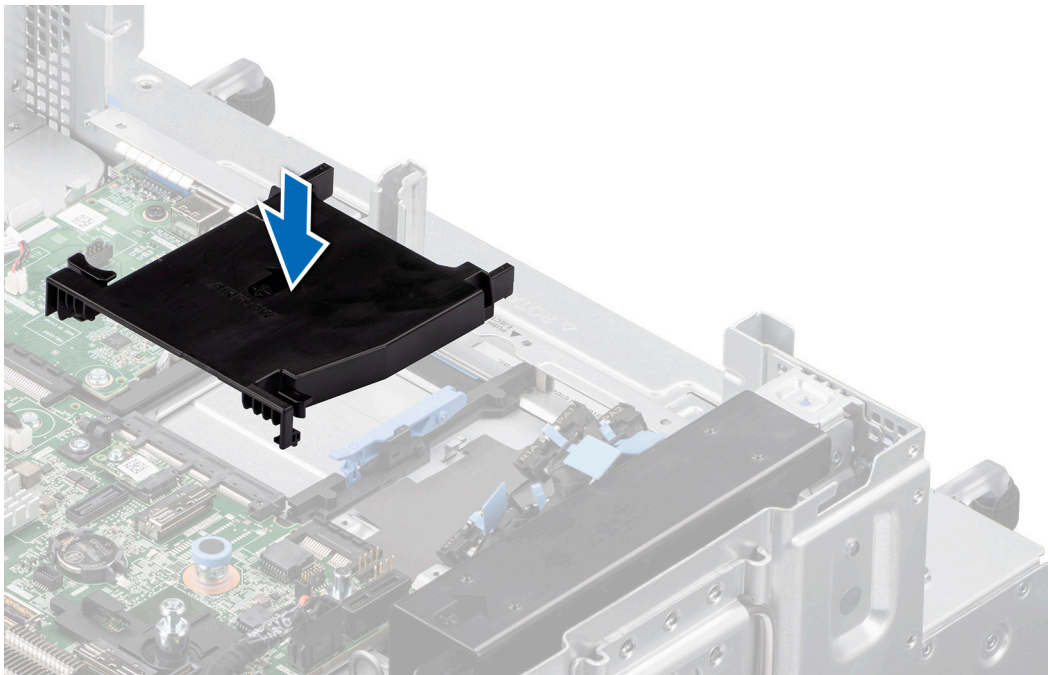
Figure 90. Installation of OCP shroud
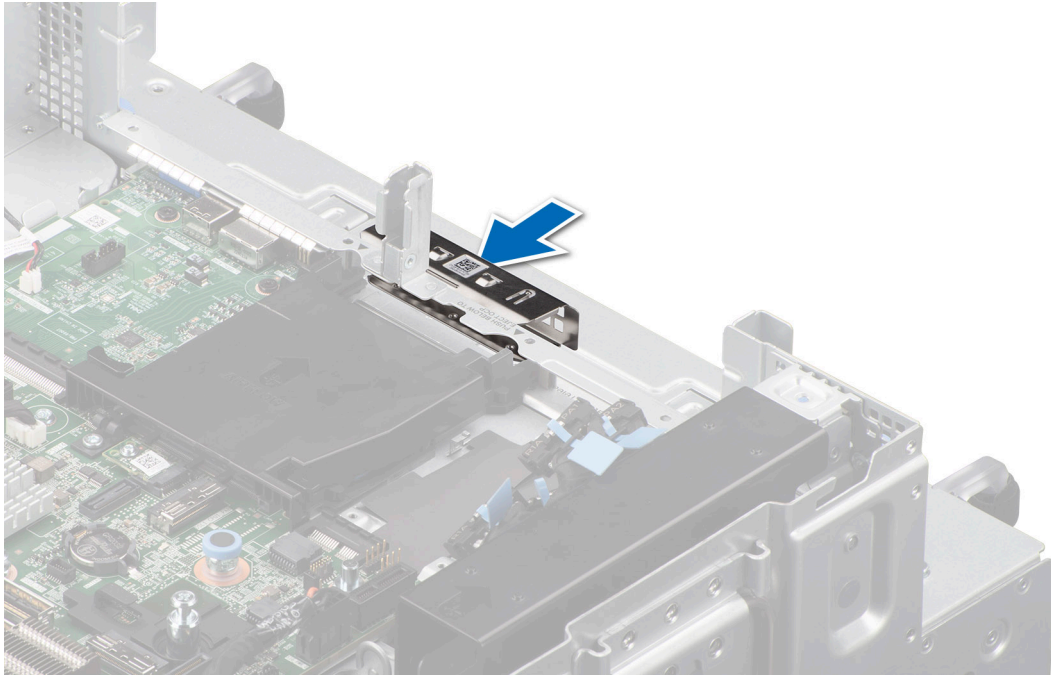
Figure 91. Installation of filler bracket

Next steps

Replace the OCP card.

Installing the OCP card

Prerequisites

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

⚠️ **CAUTION: Do not install GPUs, network cards, or other PCIe devices on your system that are not validated and tested by Dell. Damage caused by unauthorized and invalidated hardware installation will null and void the system warranty.**

Steps

1. If installed, remove the OCP filler bracket and OCP shroud.

   ⓘ **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.
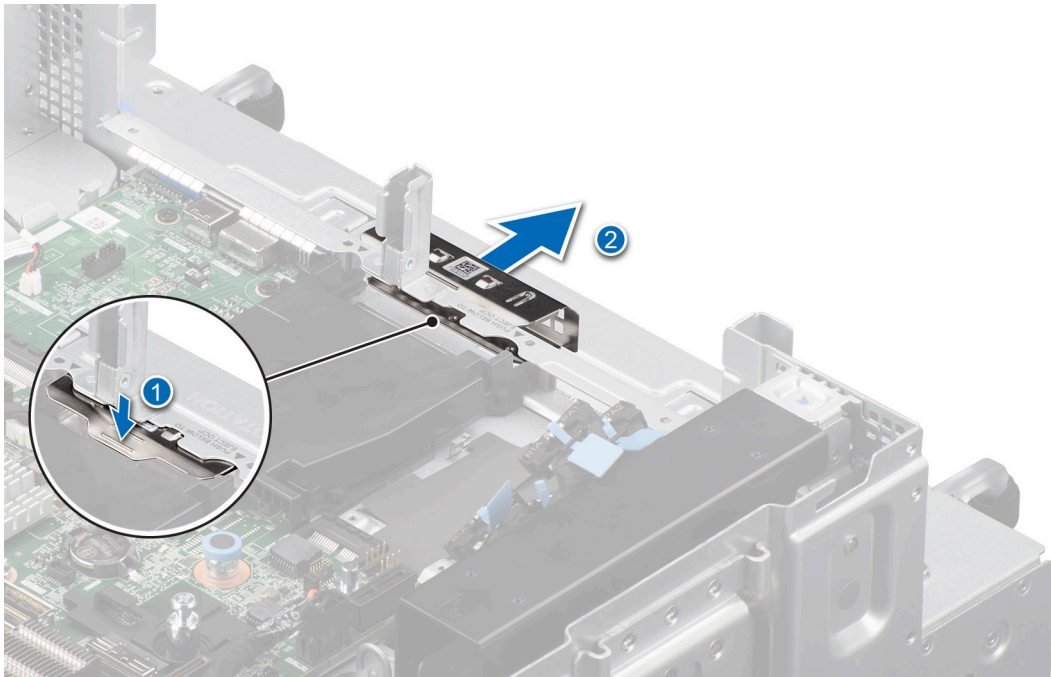
Figure 92. Remove the OCP filler bracket
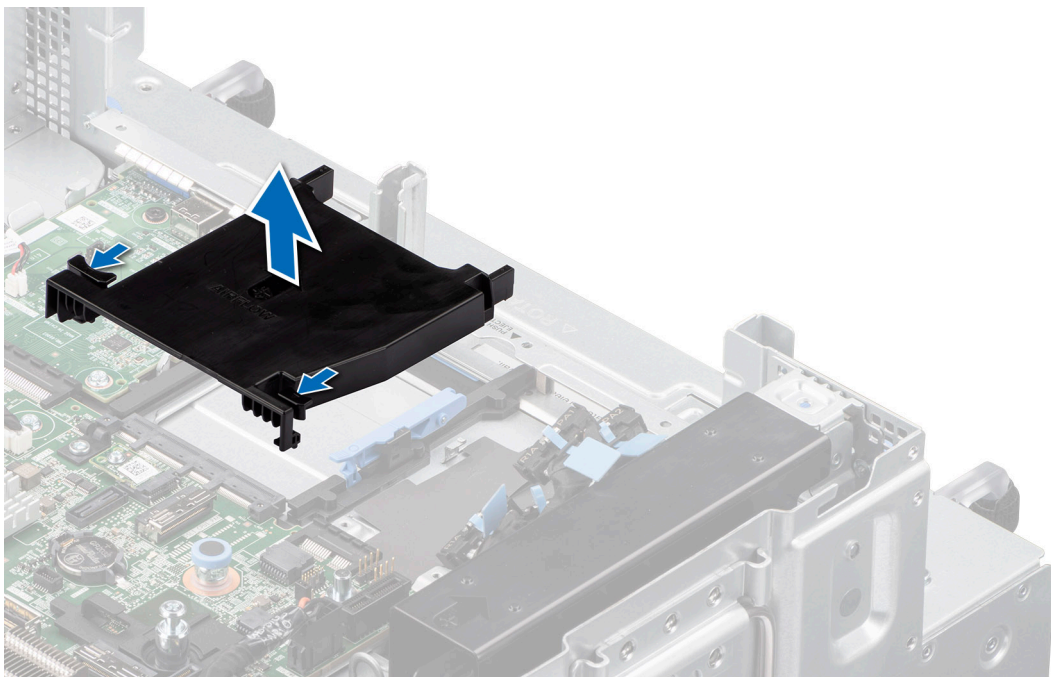
Figure 93. Removing the OCP shroud

2. Open the blue latch on the system board and slide the OCP card into the slot in the system.
3. Push until the OCP card is connected to the connector on the system board.
4. Close the blue latch to lock the OCP card to the system.

   (i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
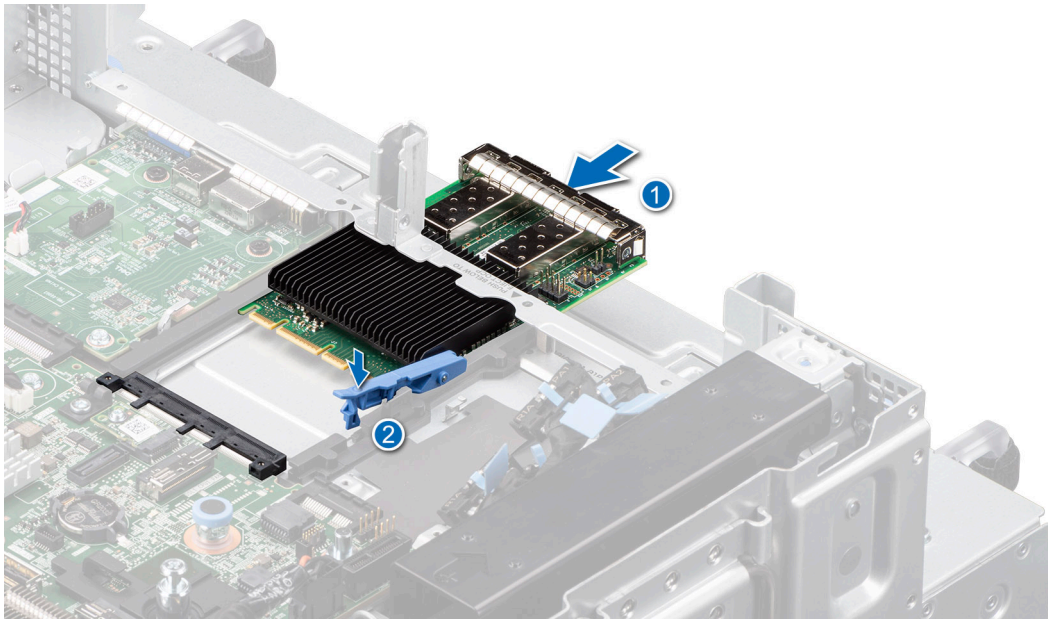
Figure 94. Installing the OCP card

Next steps

1. Replace the expansion risers.
2. Follow the procedure listed in After working inside your system.

LOM card and rear I/O board

Installing the LOM card and rear I/O 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 air shroud.
4. Remove the expansion card risers.

Steps

1. Align the connectors and slots on the LOM card or rear I/O board with the connector and standoffs on the system board.
2. Press the LOM card or rear I/O board until firmly seated on the system board connector.
3. Using a Phillips 2 screwdriver, secure the LOM card or rear I/O board to the system board with screws.
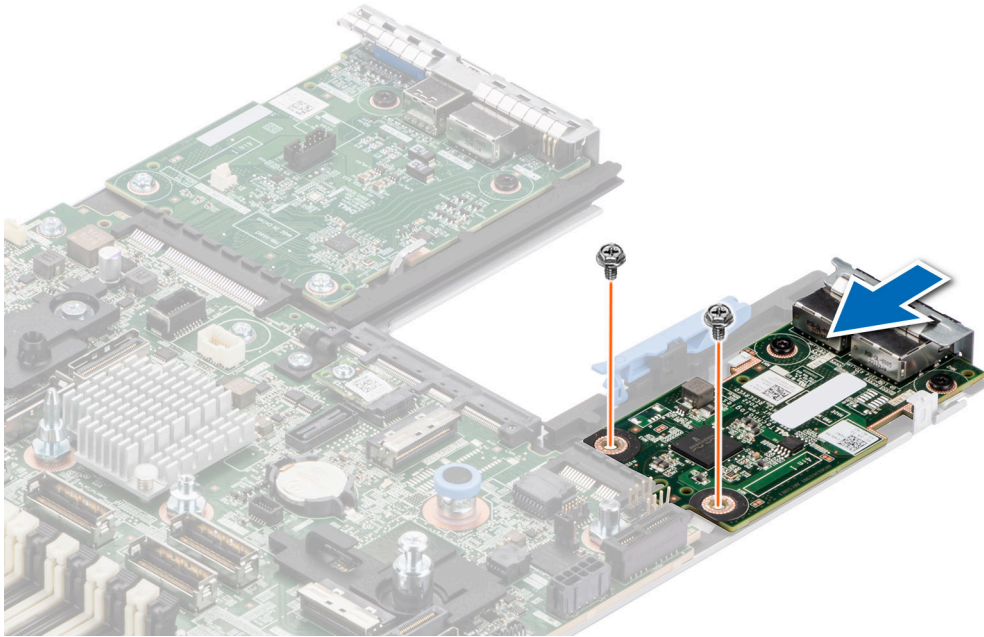
Figure 95. Installing the LOM card
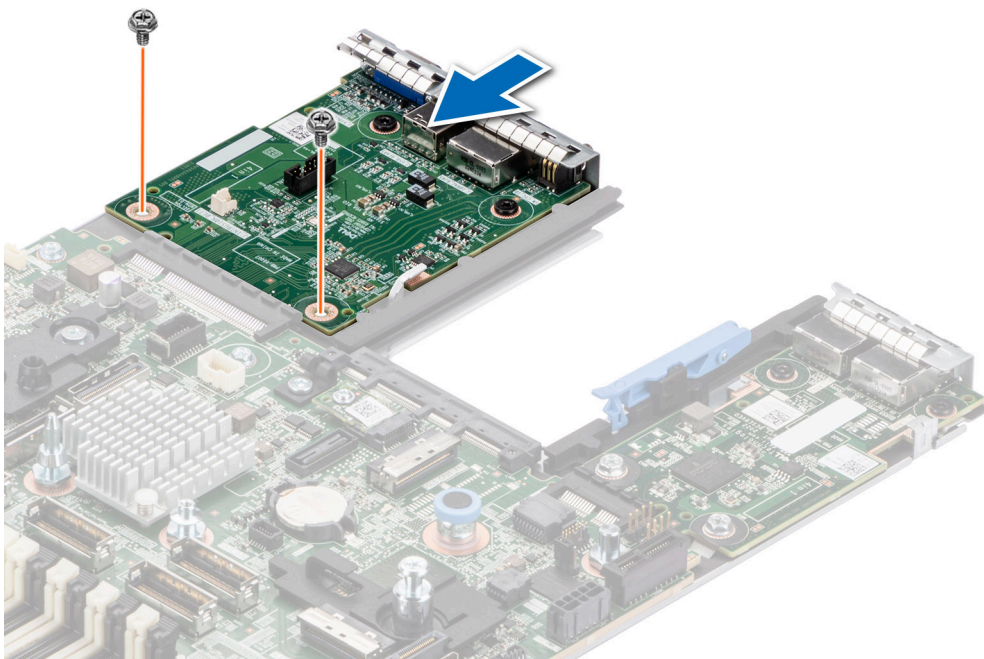
Figure 96. Installing the rear I/O board

Next steps

Follow the procedure listed in After working inside your system

Removing the LOM card and rear I/O 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 air shroud.
4. Remove the expansion card risers.

Steps

1. Using a Phillips 2 screwdriver, remove the screws that secure the LAN on Motherboard (LOM) card or rear I/O board to the system board.
2. Holding the edges, pull the LOM card or rear I/O board to disconnect from the connector on the system board.
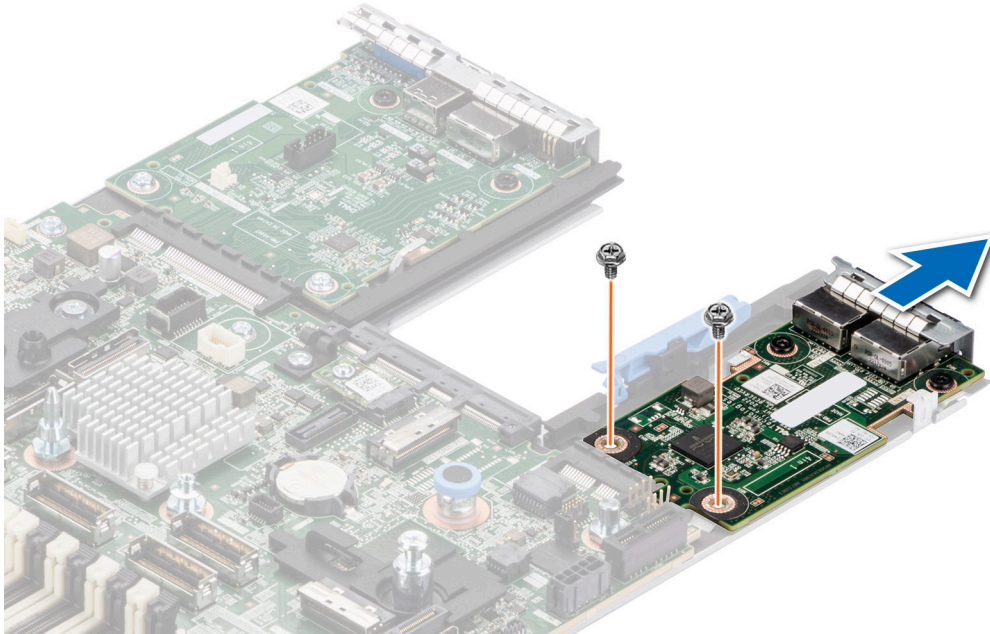
Figure 97. Removing the LOM card
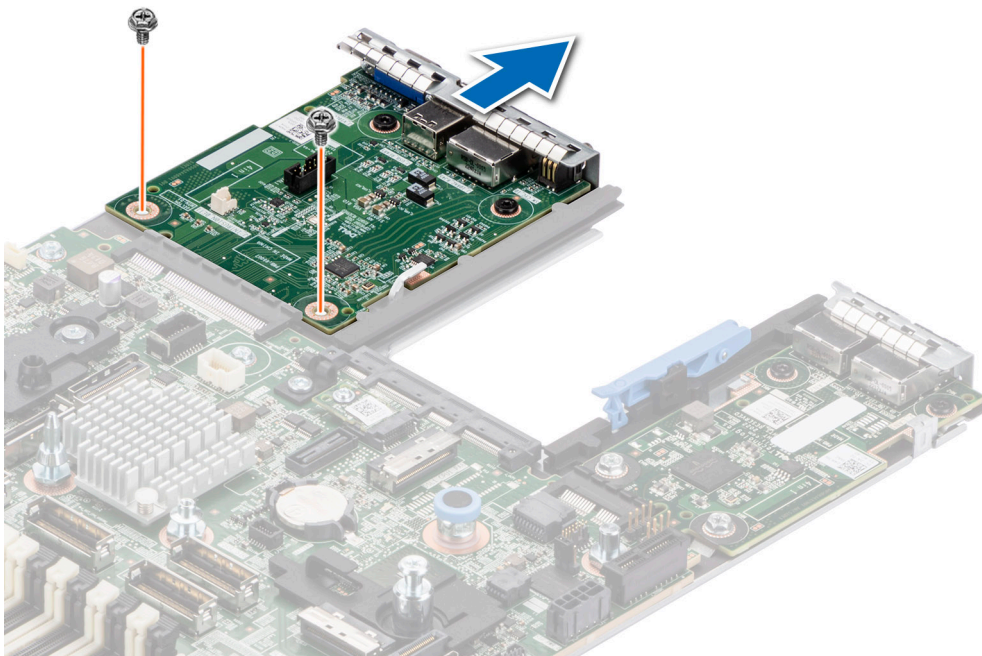
Figure 98. Removing the rear I/O board

Next steps

1. Replace the LOM card and rear I/O board.

Optional BOSS-N1 module

Removing the BOSS-N1 module blank

Prerequisites

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

Steps

Use a screwdriver to push out the blank from the BOSS-N1 module bay.
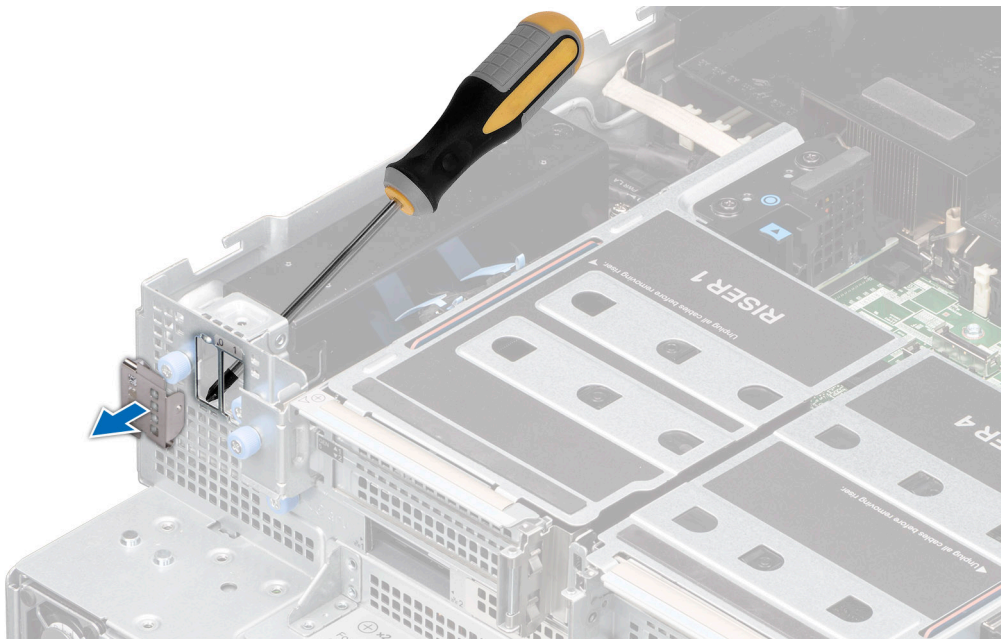
Figure 99. Removing the BOSS-N1 module blank

Next steps

Replace the BOSS-N1 module blank or install BOSS-N1 module

Installing the BOSS-N1 module blank

Prerequisites

Follow the safety guidelines listed in the Safety instructions

Steps

Align the blank with the BOSS-N1 module bay and push it into the bay until it clicks into place.
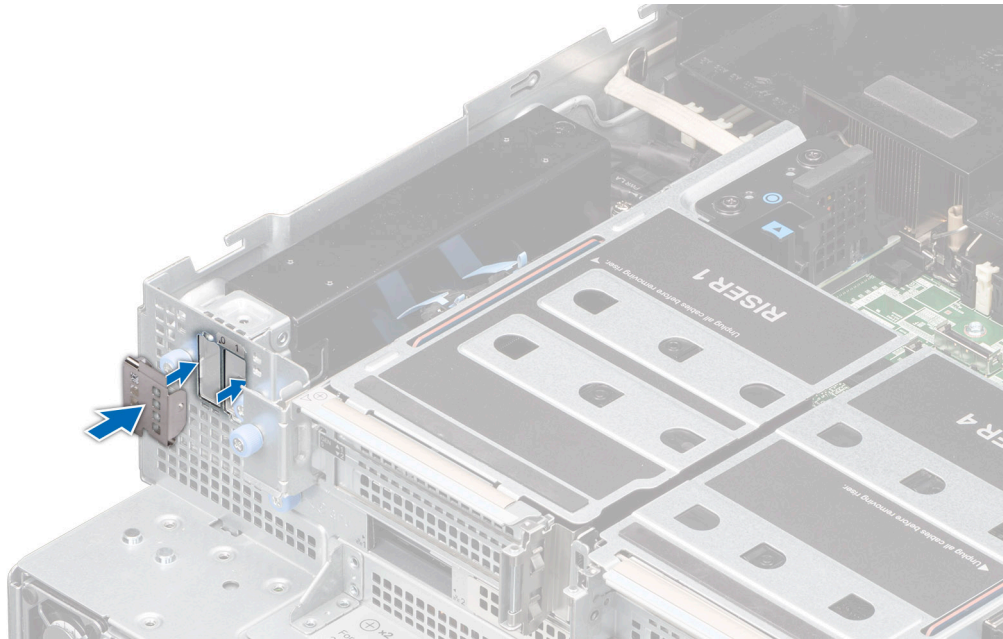
Figure 100. Installing the BOSS-N1 module blank

Removing the BOSS-N1 shroud

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. Slide the BOSS-N1 shroud towards to front of the system.
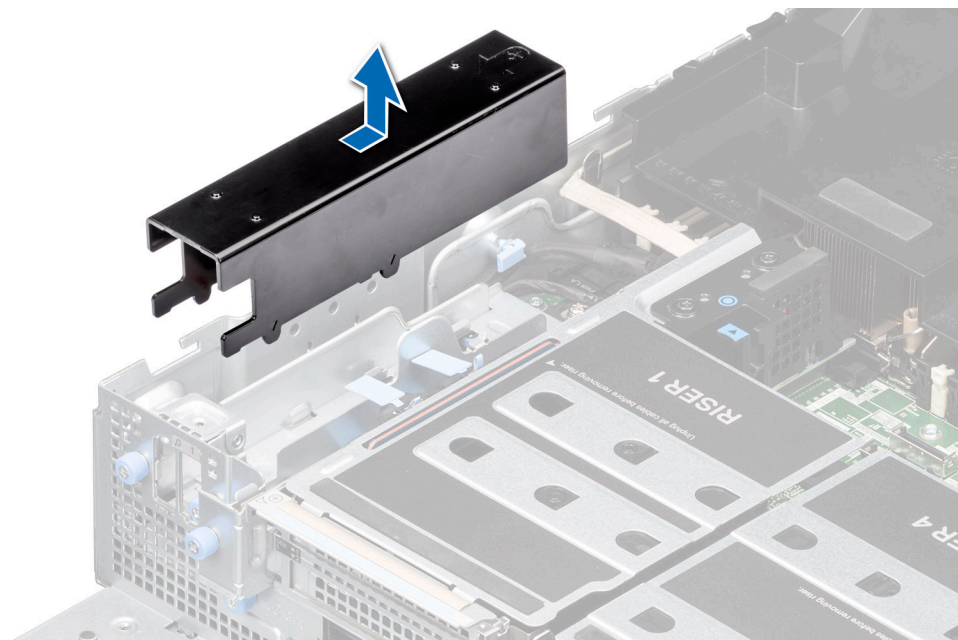
Figure 101. Removing the BOSS-N1 shroud

2. At a tilted angle, lift the BOSS-N1 shroud from the system.

Installing the BOSS-N1 shroud

Prerequisites

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

Steps

Align the BOSS-N1 shroud with the BOSS-N1 module bay, lower the shroud into the system and slide to the back of the system until it is firmly seated.
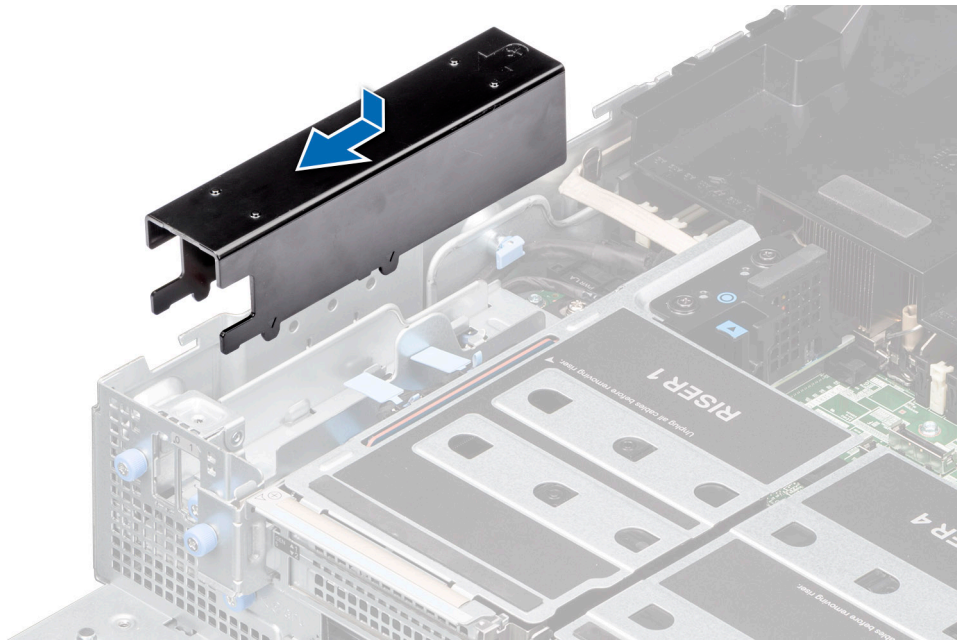
Figure 102. Installing the BOSS-N1 shroud

Next steps

Follow the procedure listed in After working inside your system

Removing the BOSS-N1 card carrier, M.2 SSD module and BOSS-N1 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. Remove the air shroud.

Steps

1. Pull and lift the BOSS-N1 card carrier retention latch lock to open.
2. Slide the BOSS-N1 card carrier out.
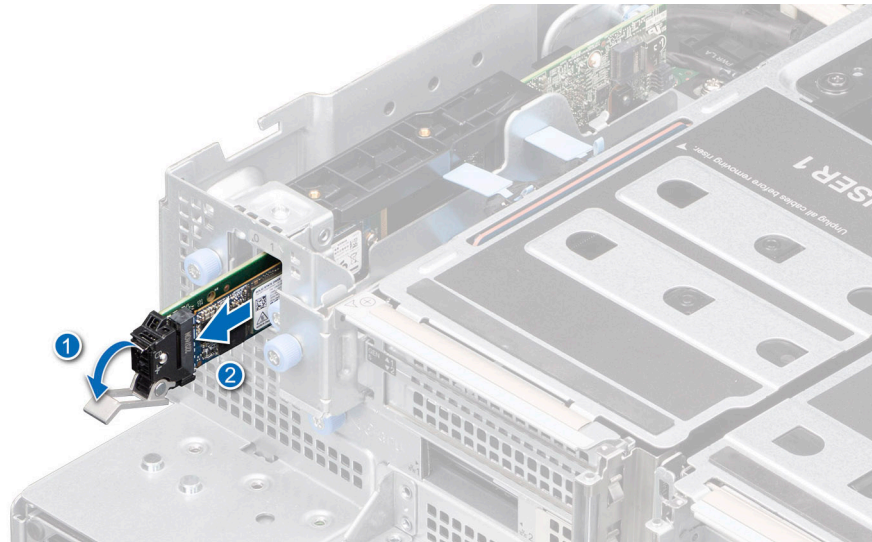
Figure 103. Removing the BOSS-N1 card carrier

3. Using the Phillips 1 screwdriver remove the M3 x 0.5 x 4.5 mm screw that secures the M.2 SSD module to the BOSS-N1 card carrier.
4. Slide the M.2 SSD module out from the BOSS-N1 card carrier.

Figure 104. Removing the M.2 SSD module

5. Disconnect the BOSS-N1 power and signal cable from the system board.
6. Remove the BOSS-N1 power and signal cable from the BOSS-N1 module.
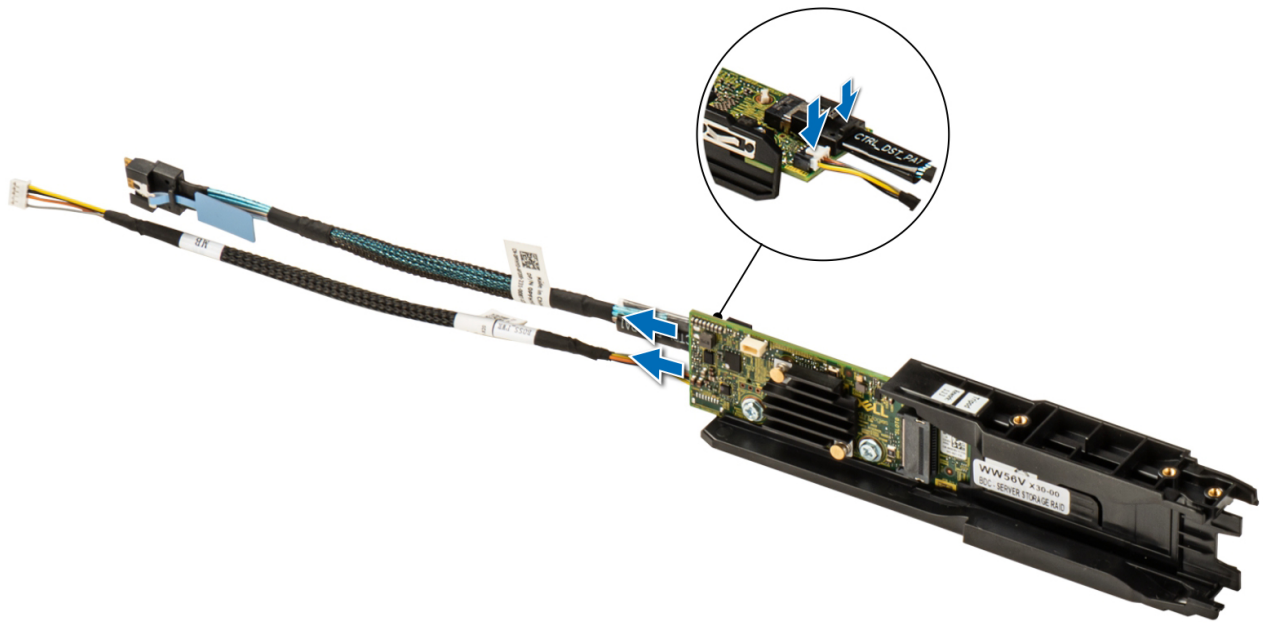
Figure 105. Removing the BOSS-N1 power and signal cable from the BOSS-N1 module

7. Using the Phillips 1 screwdriver remove the M3 x 0.5 x 4.5 mm screw that secures the BOSS-N1 module.
8. Slide the BOSS-N1 module toward the front of the chassis and lift the module.
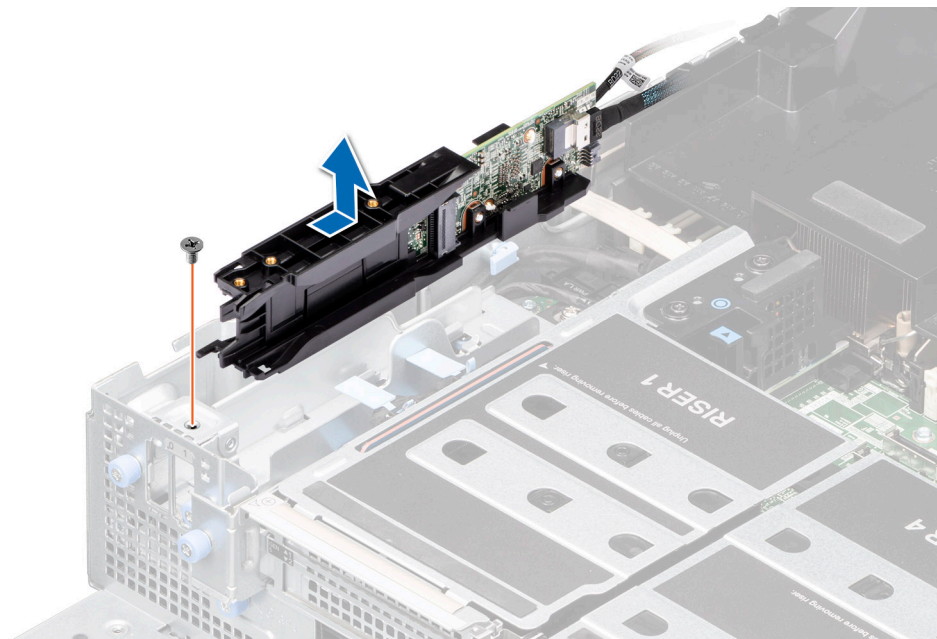
Figure 106. Removing the BOSS-N1 module

Next steps

1. Replace the BOSS-N1 module.

Installing the BOSS-N1 card, M.2 SSD module, BOSS-N1 card carrier

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 air shroud.

Steps

1. Align the BOSS-N1 module at an angle with the controller card module slot.
2. Insert the BOSS-N1 module and push the module horizontally toward the rear of the system until firmly seated.
3. Using the Phillips 1 screwdriver, secure the BOSS-N1 module with the M3 x 0.5 x 4.5 mm screw.
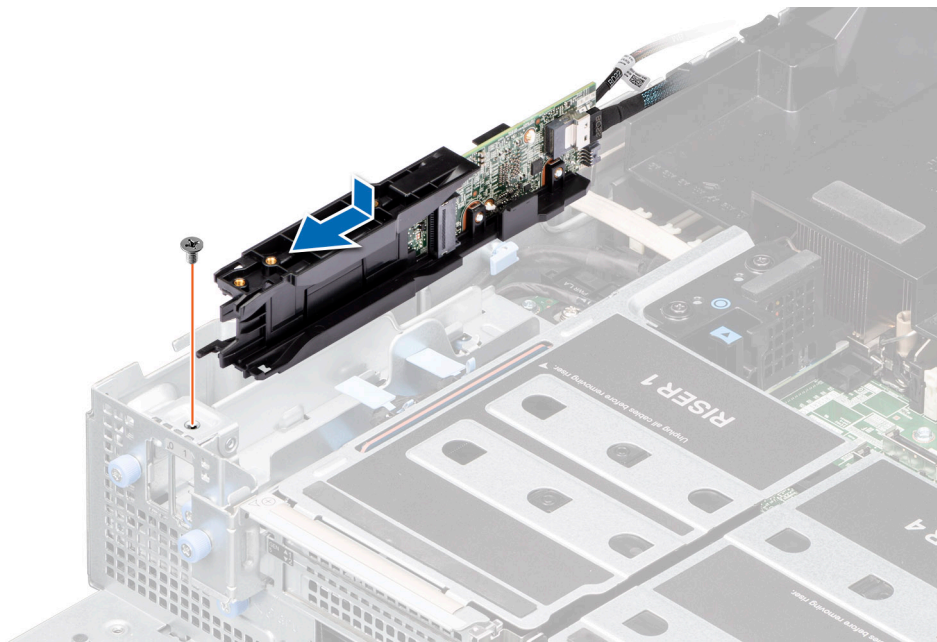
Figure 107. Installing the BOSS-N1 module

4. Connect the BOSS-N1 power and signal cables to the connectors on the BOSS-N1 module.
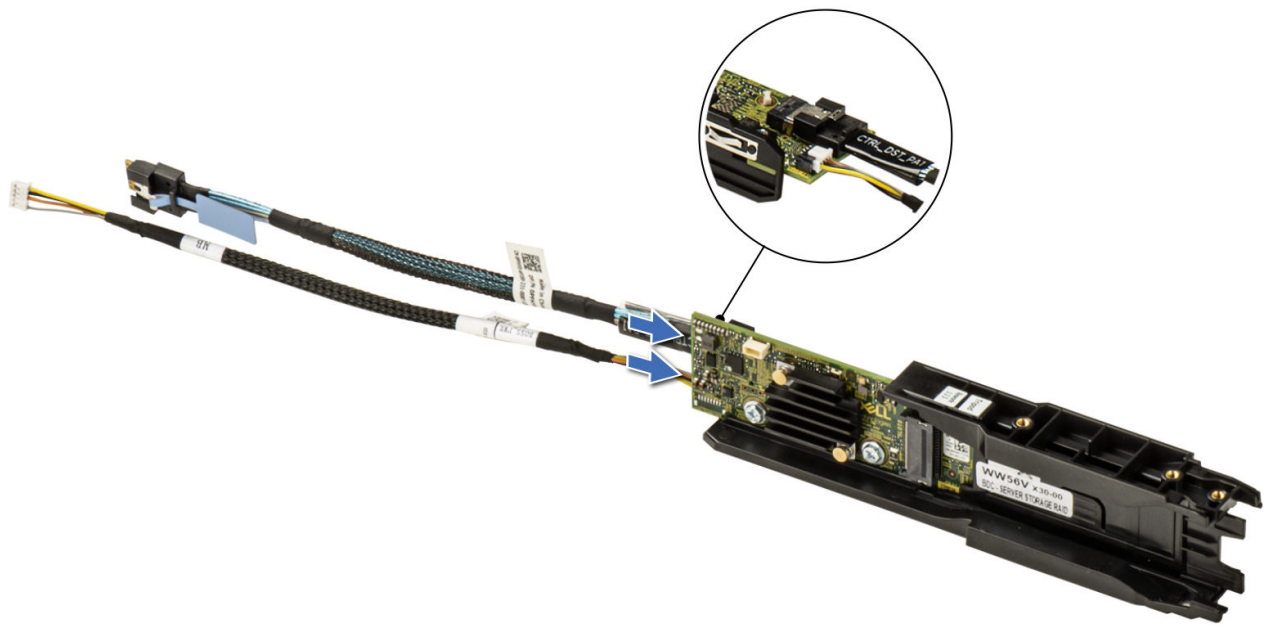
Figure 108. Connecting the BOSS-N1 power and signal cables to the BOSS-N1 module

5. Connect the BOSS-N1 power and signal cable to the connectors on the system board.
6. Align the M.2 SSD module at an angle with the BOSS-N1 card carrier.
7. Insert the M.2 SSD module until it is firmly seated in the BOSS-N1 card carrier.
8. Using the Phillips 1 screwdriver, secure the M.2 SSD module on the BOSS-N1 card carrier with the M3 x 0.5 x 4.5 mm screw.
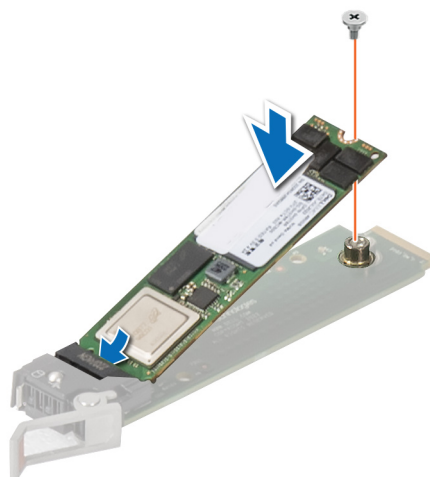
Figure 109. Installing the M.2 SSD module

9. Slide the BOSS-N1 card carrier into the BOSS-N1 module slot.
10. Close the BOSS-N1 card carrier release latch to lock the carrier in place.
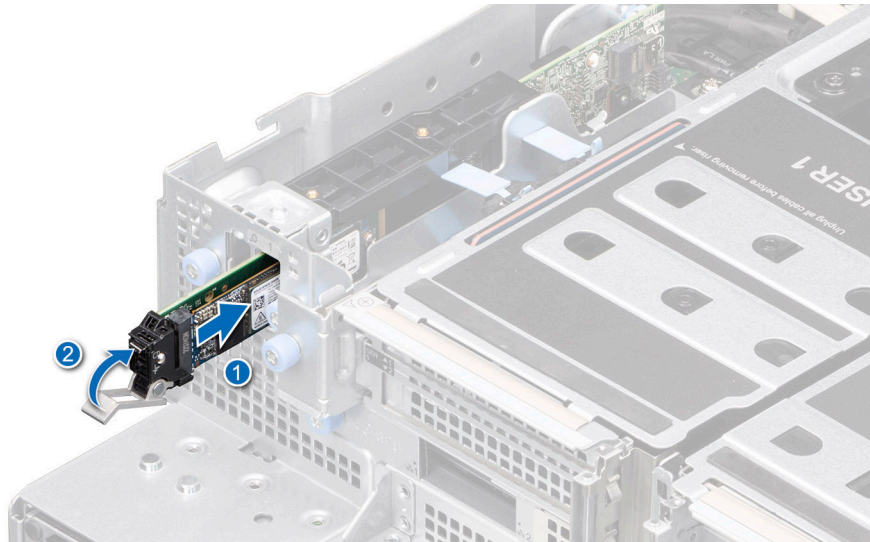
Figure 110. Installing the BOSS-N1 card carrier

Next steps

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

Removing the BOSS-N1 cage

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 expansion card riser 4A.

Steps

1. Using a Phillips 2 screwdriver, loosen the two blue thumb screws that secures the BOSS-N1 cage to the system.
2. Lift the BOSS-N1 cage away from the system.
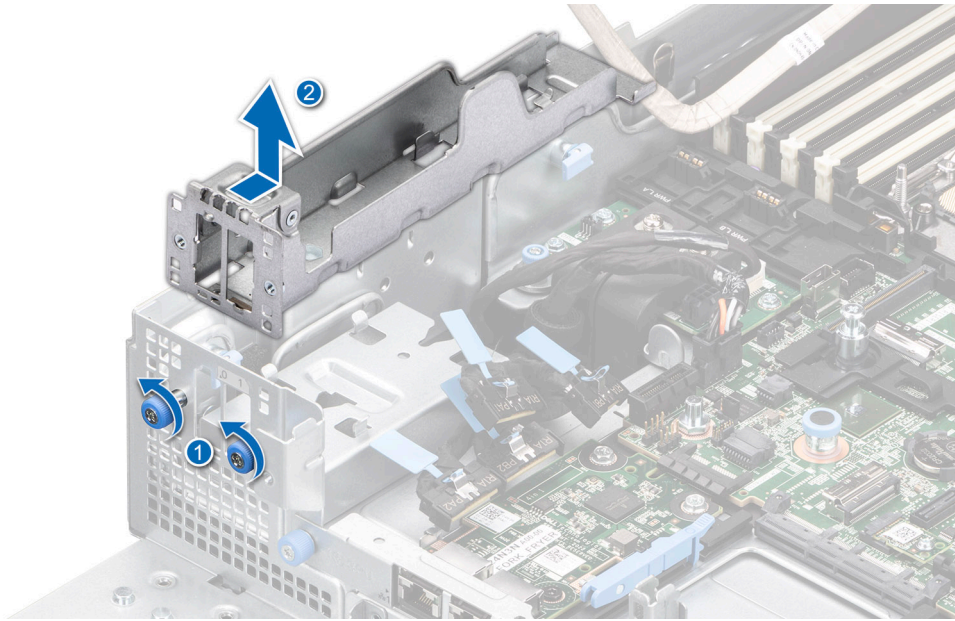
Figure 111. Removing the BOSS-N1 cage

Next steps

Replace the BOSS-N1 cage

Installing the BOSS-N1 cage

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 expansion card riser 4A.

Steps

1. Align and lower the BOSS-N1 cage into the system slots until it is firmly seated.
2. Tighten the two blue thumb screws to secures the BOSS-N1 cage.
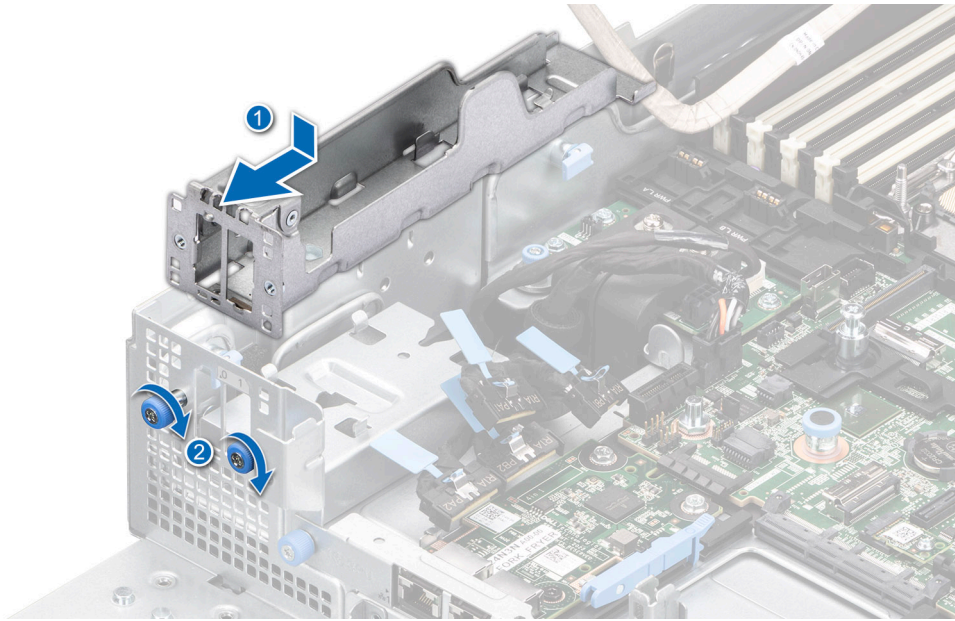
Figure 112. Installing the BOSS-N1 cage

Next steps

Follow the procedure listed in After working inside your system

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 updating to the latest firmware and changing the configuration, see the *Lifecycle Controller User's Guide* at https://www.dell.com/idracmanuals.

Hot spare feature

Your system supports the hot spare feature that significantly reduces the power overhead associated with the 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/poweredgemanuals.

Installing a power supply unit

Prerequisites

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

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

Steps

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

Figure 113. Installing a power supply unit

Next steps

1. If you have unlatched or removed the cable management accessory, reinstall or relatch it. For information about the cable management when the PSU is removed or installed while the system is in the rack, see the system's cable management accessory documentation at https://www.dell.com/poweredgemanuals.
2. Connect the power cable to the PSU, and plug the cable into a power outlet.

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

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

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. Disconnect the power cable from the power outlet and from the PSU that you intend to remove.
3. Remove the cable from the strap on the PSU handle.
4. Unlatch and lift or remove the optional cable management accessory if it interferes with the PSU removal.

(i) **NOTE:** For information about the cable management when the PSU is removed or installed while the system is in a rack, see the system's cable management arm documentation at https://www.dell.com/poweredgemanuals.

Steps

Press the release latch and holding the PSU handle, slide the PSU out of the bay.
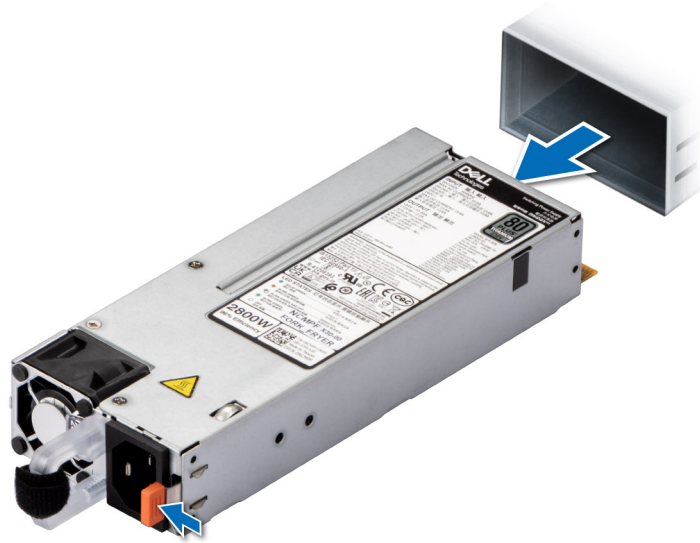
Figure 114. Removing a power supply unit

Next steps

1. Replace the PSU.

System battery

This is a service technician replaceable part only.

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 that is 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.

Steps

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

   ⚠️ **CAUTION: To avoid damage to the battery connector, you must firmly support the connector while installing or removing a battery.**
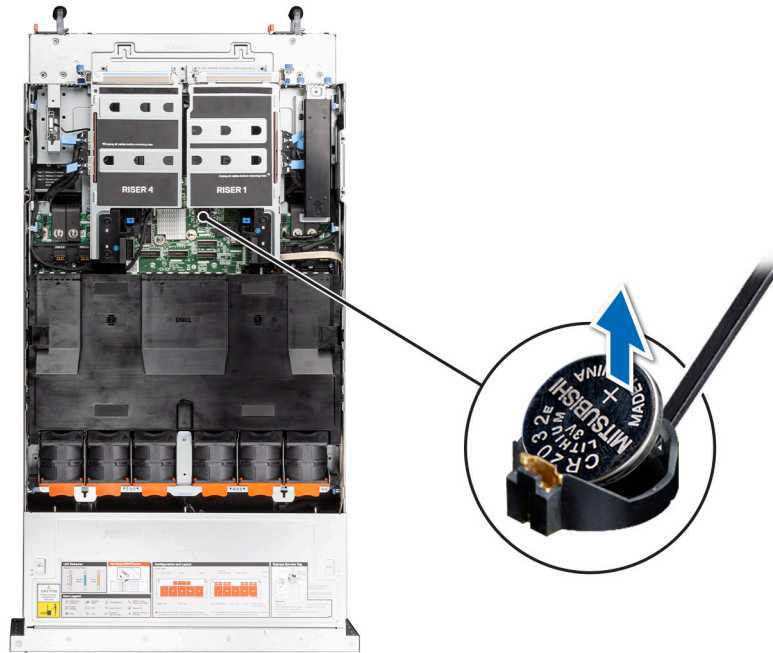
Figure 115. Removing the system battery

2. 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.
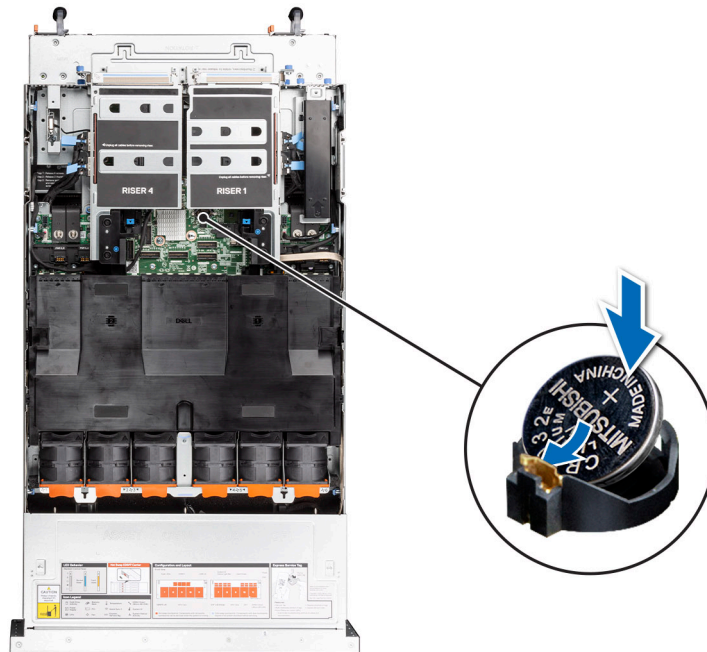
Figure 116. Installing the system battery

Next steps

1. Follow the procedure listed in After working inside your system.
2. 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, check the time and date at least an hour after installing the battery.

e. Enter the System Setup and if the time and date are still incorrect, see Getting help section.

Control panel

This is a service technician replaceable part only.

Removing the right 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 front top cover.
4. Remove the air shroud.
5. Remove the cooling fan and fan cage assembly.

Steps

1. Disconnect the right control panel cable and the VGA cable from the connectors on the system board.
2. Using the Phillips 1 screwdriver, remove the screws that secure the right control panel and cable cover to the system.
3. Remove the cable cover away from the system.
4. Holding the right control panel and VGA cable assembly, slide the right control panel out of the system.

   ⓘ **NOTE:** Observe the routing of the cable assembly as you remove the right control panel from the system.
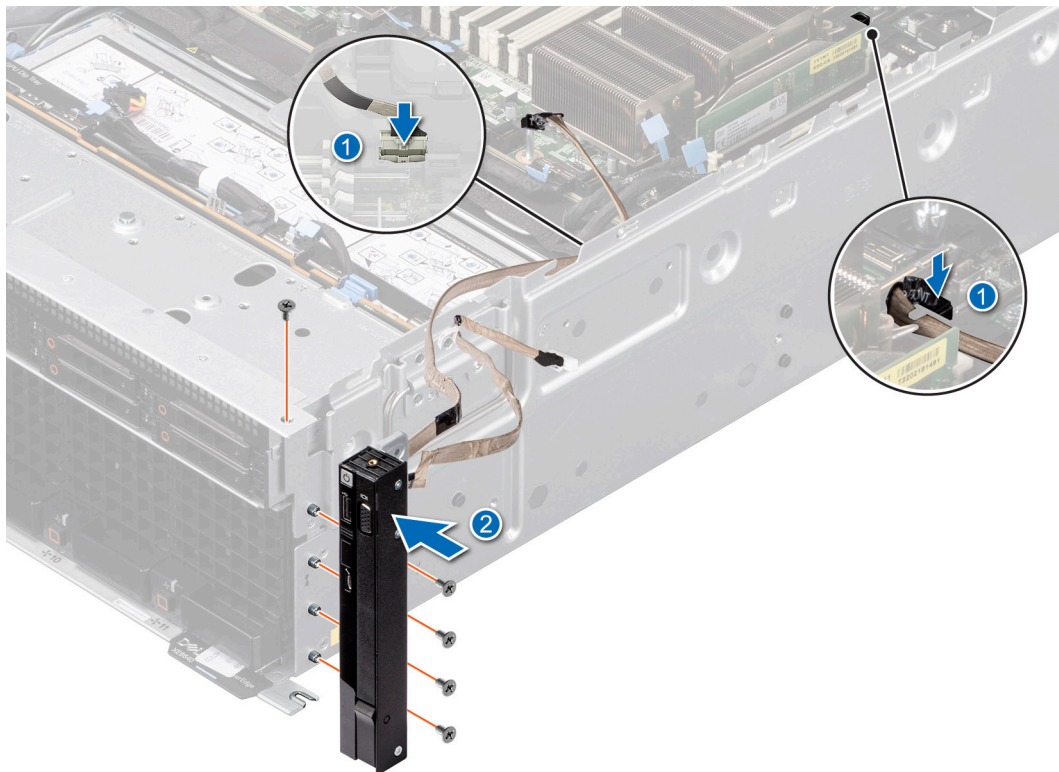
Figure 117. Removing the right control panel

Next steps

Replace the right control panel.

Installing the right control panel

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the front top cover.
4. Remove the air shroud.
5. Remove the cooling fan and fan cage assembly.

Steps

1. Align and slide the right control panel into the slot on the system.
2. Route the right control panel cable through the side wall of the system.
3. Align and slide the right control panel cable cover in the slot on the system.

   (i) **NOTE:** Route the cable properly to prevent the cable from being pinched or crimped.

4. Connect the right control panel cable and VGA cable to the connectors on the system board.
5. Using the Phillips 1 screwdriver, tighten the screws that secure the right control panel and the cable cover to the system.
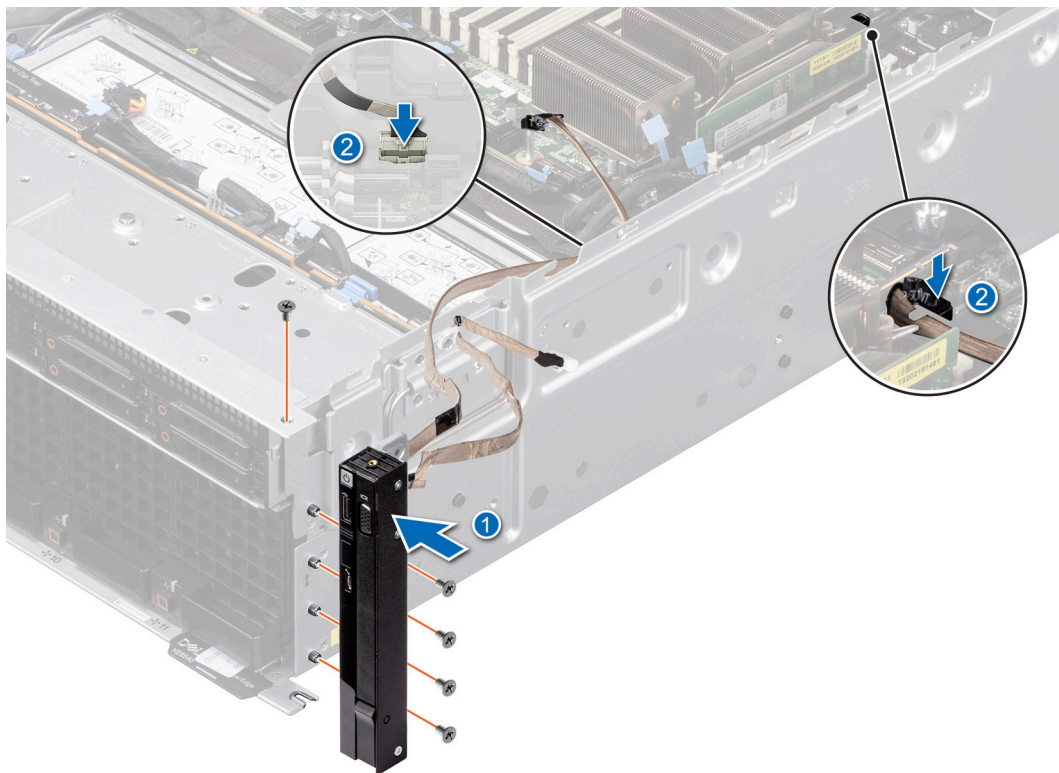
Figure 118. Installing the right control panel

Next steps

1. Replace the cooling fan cage assembly and fans.
2. Replace the air shroud
3. Replace the front top cover.
4. Follow the procedure listed in After working inside your system.

Removing the left 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 front top cover.
4. Remove the air shroud.
5. Remove the cooling fan and fan cage assembly.

Steps

1. Disconnect the right control panel cable and the VGA cable from the connectors on the system board.
2. Using the Phillips 1 screwdriver, remove the screws that secure the right control panel and cable cover to the system.
3. Remove the cable cover away from the system.
4. Holding the cable, slide the left control panel out of the system.

   (i) **NOTE:** Observe the routing of the cable as you remove the left control panel from the system.
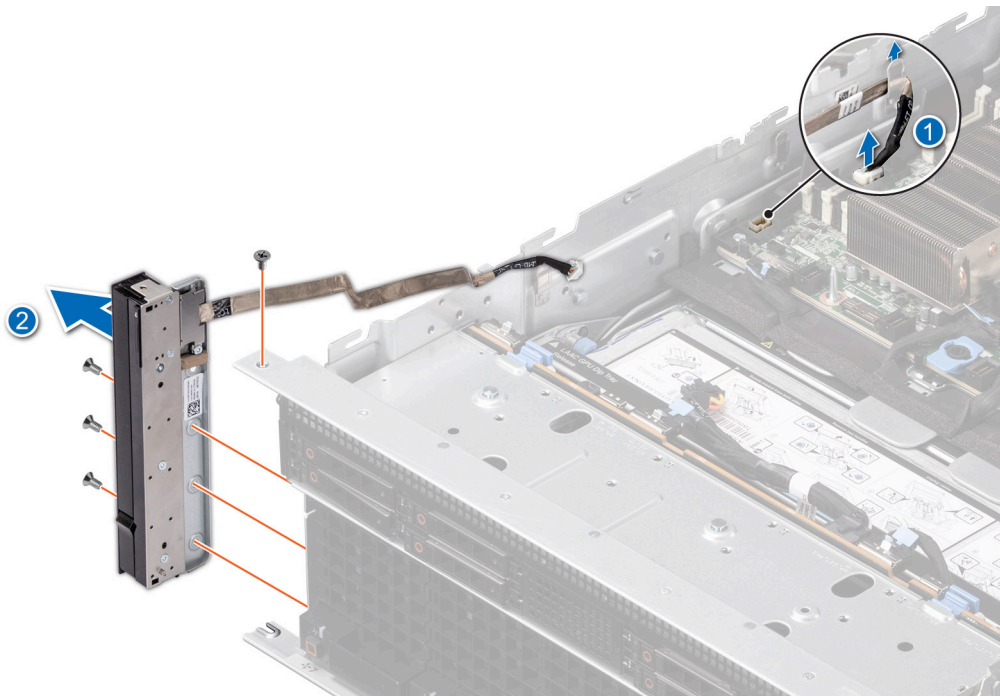
Figure 119. Removing the left control panel

Next steps

Replace the left control panel.

Installing the left control panel

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the front top cover.
4. Remove the air shroud.
5. Remove the cooling fan and fan cage assembly.

Steps

1. Align and slide the left control panel in the slot on the system.
2. Route the left control panel cable through the side wall of the system.
3. Align and slide the left control panel cable cover in the slot on the system.

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

4. Connect the left control panel cable to the connector on the system board .
5. Using the Phillips 1 screwdriver, tighten the screws to secure the left control panel and the cable cover to the system.
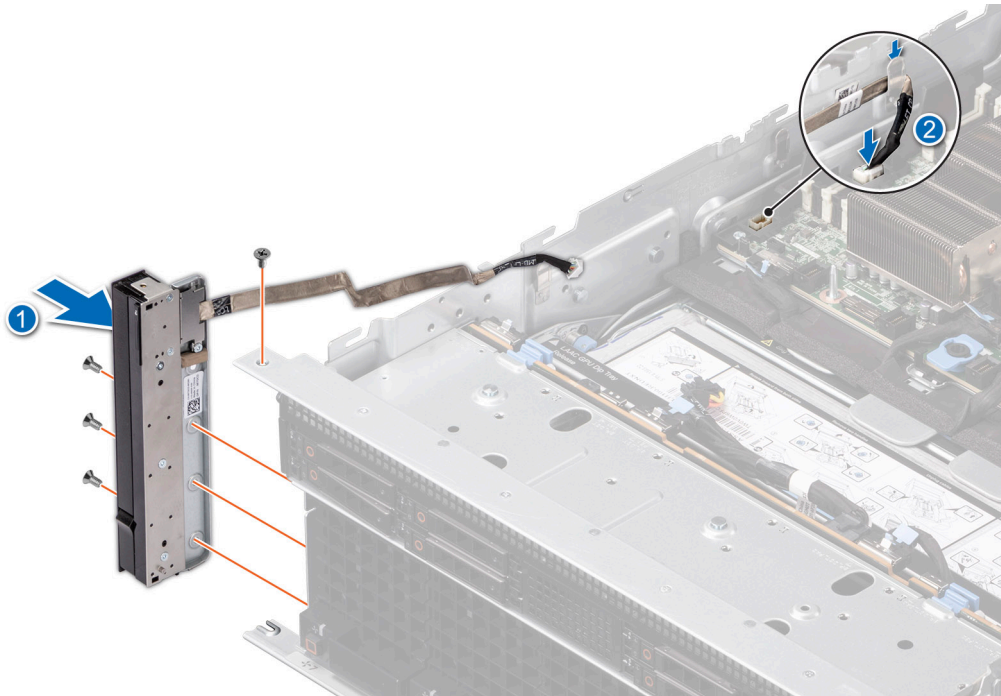
Figure 120. Installing the left control panel

Next steps

1. Replace the cooling fan cage assembly and fans.
2. Replace the air shroud
3. Replace the front top cover.
4. Follow the procedure listed in After working inside your system.

Versabay board (VSB)

Removing the VSB

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 air shroud
4. Remove the expansion card risers.

Steps

1. Remove the screws to disengage the VSB cable from the VSB board connected to the system board.
2. Disconnect the signal cable from the VSB.

3. Disconnect the power cable and keep it away from the system.
4. Lift the plunger and slide the VSB tray to rear of the system.
5. Disengage the VSB tray from the system board and lift it out of the system.

   (i) **NOTE:** The procedure to remove the left and right VSB is similar.
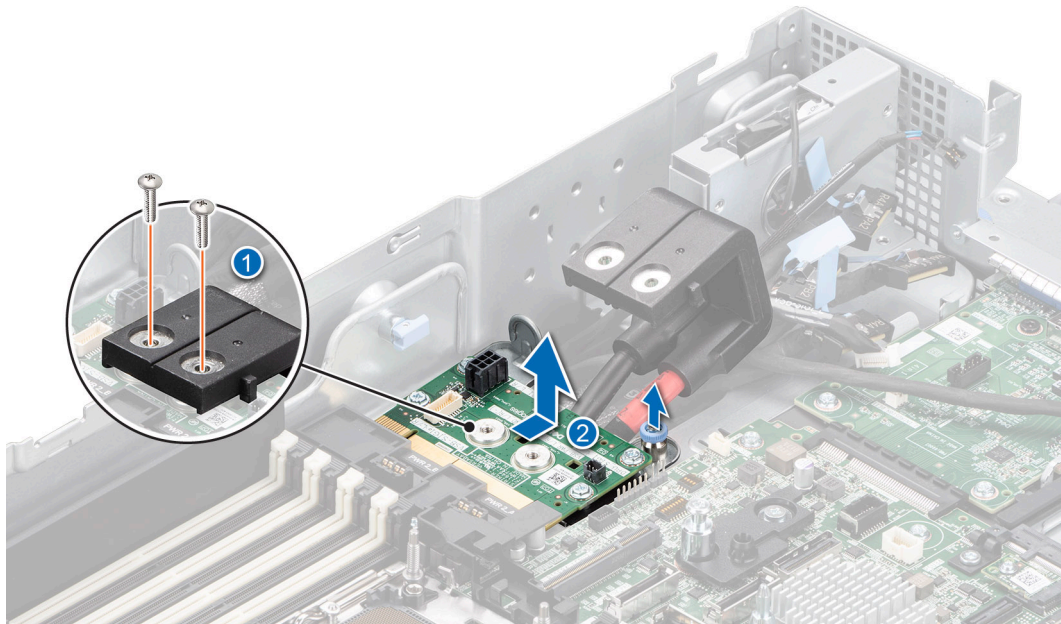
Figure 121. Removing the VSB with the tray

6. Remove all the screws and lift the VSB from the VSB tray.
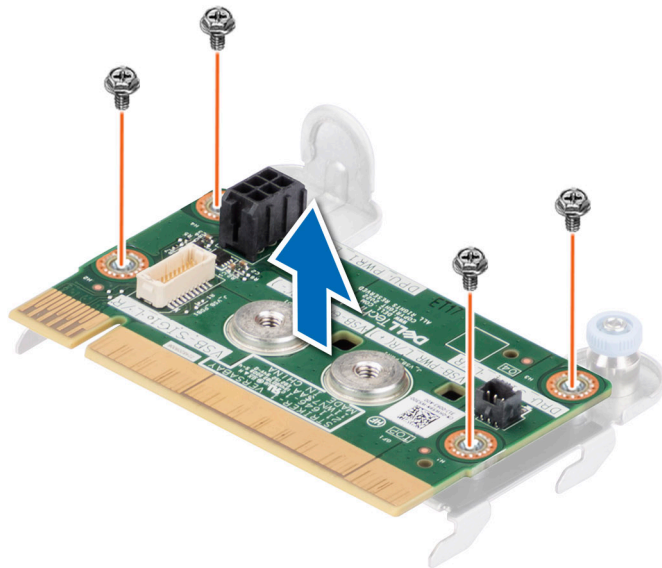
Figure 122. Removing the VSB from VSB tray

Next steps

Replace the Versabay assembly.

Installing the VSB

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 air shroud.
4. Remove the expansion card risers.

Steps

1. Align the VSB on the tray and tighten the screws to secure the VSB on to the VSB tray.
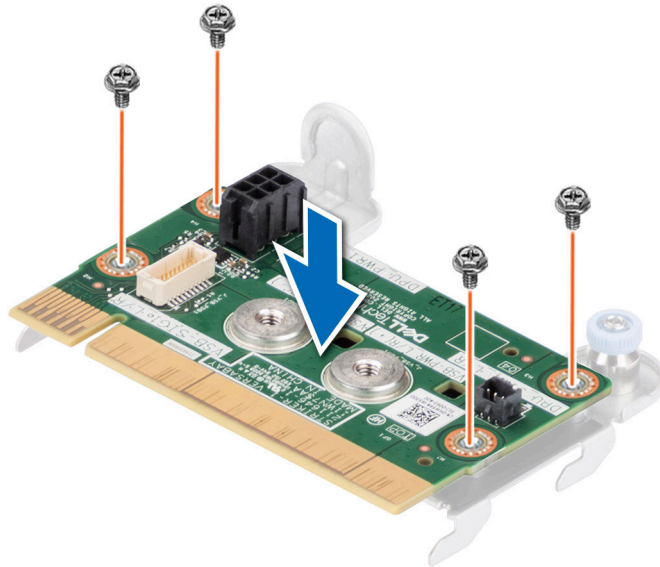
Figure 123. Installing the VSB on to VSB tray

2. Lift the plunge, align the VSB tray to the system board and slide it toward the front of the system.
3. Connect the signal cable on the VSB.
4. Align the power cable to the VSB and secure the cables with the screws.

   ⓘ **NOTE:** The procedure to install the left and right VSBs are same.
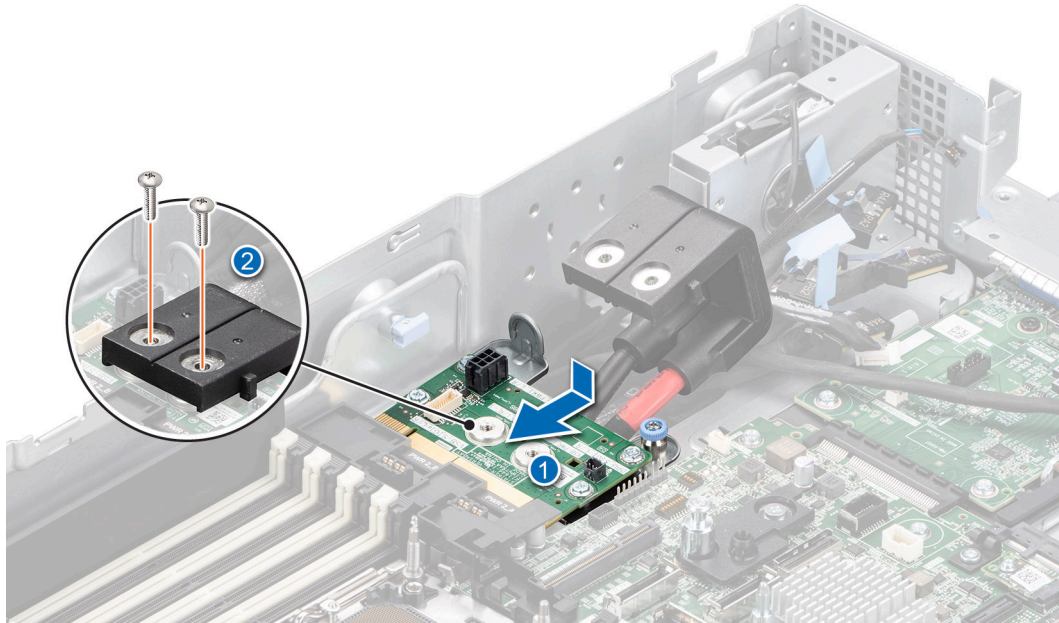
Figure 124. Installing the VSB with the tray

Next steps

1. Install the expansion card risers.
2. Install the air shroud.
3. Follow the procedure listed in After working inside your system.

System board

This is a service technician replaceable part only.

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. Air shroud.
   b. Front top cover.
   c. Cooling fan.
   d. Cooling fan cage.
   e. Expansion card risers 1 and 4.
   f. BOSS-N1 shroud
   g. BOSS-N1 card carrier, M.2 SSD module, BOSS-N1 card
   h. BOSS-N1 cage
   i. Memory modules.
   j. Heat sink.
   k. Processors.

l. intrusion switch

m. OCP card (if installed).

n. Disconnect all the cables from the system board and make note of all the cable connections.

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

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

Steps

1. Using the system board holder and plunger, slide the system board toward the front of the system.
2. At a tilted angle, lift the system board out of the chassis.
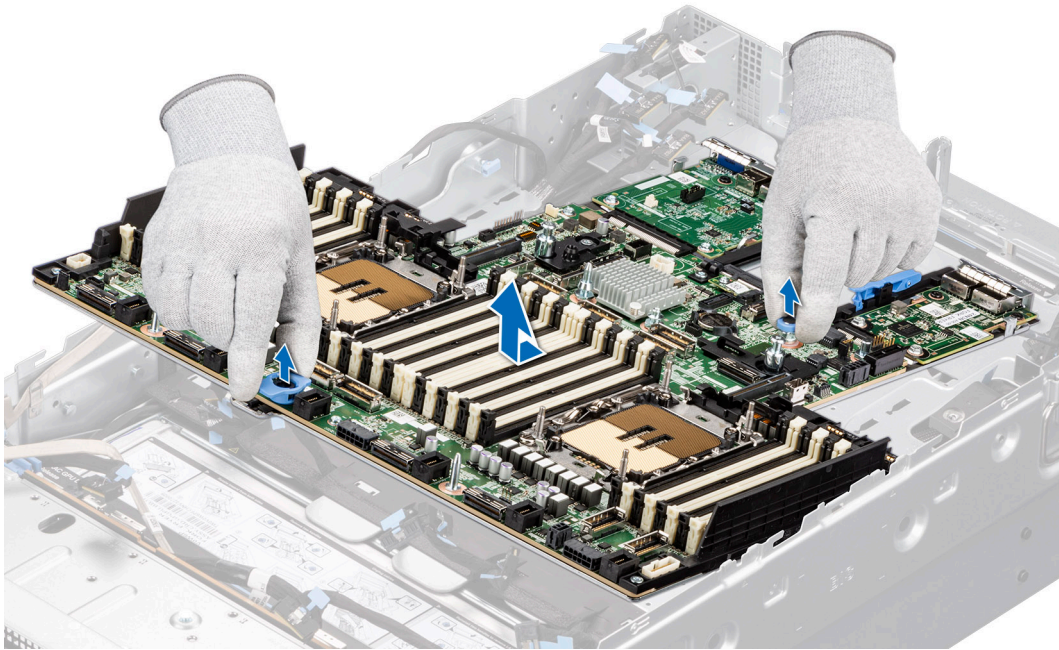
Figure 125. Removing the system board

Next steps

1. Install the system board.

Installing the system board

Prerequisites

> ⓘ **NOTE:** Before replacing the system board, replace the old iDRAC MAC address label on the Express Service 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 the 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. Hold the blue plastic handle and sheet metal handle on the system board and place it onto the chassis.
3. Align the guiding features with their corresponding marks on the chassis.
4. Hold onto the blue plastic handle with one hand and use the other hand to push the plunger, sliding the system board towards the rear of the chassis until it clicks and locks plunger.

   ⓘ **NOTE:** Ensure the plunger is locked.
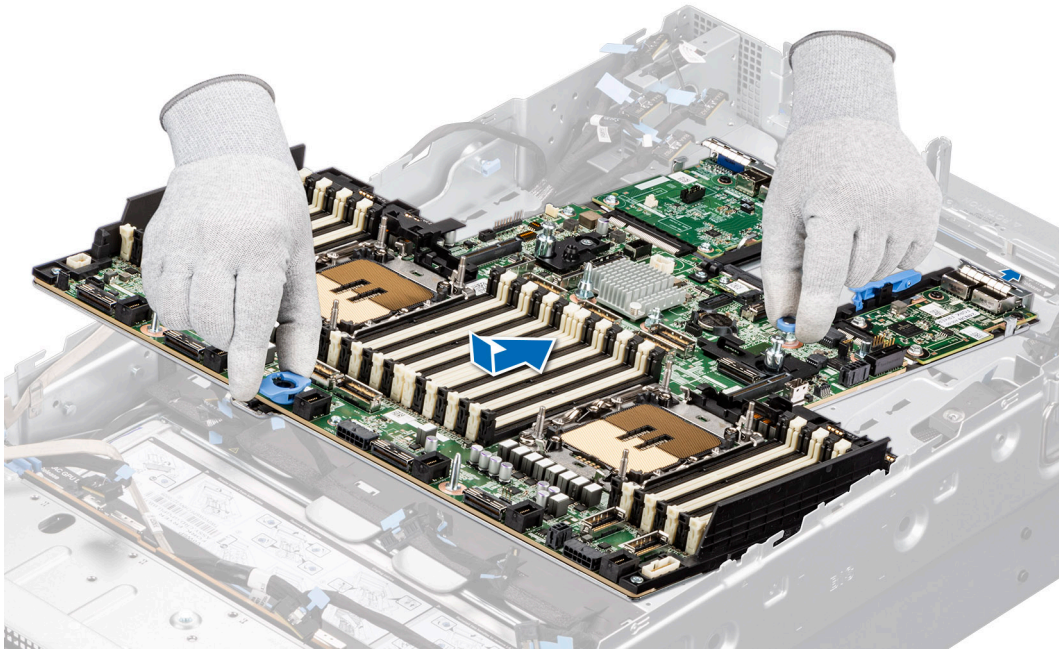
Figure 126. Installing the system board

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. OCP card (if install)
   c. OCP shroud (if install)
   d. Intrusion switch
   e. Processor
   f. Heat sink module
   g. Memory modules
   h. Expansion card risers 1 and 4
   i. BOSS-N1 cage
   j. BOSS-N1 card, M.2 SSD module, BOSS-N1 card carrier
   k. BOSS-N1 shroud
   l. Cooling fan cage
   m. Cooling fan
   n. Front top cover
   o. Air shroud
   p. Observe and connect the cables to the connectors on the power distribution board.
   q. 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.

   r. Power supply units (PSU)

2. 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.
    d. Re-enable the Trusted Platform Module (TPM). See the Upgrading the Trusted Platform Module section.
3. If you are not using Easy Restore, import your new or existing iDRAC Enterprise license. For more information, see the *Integrated Dell Remote Access Controller User's Guide* available at https://www.dell.com/idracmanuals.
4. Follow the procedure listed in After working inside your system.

Restoring the system using Easy Restore

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

About this task

Below is a list of options/steps available:

Steps

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**

   (i) **NOTE:** When the restore process is complete, BIOS prompts to restore the system configuration data.

4. Restore data from a previously created **Hardware Server Profile**, press **F10**
5. To restore the system configuration data, press **Y**
6. To use the default configuration settings, press **N**

   (i) **NOTE:** After the restore process is complete, system reboots.

Manually update the Service Tag

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

About this task

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

Steps

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

   (i) **NOTE:** You can enter the service tag only when the **Service Tag** field is empty. Ensure that you enter the correct service tag. Once the service tag is entered, it cannot be updated or changed. Incorrectly entered service tag will lead to system board replacement.

5. Click **OK**.

System board tray

Removing the system board tray

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 air shroud.
4. Remove the front top cover.
5. Remove the cooling fan and fan cage assembly.
6. Remove the expansion card risers.
7. Remove the memory modules.
8. Remove the heat sink.
9. Remove the processors.
10. Remove the OCP card (if installed).
11. Remove the power supply units (PSU).
12. Remove the VSB
13. Disconnect cables that are connected to the components.
14. Remove the system board

Steps

1. Unlock the blue release plunger to unlock the system board tray from the chassis
2. Hold the blue release plunger, and lift the system board tray away from the chassis.
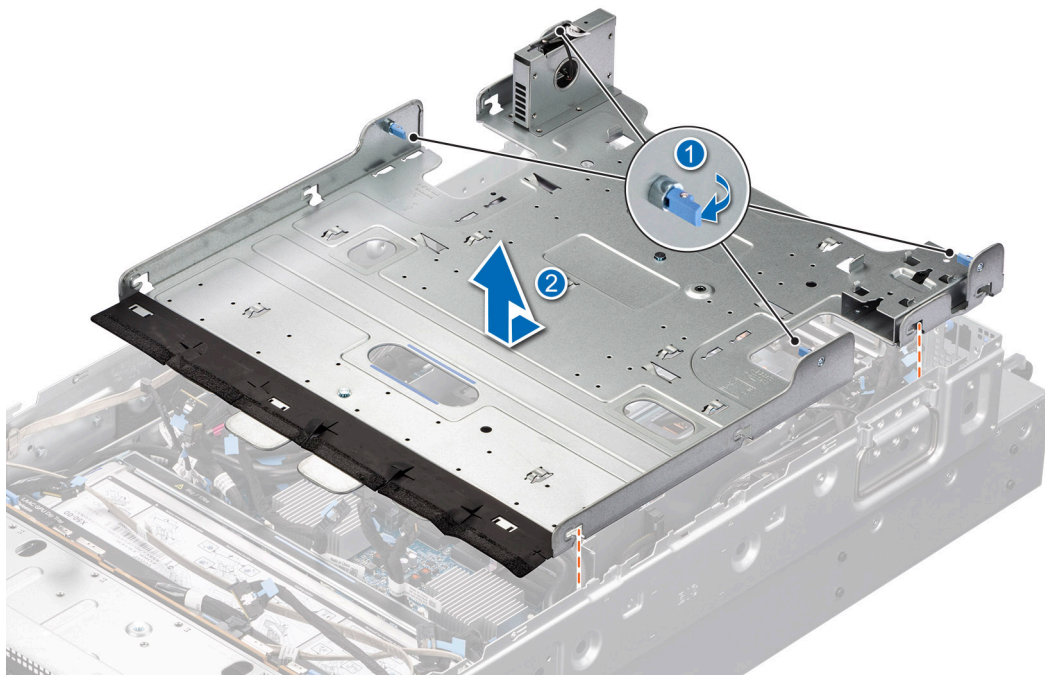
Figure 127. Removing the system board tray

Next steps

1. Replace the system board tray.

Installing the system board tray

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 air shroud.
4. Remove the front top cover.
5. Remove the cooling fan and fan cage assembly.
6. Remove the expansion card risers.
7. Remove the memory modules.
8. Remove the heat sink.
9. Remove the processors.
10. Remove the OCP card (if installed).
11. Remove the power supply units (PSU).
12. Remove the VSB
13. Disconnect cables that are connected to the components.
14. Remove the system board

Steps

1. Holding the system board tray, align the holes on the system board tray with the guides on the chassis to ensure correct orientation.
2. Lower the system board tray into place and press the touch points until the tray is fully seated on the chassis.
3. Flip in the blue release plunger to lock the system board tray to the chassis.
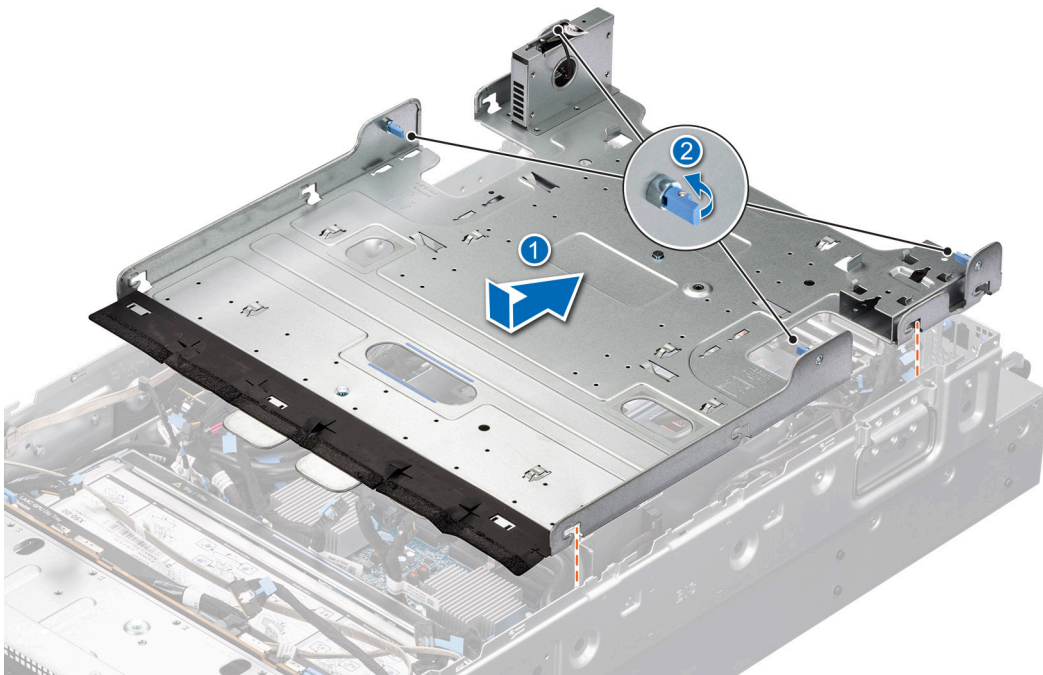
Figure 128. Installing the system board tray

Next steps

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

LAAC GPU Dip tray

Removing the LAAC GPU tray

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 air shroud.
4. Remove the front top cover.
5. Remove the cooling fan and fan cage assembly.
6. Remove the expansion card risers.
7. Remove the memory modules.
8. Remove the heat sink.
9. Remove the processors.
10. Remove the OCP card (if installed).
11. Remove the power supply units (PSU).
12. Remove the VSB
13. Disconnect cables that are connected to the components.
14. Remove the system board
15. Remove the system board tray.

Steps

1. Using a Phillips 2 screwdriver, loosen the two blue thumb screws on both sides of the GPU assembly.
2. Hold the two blue thumb screws and rotate the GPU assembly toward the rear of the system.
3. Lift the black latch and disconnect the GPU cable connecting on the NVlink baseboard.
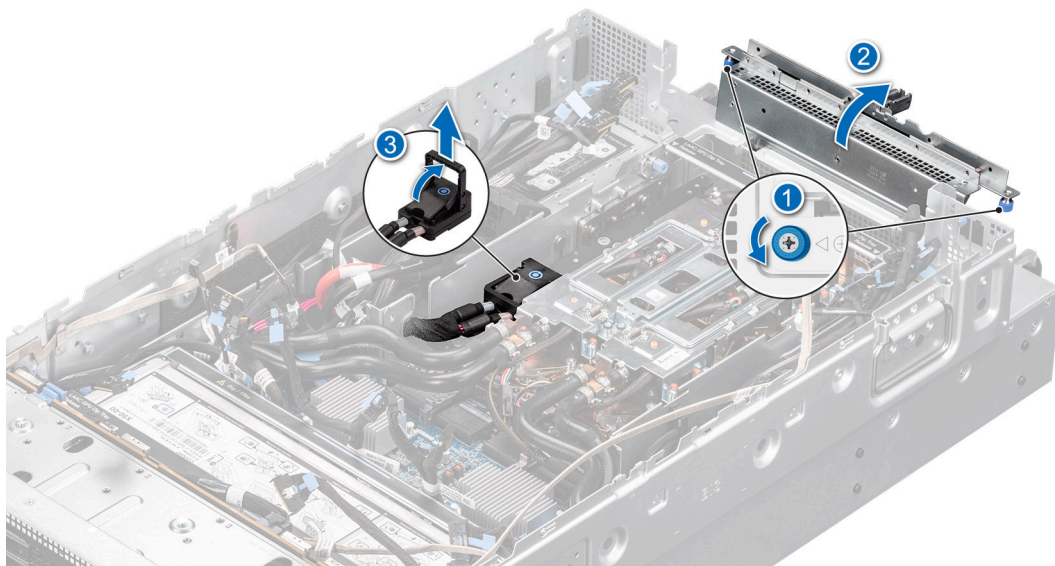
Figure 129. Removing the GPU assembly and cable

4. Observe and disconnect the cables from the LAAC GPU Tray connector from the PDB and backplane.
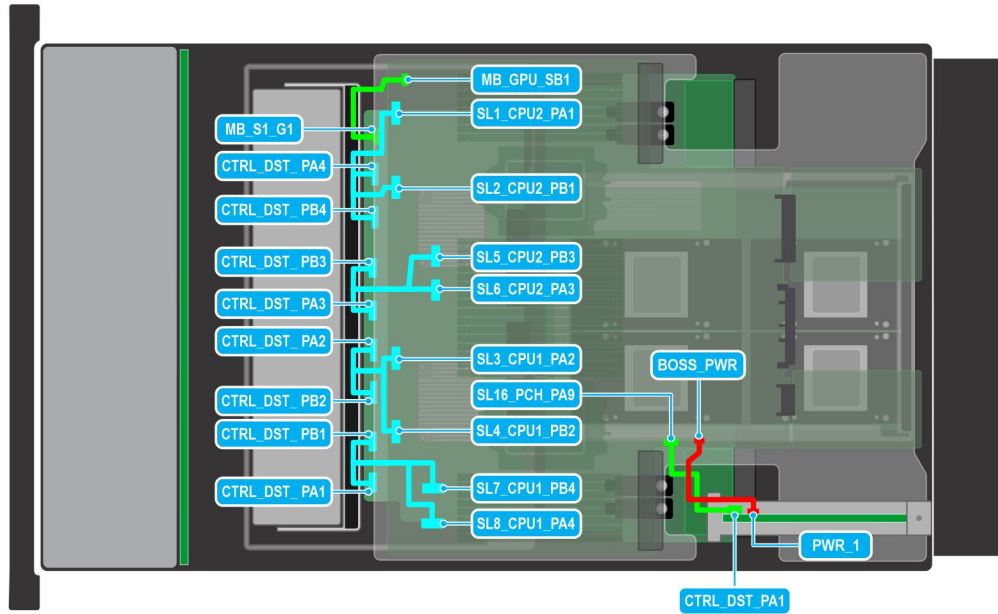
Figure 130. Cable routing for 8 x 2.5-inch NVMe SSD backplane with Risers, VSB, PSUs, LAAC assembly

5. Lift the handles up to unlock the LAAC. Holding both the handles, lift the LAAC out of the system
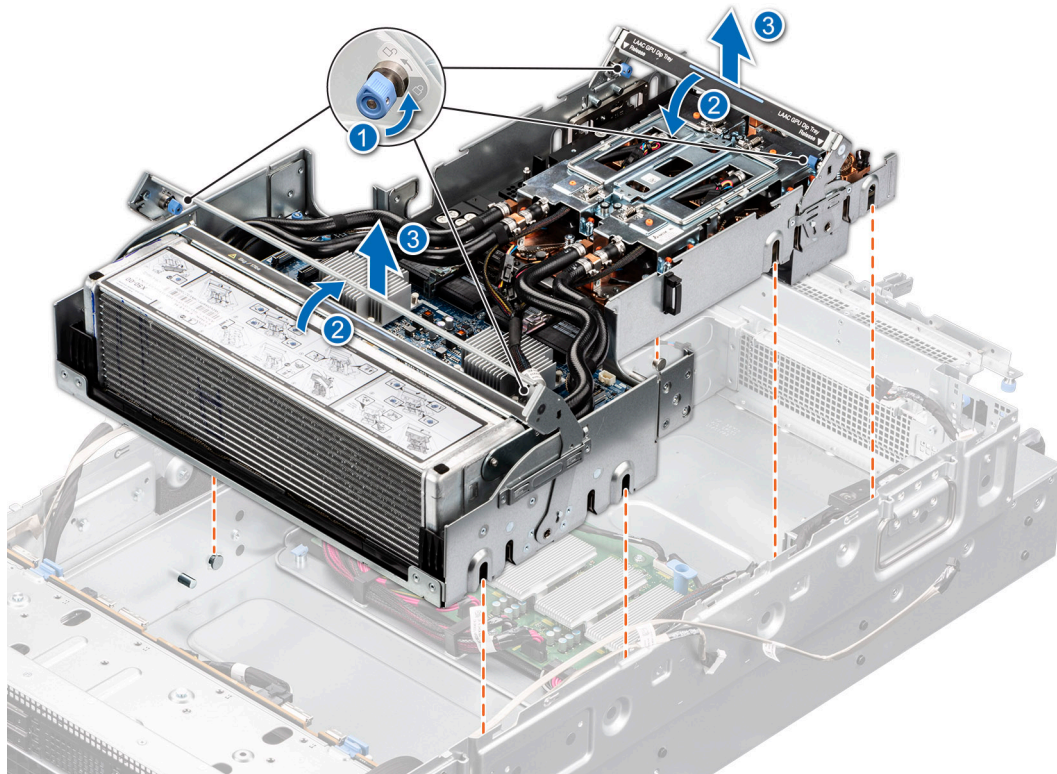
Figure 131. Removing the LAAC assembly

Next steps

Replace the GPU assembly.

Installing the LAAC GPU tray

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 air shroud.
4. Remove the front top cover.
5. Remove the cooling fan and fan cage assembly.
6. Remove the expansion card risers.
7. Remove the memory modules.
8. Remove the heat sink.
9. Remove the processors.
10. Remove the OCP card (if installed).
11. Remove the power supply units (PSU).
12. Remove the VSB
13. Disconnect cables that are connected to the components.
14. Remove the system board
15. Remove the system board tray.

Steps

1. Push down the black latch and reconnect the GPU cable connecting on the NVlink baseboard.
2. Hold the two blue thumb screws and rotate the GPU assembly toward front of the system.
3. Using a Phillips 2 screwdriver, tighten the two blue thumb screws on both side of the GPU assembly.
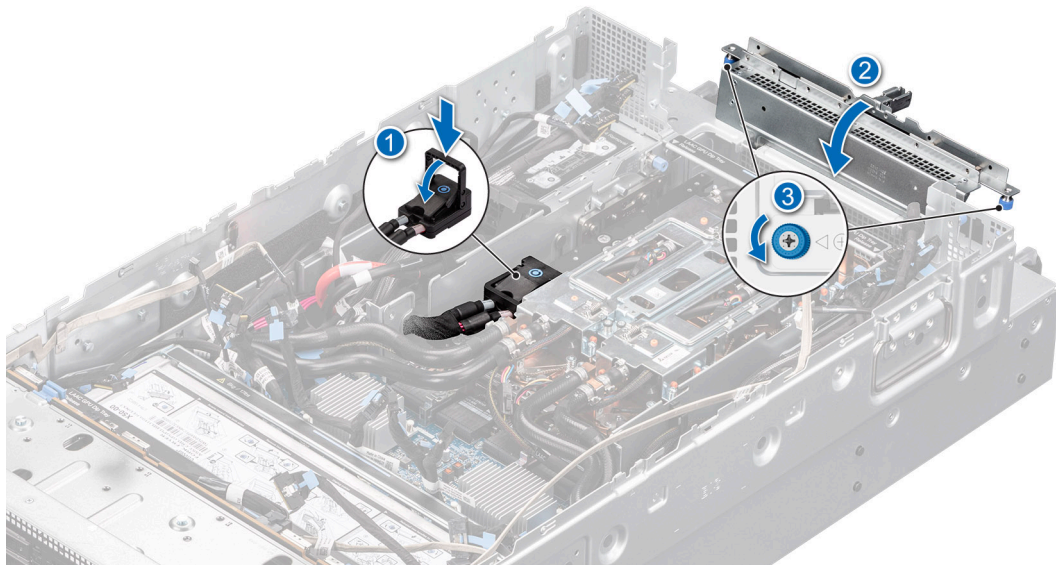
Figure 132. Installing the GPU assembly and cable

4. Reconnect the cables from the LAAC GPU Tray connector on to the PDB.
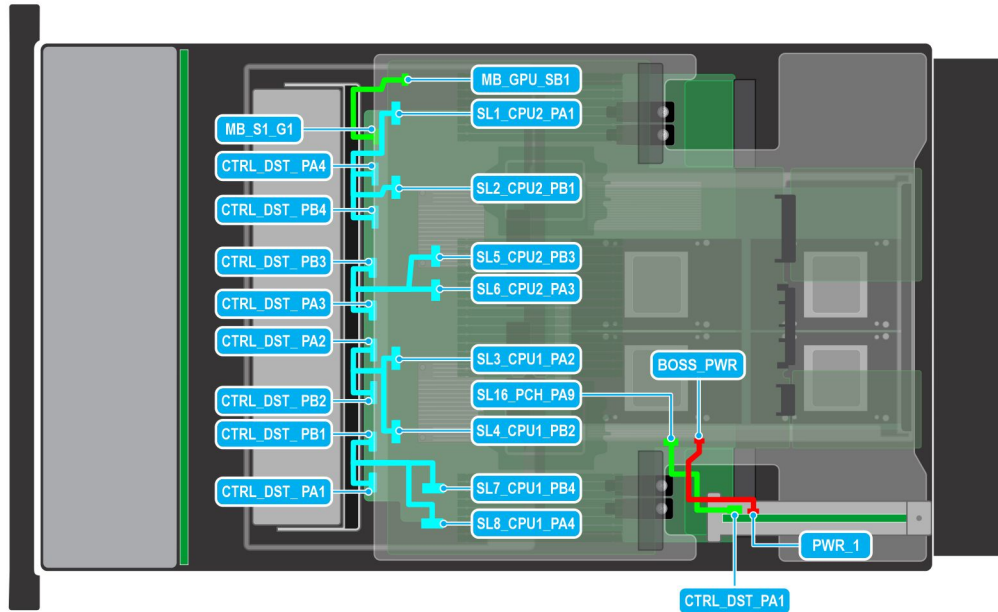
Figure 133. Cable routing for 8 x 2.5-inch NVMe SSD backplane with Risers, VSB, PSUs, LAAC assembly

5. Holding both the handles, align and lower tray along the guiding features with their corresponding marks on the chassis until the tray locks in its place. Push the handles in its locking position.
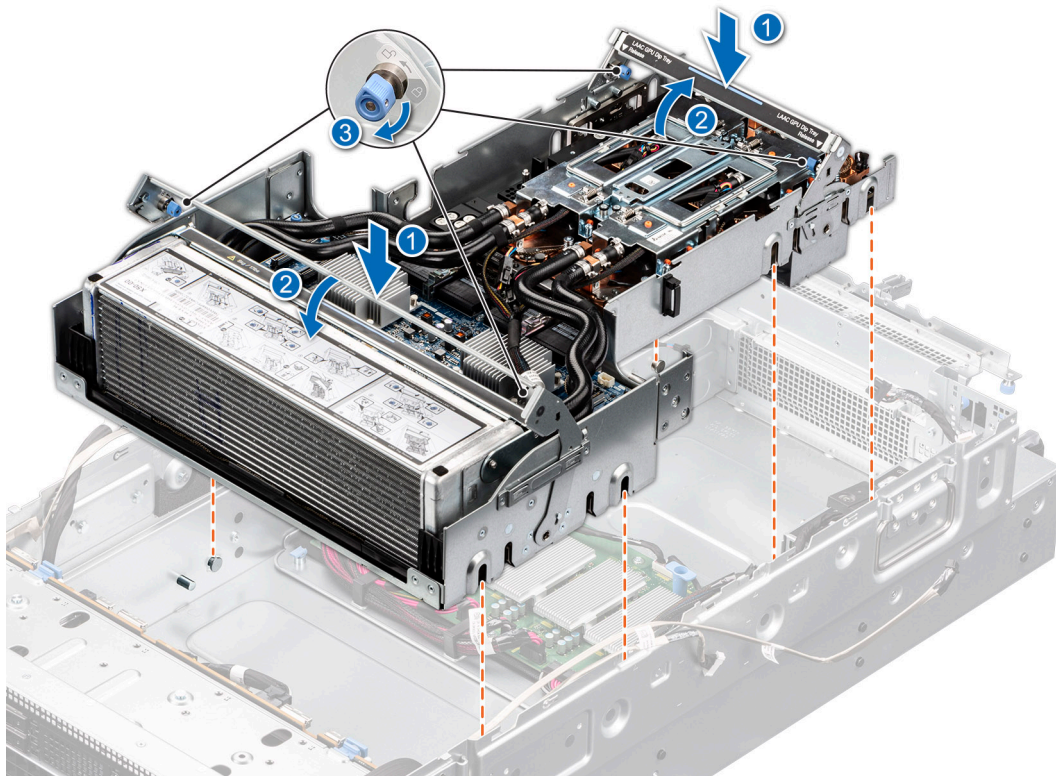
Figure 134. Installing the LAAC GPU tray

Next steps

1. Replace the System board tray.
2. Follow the procedure listed in After working inside your system.

Power distribution board (PDB)

Removing the power distribution 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. Disconnect cables that are connected to the components.
4. Remove the following components:
   a. Air shroud.
   b. Front top cover.
   c. Cooling fan and fan cage assembly.
   d. Expansion card risers.
   e. Memory modules.
   f. Heat sink.
   g. Processor.
   h. OCP card (if installed).
   i. Power supply units (PSU).
   j. Disconnect cables that are connected to the components.
   k. VSB
   l. BOSS-N1 card carrier, M.2 SSD module and BOSS-N1 card
   m. System board
   n. System board tray
   o. LAAC
   p. Disconnect cables that are connected to the components.

Steps

1. Unlock the plungers to release the PDB tray handle from the chassis.
2. Using the PDB holders, lift the PDB out of the chassis.
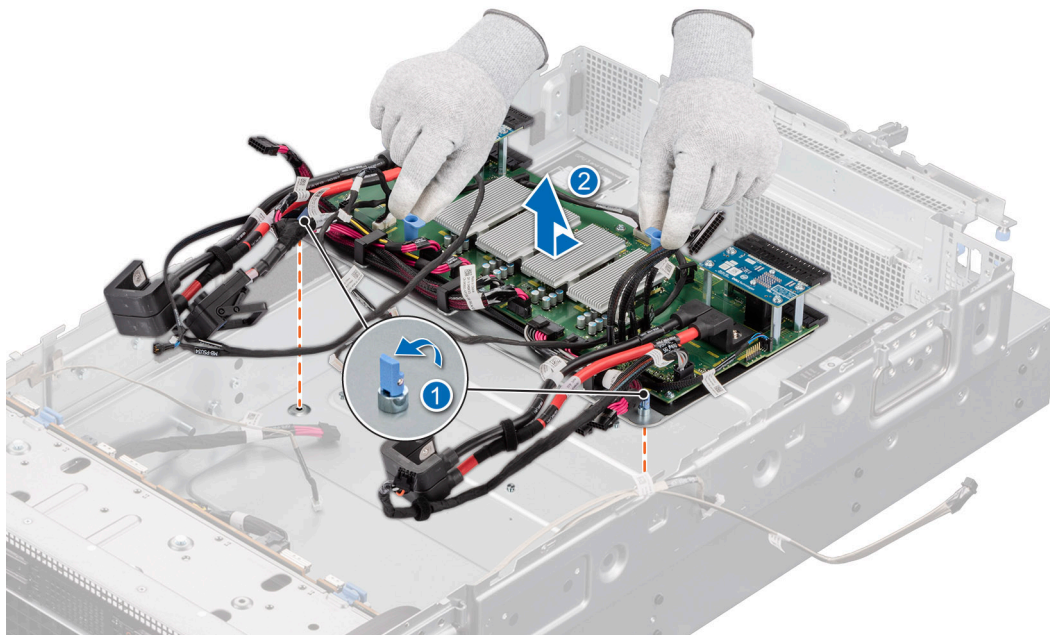
Figure 135. Removing the PDB tray

Next steps

Replace the power distribution board (PDB).

Installing the power distribution 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 all the components that are listed in the removing the power distribution board section.

Steps

1. Using the PDB holders, align the PDB tray to the guiding pins in the chassis. Lower it and slide to the rear of the system.
2. Lock the plungers on the PDB tray to secure it to the chassis.
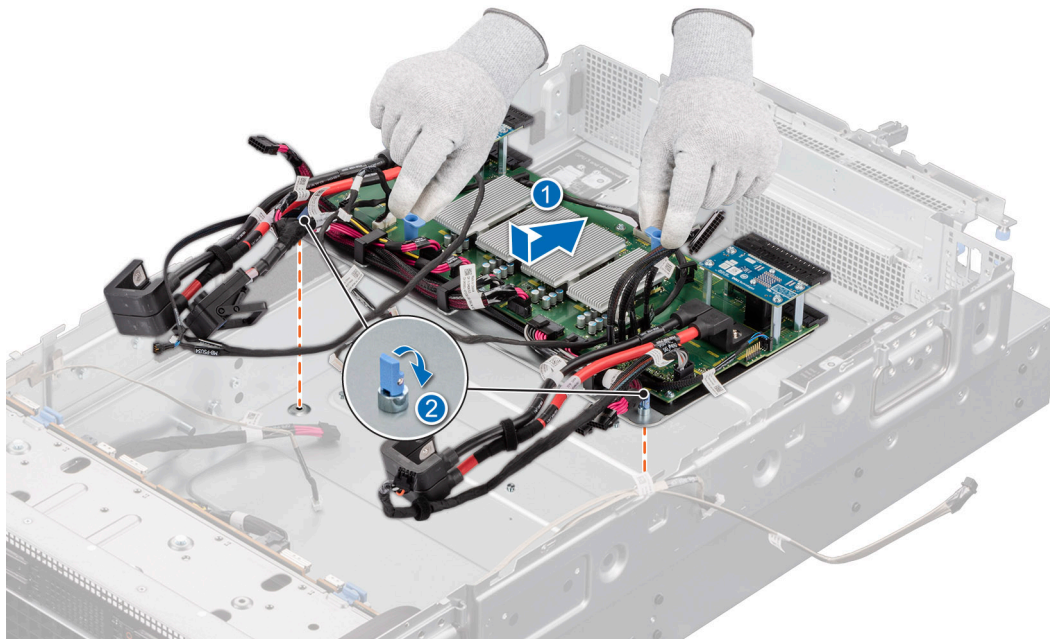
Figure 136. Installing the PDB tray

Next steps

1. Install the following components:
   a. LAAC.
   b. System board tray.
   c. System board.
   d. Power supply units (PSU).
   e. OCP card (if installed).
   f. Processor.
   g. Heat sink.
   h. Memory modules.
   i. Cooling fan cage assembly and cooling fan.
   j. Air shroud.
   k. Front top cover.
2. Connect any cables which were previously disconnected from the components.
3. Follow the procedure listed in After working inside your system.

Trusted Platform Module

This is a service technician replaceable part only.

Upgrading the Trusted Platform Module

Removing the TPM

Prerequisites

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

   (i) **NOTE:**
   - Ensure the operating system is compatible with the TPM version you are installing.
   - Ensure that you download and install the latest BIOS firmware on your system.
   - Ensure that the BIOS is configured to enable UEFI boot mode.

   ⚠ **CAUTION: The TPM plug-in module is cryptographically bound to that particular system board after it is installed. When the system is powered on, any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, and the removed TPM cannot be installed on another system board. Ensure any keys you have stored on the TPM have been securely transferred.**

Steps

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

Installing the TPM

Prerequisites

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

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.
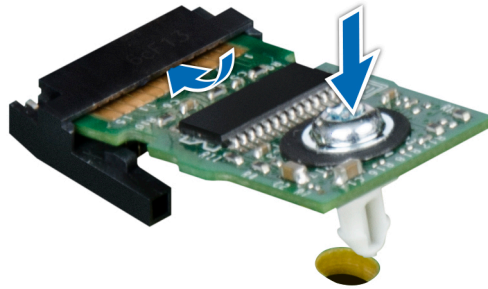
Figure 137. Installing the TPM

Initializing TPM for users

Steps

1. Initialize the TPM.
   For more information, see Initializing the TPM 2.0 for users.
2. The **TPM Status** changes to **Enabled, Activated**.

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.

Jumpers and connectors

This topic provides some basic and specific information about jumpers and switches. It also describes the connectors on the various boards 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 jumpers and connectors
- System board jumper settings
- Disabling a forgotten password

System board jumpers and connectors
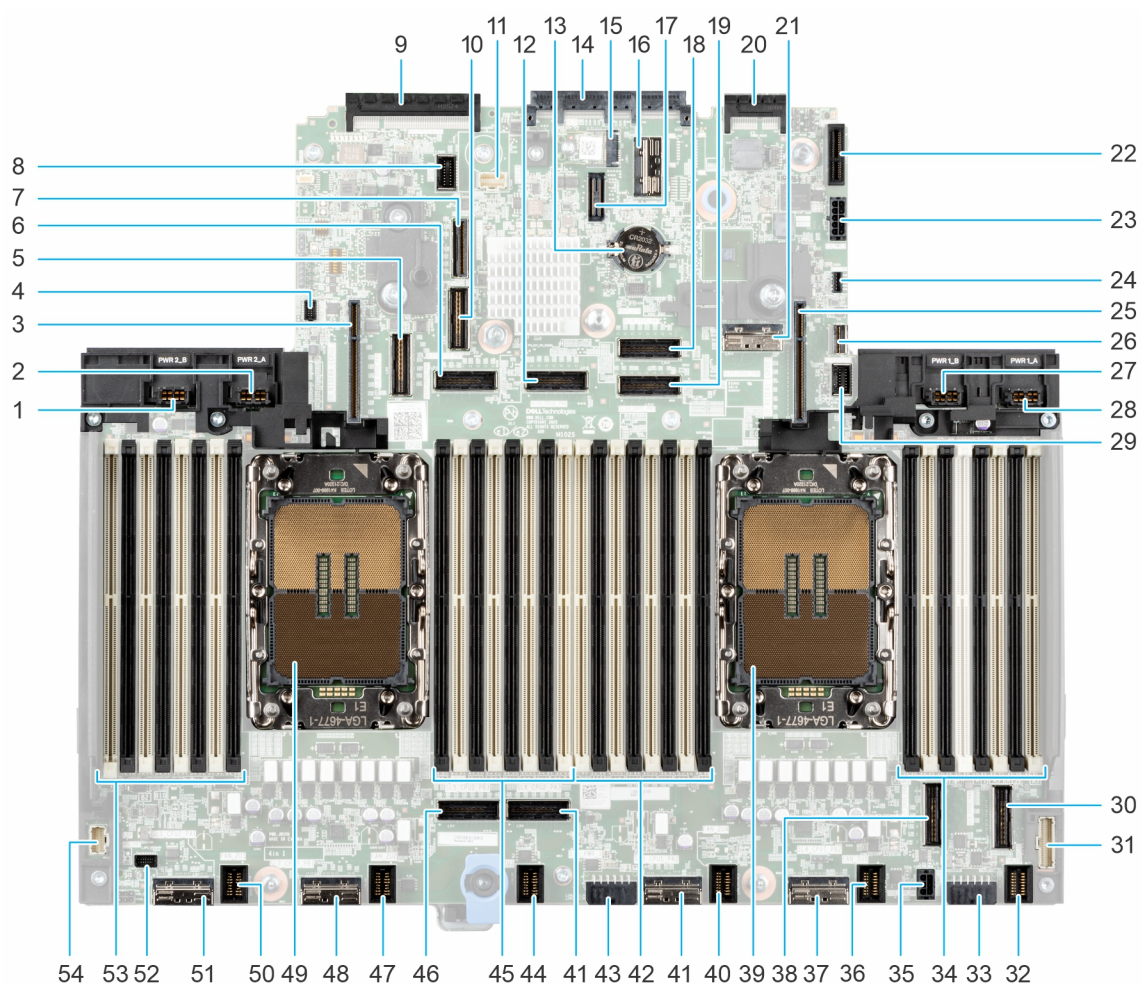
Figure 138. System board jumpers and connectors

1. PWR 2_B
2. PWR 2_A
3. Riser 4 - requires CPU 2
4. PSU 2 PUCK Sideband Signal
5. PCIe Connector 9 (SL9_CPU2_PA5)

6. PCIe Connector 11 (SL11_CPU2_PB6)
7. PCIe Connector 27 (SL27_CPU2_PA10)
8. PSU 5 and PSU 6 Expansion Interface
9. Rear I/O Connecter
10. PCIe Connector 10 (SL10_CPU2_PB5)
11. PSU 3 and PSU 4 Expansion Interface
12. PCIe Connector 12 (SL12_CPU2_PA6)
13. Coin Cell Battery
14. OCP NIC 3.0 Connector
15. TPM Connector
16. PCIe Connector DSL1 (DSL1_CPU1_PA8)
17. Jumper
18. PCIe Connector 14 (SL14_CPU1_PA7)
19. PCIe Connector 13 (SL13_CPU1_PB7)
20. LOM Connector
21. PCIe Connector 15 (SL15_CPU1_PB8)
22. ISDM/ Internal USB Connector
23. PWR Connector 0
24. BOSS Card Power
25. Riser 1
26. PCIe Connector 16 (SL16_PCH_PA9)
27. PWR1_B
28. PWR1_A
29. Front VGA Connector
30. PCIe Connector 18 (SL8_CPU1_PA4)
31. Right Control Panel Connector
32. Fan 6
33. PCIe Connector 6 (SL6_CPU2_PA3)
34. DIMM for CPU 1
35. PWR Connector OB
36. Fan 5
37. PCIe Connector 4 (SL4_CPU1_PB2)
38. PCIe Connector 7 (SL7_CPU1_PB4)
39. CPU 1
40. Fan 4
41. PCIe Connector 3 (SL3_CPU1_PB2)
42. DIMM for CPU 1
43. PWR Connector 1
44. Fan 3
45. DIMMs for CPU 2
46. PCIe Connector 5 (SL5_CPU2_PB3)
47. Fan 2
48. PCIe Connector 2 (SL2_CPU2_PB1)
49. CPU 2
50. Fan 1
51. PCIe Connector 1 (SL1_CPU2_PA1)
52. GPU Sideband Signal
53. DIMMs for CPU 2
54. Left Control Panel Connector

System board jumper settings

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

Table 62. System board jumper settings

Jumper	Setting	Description
PWRD_EN	`[■■] •` 2 4 6 (default)	The BIOS password feature is enabled.
	`• [■■]` 2 4 6	The BIOS password feature is disabled. The BIOS password is now disabled and you are not allowed to set a new password.
NVRAM_CLR	`• [■■]` 1 3 5 (default)	The BIOS configuration settings are retained at system boot.
	`[■■] •` 1 3 5	The BIOS configuration settings are cleared at system boot.

⚠ **CAUTION: You should be cautious when changing the BIOS settings. The BIOS interface is designed for advanced users. Any changes in the setting might prevent your system from starting correctly and may even result in data loss.**

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 attached peripherals. Disconnect the system from the electrical outlet, and disconnect the peripherals.
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 peripherals and connect the system to the electrical outlet, and then power on the system.
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 peripherals and connect the system to the electrical outlet, and then power on the system.
11. Assign a new system and/or setup password.

System diagnostics and indicator codes

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

Topics:

Status LED indicators

(i) **NOTE:** The indicators display solid amber if any error occurs.
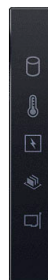
Figure 139. Status LED indicators

Table 63. Status LED indicators and descriptions

Icon	Description	Condition	Corrective action
	Drive indicator	The indicator turns solid amber if there is a drive error.	• Check the System Event Log to determine if the drive has an error. • Run the appropriate Online Diagnostics test. Restart the system and run embedded diagnostics (ePSA). • If the drives are configured in a RAID array, restart the system, and enter the host adapter configuration utility program.
	Temperature indicator	The indicator turns solid amber if the system experiences a thermal error (for example, the ambient temperature is out of range or there is a fan failure).	Ensure that none of the following conditions exist: • A cooling fan has been removed or has failed. • System cover, air shrouds, or back filler bracket has been removed. • Ambient temperature is too high. • External airflow is obstructed. If the problem persists, see the Getting help section.
	Electrical indicator	The indicator turns solid amber if the system experiences an	Check the System Event Log or system messages for the specific issue. If it is due to a problem with

Table 63. Status LED indicators and descriptions (continued)

Icon	Description	Condition	Corrective action
		electrical error (for example, voltage out of range, or a failed power supply unit (PSU) or voltage regulator).	the PSU, check the LED on the PSU. Reseat the PSU. If the problem persists, see the Getting help section.
	Memory indicator	The indicator turns solid amber if a memory error occurs.	Check the System Event Log or system messages for the location of the failed memory. Reseat the memory module. If the problem persists, see the Getting help section.
	PCIe indicator	The indicator turns solid amber if a PCIe card experiences an error.	Restart the system. Update any required drivers for the PCIe card. Reinstall the card. If the problem persists, see the Getting help section. ⓘ **NOTE:** For more information about the supported PCIe cards, see the Expansion cards and expansion card risers > Expansion card installation guidelines section.

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 140. System health and system ID indicator

Table 64. 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:

Table 65. 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.
LED Indicator off	Indicates that the laptop or tablet is unplugged.

LCD panel

The LCD panel provides system information, status, and error messages to indicate if the system is functioning correctly or requires attention. The LCD panel is used to configure or view the iDRAC IP address of the system. 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**..

The LCD panel is available only on the optional front bezel. The optional front bezel is hot pluggable.

The status and conditions of the LCD panel are outlined here:

● The LCD backlight is white during normal operating conditions.
● If there is an issue, the LCD backlight turns amber and displays an error code followed by descriptive text.

    (i) **NOTE:** If the system is connected to a power source and an error is detected, the LCD turns amber regardless of whether the system is powered on or off.

● When the system powers off and there are no errors, the LCD enters the standby mode after five minutes of inactivity. Press any button on the LCD to power it on.
● If the LCD panel stops responding, remove the bezel and reinstall it.

    If the problem persists, see Getting help.

● The LCD backlight remains off if LCD messaging is powered off using the iDRAC utility, the LCD panel, or other tools.
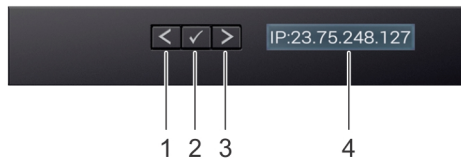
Figure 141. LCD panel features

Table 66. LCD panel features

Item	Button or display	Description
1	Left	Moves the cursor back in one-step increments.
2	Select	Selects the menu item highlighted by the cursor.
3	Right	Moves the cursor forward in one-step increments. During message scrolling: - Press and hold the right button to increase scrolling speed. - Release the button to stop. (i) **NOTE:** The display stops scrolling when the button is released. After 45 seconds of inactivity, the display starts scrolling.
4	LCD display	Displays the system information, status, and error messages or iDRAC IP address.

Viewing Home screen

The **Home** screen displays user-configurable information about the system. This screen is displayed during normal system operation when there are no status messages or errors. When the system turns off and there are no errors, LCD enters the standby mode after five minutes of inactivity. Press any button on the LCD to turn it on.

Steps

1. To view the **Home** screen, press one of the three navigation buttons (Select, Left, or Right).
2. To navigate to the **Home** screen from another menu, complete the following steps:

   a. Press and hold the navigation button till the up arrow ⬆ is displayed.
   b. Navigate to the **Home** icon ⬆ using the up arrow ⬆ .
   c. Select the **Home** icon.
   d. On the **Home** screen, press the **Select** button to enter the main menu.

Setup menu

(i) **NOTE:** When you select an option in the Setup menu, you must confirm the option before proceeding to the next action.

Table 67. Setup menu

Option	Description
iDRAC	Select **DHCP** or **Static IP** to configure the network mode. If **Static IP** is selected, the available fields are **IP**, **Subnet (Sub)**, and **Gateway (Gtw)**. Select **Setup DNS** to enable DNS and to view domain addresses. Two separate DNS entries are available.
Set error	Select **SEL** to view LCD error messages in a format that matches the IPMI description in the SEL. This enables you to match an LCD message with an SEL entry. Select **Simple** to view LCD error messages in a simplified user-friendly description. 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**..

Table 67. Setup menu (continued)

Option	Description
Set home	Select the default information to be displayed on the **Home** screen. See View Home menu section for the options and option items that can be set as the default on the **Home** screen.

View menu

ⓘ **NOTE:** When you select an option in the View menu, you must confirm the option before proceeding to the next action.

Table 68. View menu

Option	Description
iDRAC IP	Displays the **IPv4** or **IPv6** addresses for iDRAC9. Addresses include **DNS** (**Primary** and **Secondary**), **Gateway**, **IP**, and **Subnet** (IPv6 does not have Subnet).
MAC	Displays the MAC addresses for **iDRAC**, **iSCSI**, or **Network** devices.
Name	Displays the name of the **Host**, **Model**, or **User String** for the system.
Number	Displays the **Asset tag** or the **Service tag** for the system.
Power	Displays the power output of the system in BTU/hr or Watts. The display format can be configured in the **Set home** submenu of the **Setup** menu.
Temperature	Displays the temperature of the system in Celsius or Fahrenheit. The display format can be configured in the **Set home** submenu of the **Setup** menu.

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.
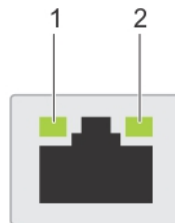
Figure 142. NIC indicator codes

1. Link LED indicator
2. Activity LED indicator

Table 69. NIC indicator codes

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

Table 69. NIC indicator codes (continued)

NIC indicator codes	Condition
Link indicator is blinking green, and activity is off.	Indicates that the NIC identity is enabled through the NIC configuration utility.

Power supply unit indicator codes

AC and DC 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.
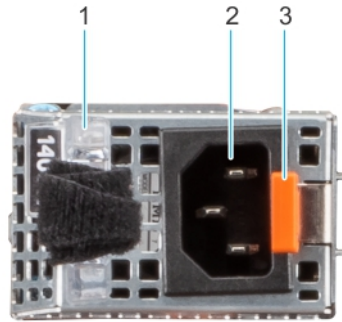
Figure 143. AC PSU status indicator

1. AC PSU handle
2. Socket
3. Release latch

Table 70. AC PSU status indicator codes

Power indicator codes	Condition
Solid 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 will 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**

Table 70. AC PSU status indicator codes (continued)

Power indicator codes	Condition
	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 71. 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 indicate 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 144. Drive indicators

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

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

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

Table 72. Drive indicator codes

Drive status indicator code	Condition
Blinks green twice per second	Indicates that the drive is being identified or preparing for removal.
Not powered on	Indicates that the drive is ready for removal. (i) **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 unexpected 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.

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

(i) **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 Boot Manager

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

Steps

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

Running the Embedded System Diagnostics from the Dell Lifecycle Controller

Steps

1. When the system is booting, 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 start executing the tests on all the detected devices.

System diagnostic controls

Table 73. 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.

System board diagnostic LED indicators

The system board LED indicators provide status of the system when it is powered on, which help identify POST and hardware issues.

The following tables show the behavior system board diagnostic LED indicators during power sequencing and power faults.

Table 74. System board diagnostic LED indicators during power sequencing

DS7	DS6	DS5	DS4	DS3	DS2	DS1	Description
●	●	●	●	●	●	●	System Off
●	●	●	●	●	●	◉	Power on Reset
●	●	●	●	●	◉	●	5V_AUX Enabled, waiting for 5V_AUX / V_VSB11_AUX Power Good
●	●	●	●	●	◉	◉	VRD_1P05_PVNN_SW_EN enabled, waiting for VRD_1P05_PVNN_SW_PG Power Good &PCH_SLP_SUS_N
●	●	●	●	◉	●	●	PCH_RSMRST_R_N Enabled, waiting cBmcPostReady ready. Waiting for PS*_PG ready.
●	●	●	◉	●	●	●	[S5_IDLE] Waiting for cSysPowerOn = '1' & cBMCHoldInS5 = '0' & cGpu_Fpga_Ready = '1'. CPLD_MEM_VIN_MGMT_EN_R = cDimmCheck Good.

Table 74. System board diagnostic LED indicators during power sequencing (continued)

DS7	DS6	DS5	DS4	DS3	DS2	DS1	Description
Dark green	Dark green	Dark green	Light green	Dark green	Dark green	Light green	Vrd_12V_DIMM_EN / P12V_EN / CPLD_MEM_VIN_MGMT_EN Enabled, waiting BP_SIG_PWR*_PG.
Dark green	Dark green	Dark green	Light green	Dark green	Light green	Dark green	VRD_3P3_EN Enabled, waiting for VRD_3P3_MAIN_PG Power Good
Dark green	Dark green	Dark green	Light green	Dark green	Light green	Light green	VRD_CPU*_VCCD Enabled, waiting for VRD_CPU*_VCCD_PG = '1'
Dark green	Dark green	Dark green	Light green	Light green	Dark green	Dark green	VRD_CPU*_VCCFA Rail(s) Enabled, waiting for VRD_CPU*_VCCFA Rail(s) Power Good
Dark green	Dark green	Dark green	Light green	Light green	Dark green	Light green	VRD_CPU*_FIVRA Rail(s) Enabled, waiting for VRD_CPU*_FIVRA Rail(s) Power Good
Dark green	Dark green	Dark green	Light green	Light green	Light green	Dark green	VRD_CPU*_INFAON Rail(s) Enabled, waiting for VRD_CPU*_INFAON Rail(s) Power Good
Dark green	Dark green	Dark green	Light green	Light green	Light green	Light green	VRD_CPU*_PVNN Rail(s) Enabled, waiting for VRD_CPU*_PVNN Rail(s) Power Good

DS7	DS6	DS5	DS4	DS3	DS2	DS1	Description
Off	Off	On	Off	Off	Off	Off	VRD_CPU*_VCCIN Rail(s) Enabled, cDramPwrOk Enable, waiting for VRD_CPU*_VCCIN Rail(s)Power Good and hold after Power Good for 100ms
Off	Off	On	Off	Off	Off	On	PCH_PWRGOOD Enabled, CLK_BUFFER_EN Enabled, SYSTEM_PWRGOOD Enable, waiting forPCH_CPLD_PROCPWRGD and wait 5ms
Off	Off	On	Off	Off	On	Off	VRD_CPU*_VPP Rail(s) Enabled, waiting for VRD_CPU*_VPP Rail(s) Power Good
On	On	On	On	On	On	On	[S0_RUN]
Off	On	Off	Off	Off	Off	Off	[PD_INIT]
Off	On	Off	Off	Off	Off	On	[PD_IDLE]
Off	On	Off	Off	Off	On	Off	[DPU_PD_STATE1]
Off	On	Off	Off	Off	On	On	[SPD_STATE1]
Off	On	Off	Off	On	Off	Off	[SPD_STATE2]

Table 74. System board diagnostic LED indicators during power sequencing (continued)

DS7	DS6	DS5	DS4	DS3	DS2	DS1	Description
dark green	light green	dark green	dark green	light green	dark green	light green	[SPD_STATE 7]
dark green	light green	dark green	dark green	light green	light green	dark green	[SPD_IDLE]
dark green	light green	light green	dark green	dark green	light green	light green	[KULL_MAIN]
dark green	light green	light green	dark green	light green	dark green	dark green	[KULL_AUX]
B	dark green	dark green	light green	dark green	dark green	light green	[RUN_CPS_ARMED]

Table 75. System board diagnostic LED indicators during power faults

DS7	DS6	DS5	DS4	DS3	DS2	DS1	Description
B	B	B	dark green	dark green	dark green	dark green	VrdCpu1VccdFault
dark green	dark green	dark green	B	dark green	B	B	VrdCpu1VccinFault
B	B	B	dark green	dark green	dark green	B	VrdCpu1VppFault
B	B	B	dark green	dark green	B	dark green	VrdCpu1VccfaFault
B	B	B	dark green	dark green	B	B	VrdCpu1FivraFault
B	B	B	dark green	B	dark green	dark green	VrdCpu1InfaonFault
B	B	B	dark green	B	dark green	B	VrdCpu1PvnnFault
B	B	B	B	dark green	B	dark green	VrdCpu2VccdFault

DS7	DS6	DS5	DS4	DS3	DS2	DS1	Description
B	B	B	B	●	B	B	VrdCpu2VppFault
B	B	B	B	B	●	●	VrdCpu2VccfaFault
●	●	B	B	●	B	●	VrdCpu2VccinFault
B	B	B	B	B	●	B	VrdCpu2FivraFault
B	B	B	B	B	B	●	VrdCpu2InfaonFault
B	B	B	B	B	B	B	VrdCpu2PvnnFault
●	B	●	B	●	B	●	Pdb_PwrFault
●	B	B	B	B	●	B	BpSigPwrFault0
●	B	B	B	B	B	●	BpSigPwrFault1
●	B	B	B	B	B	B	BpSigPwrFault2
B	●	B	●	●	●	B	Vrd1v05PvnnSwFault
B	●	B	●	B	B	●	VrdP3v3Fault
B	●	B	B	●	B	B	VrdP5vSwFault
B	●	B	B	B	●	●	VrdVsb11SwFault

DS7	DS6	DS5	DS4	DS3	DS2	DS1	Description
B	●	B	B	B	●	B	OcpFault
B	B	●	B	B	●	●	CPU1_M_CHAB_Fault
B	B	●	B	B	●	B	CPU1_M_CHCD_Fault
B	B	●	B	B	B	●	CPU1_M_CHEF_Fault
B	B	●	B	B	B	B	CPU1_M_CHGH_Fault
B	B	B	●	B	B	●	CPU2_M_CHAB_Fault
B	B	B	●	B	B	B	CPU2_M_CHCD_Fault
B	B	B	B	●	●	●	CPU2_M_CHEF_Fault
B	B	B	B	●	●	B	CPU2_M_CHGH_Fault
●	B	●	B	●	●	B	GPU_Pwr_Fault
●	B	●	●	●	●	●	PUCK_fault
●	●	B	B	●	B	B	BOSS_pg_fault

Enhanced Preboot System Assessment

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 requiring more 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

(i) **NOTE:** The Dell Embedded System Diagnostics is also known as Enhanced Preboot System Assessment (ePSA) diagnostics.

The embedded system diagnostics provides a set of options for particular device groups or devices that allow you to:

- Run tests automatically or in an interactive mode.
- Repeat tests
- Display or save test results.
- Introduce more test options for extra information about the failed devices, run a thorough test.
- 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 Boot Manager

To run the embedded system diagnostics from Boot Manager:

```
F2  = System Setup
F10 = Lifecycle Controller
F11 = Boot Manager
F12 = PXE Boot
```

1. As the system boots, press **F11**.
2. Using the arrow keys select **System Utilities** → **Launch Diagnostics**.
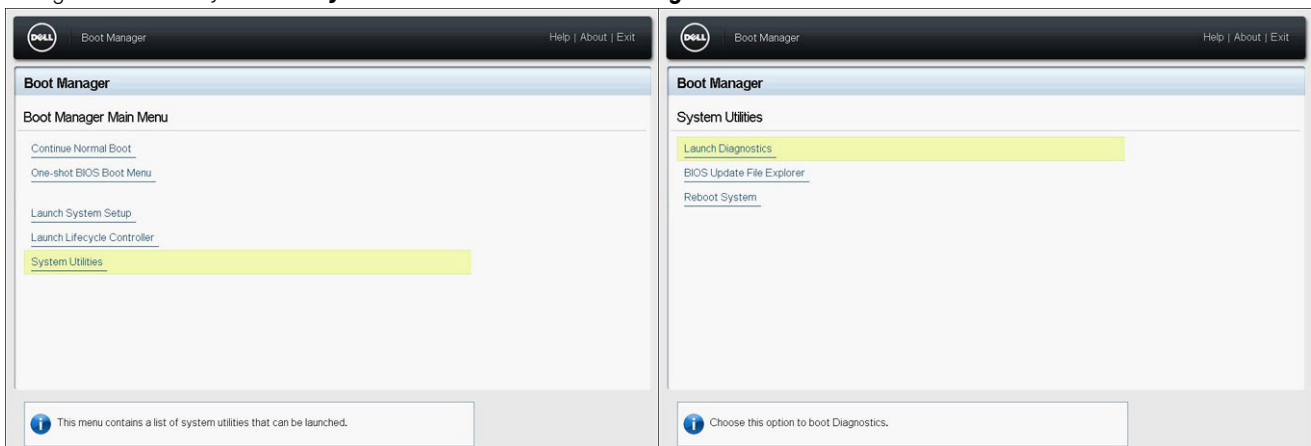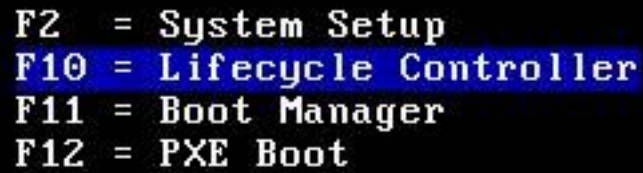
3. Wait while the Quick Tests automatically run.
4. Once the tests have been completed, you can view the results and additional information on the **Results** tab, the **System Health** tab, the **Configuration** tab, and the **Event Log** tab.
5. Close the **Embedded System Diagnostics** utility.

6. To leave the diagnostics, click **Exit.**
7. Click **OK** when prompted, and the system reboots.

Running the Embedded System Diagnostics from the Dell Lifecycle Controller

To run the embedded system diagnostics from the Dell Lifecycle Controller:

1. As the system boots, press **F10**.

2. Select **Hardware Diagnostics → Run Hardware Diagnostics**.

Getting help

Topics:

- Recycling or End-of-Life service information
- Contacting Dell Technologies
- Accessing system information by using QRL
- Receiving automated support with Secure Connect Gateway (SCG)

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 Technologies

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 follow these steps:

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:
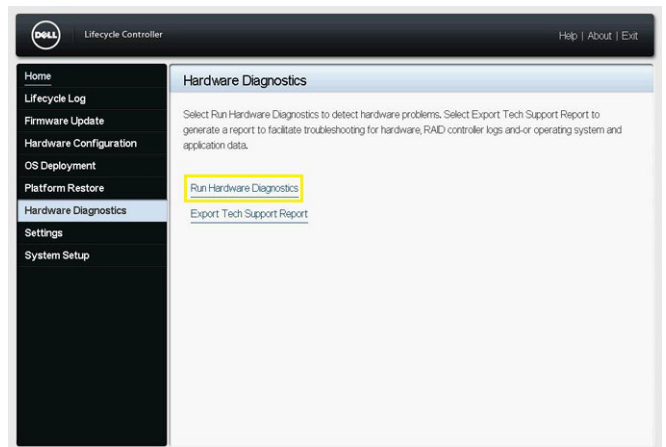   a. Enter the system Service Tag in the **Enter a Service Tag, Serial Number, Service Request, Model, or Keyword** field.
   b. Click **Search**.
      The support page that lists the various support categories is displayed.
4. For general support:
   a. Select your product category.
   b. Select your product segment.
   c. Select your product.
      The support page that lists the various support categories is displayed.
5. For contact details of Dell Global Technical Support:
   a. Click Contact Technical Support.
   b. The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the information tag in the front of the XE8640 system, to access information about PowerEdge XE8640. There is also another QRL for accessing product information located on the back of the system cover.

Prerequisites

Ensure that your smartphone or tablet has a 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 XE8640 system

Figure 145. Quick Resource Locator for PowerEdge XE8640 system

Receiving automated support with Secure Connect Gateway (SCG)

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

- Automated issue detection — Secure Connect Gateway (SCG) monitors your Dell devices and automatically detects hardware issues, both proactively and predictively.
- Automated case creation — When an issue is detected, Secure Connect Gateway (SCG) automatically opens a support case with Dell Technical Support.

- Automated diagnostic collection — Secure Connect Gateway (SCG) automatically collects system state information from your devices and uploads it securely to Dell. This information is used by Dell Technical Support to troubleshoot the issue.
- Proactive contact — A Dell Technical Support agent contacts you about the support case and helps you resolve the issue.

The available benefits vary depending on the Dell Service entitlement purchased for your device. For more information about Secure Connect Gateway (SCG), go to www.dell.com/secureconnectgateway.

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 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 model number, see the front of your system.

  3. On the Product Support page, click **Documentation**.
- Using search engines:
  ○ Type the name and version of the document in the search box.

Table 76. 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/poweredgemanuals
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/poweredgemanuals
	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

Table 76. Additional documentation resources for your system (continued)

Task	Document	Location
	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/poweredgemanuals
	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 Secure Connect Gateway, see the Dell Secure Connect Gateway Enterprise User's Guide.	https://www.dell.com/serviceabilitytools
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	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
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	www.dell.com/poweredgemanuals