Dell PowerEdge XR5610

Installation and Service Manual

DELLTechnologies

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.

PowerEdge XR5610 system configurations and features

The PowerEdge XR5610 system is a 1U server that supports:

- Rear Accessed configuration or Front Accessed configuration
- One Intel Xeon Scalable and Edge-Enhanced processor with up to 32 cores
- 8 DDR5 DIMM slots
- Two redundant AC or DC power supply units
- Up to 4 x 2.5-inch SAS, SATA, or NVMe SSD drives

ⓘ **NOTE:** The Rear Accessed and Front Accessed configurations cannot be modified into the other configuration.

ⓘ **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**.

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

ⓘ **NOTE:** Only use certified Optical Fiber Transceiver Class | Laser Products.

⚠ **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.**

ⓘ **NOTE:** It is recommended to use a maximum of two add-in cards with SPR EE-LCC CPU. Three add-in cards are supported, but this may result in an overall system performance degradation.

Topics:

- System configurations - front view for PowerEdge XR5610
- System configurations - rear view for PowerEdge XR5610
- Bezel view
- Status LED control panel
- Power button control panel
- System configurations - inside view for PowerEdge XR5610
- Locating the Express Service Code and Service Tag
- System information labels
- Rail sizing and rack compatibility matrix

System configurations - front view for PowerEdge XR5610

Figure 1. Front view of the Front Accessed configuration with front bezel
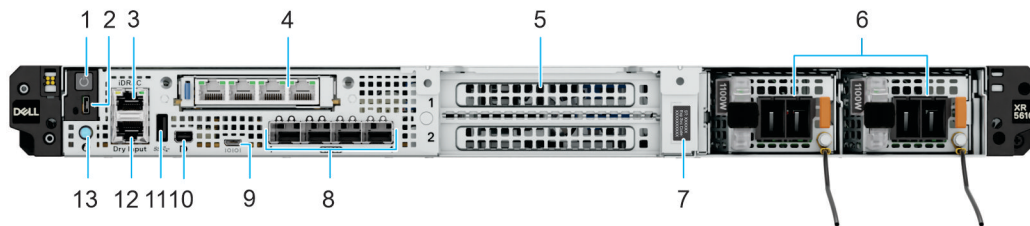
Figure 2. Front view of the Front Accessed configuration without front bezel

Table 1. Features available on the front view of Front Accessed configuration

Item	Ports, panels, or slots	Icon	Description
1	Power button	⏻	Indicates if the system is powered on or off. Press the power button to manually power on or off the system.
2	iDRAC Direct (Micro USB)	🔧	The iDRAC Direct (Micro-AB USB) port enables you to access the iDRAC direct Micro-AB USB features. For more information, see the *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals.
3	iDRAC dedicated port	iDRAC	It is a RJ-45 port.

Item	Ports, panels, or slots	Icon	Description
			Use the iDRAC8 Enterprise port to remotely access iDRAC. For more information, see the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/ idracmanuals**.
4	Optional OCP 3.0	N/A	The OCP NIC card supports OCP 3.0. The NIC ports are integrated on the OCP card which is connected to the OCP riser.
5	PCIe expansion card riser 3 (slot 1 and 2)	N/A	Enables you to connect PCIe expansion card installed on riser 3
6	Power supply unit (PSU1 and PSU2)	⚡1	Indicates the PSU1 or primary PSU.
7	Mini Express Service Tag (MEST)	N/A	The Mini Express Service Tag (MEST) is a sticker on the metal plate that contains the system service tag.
8	4 x 25 GbE LOM ports	N/A	Provides network connectivity and can also be shared with iDRAC when iDRAC network settings is set to shared mode.
9	Serial port	IOIOI	Enables you to connect a serial device to the system. ⓘ **NOTE:** The serial port is a micro USB type port. It only supports serial connection functions. The serial port does not support any USB functions.
10	Mini-DisplayPort	Ɖ	Enables you to connect a display device to the system.
11	USB 3.0 port	ss⇐	This port is USB 3.0-compliant.
12	RJ45 Dry Input	N/A	It is a RJ-45 Dry Input port. Enhance penetration in IoT space. These are interruptible inputs to iDRAC. Dry means no energy is supplied to the contacts.
13	System identification button	ⓘ	Press the system ID button: ● To locate a particular system within a rack. ● To turn the system ID on or off. To reset iDRAC, press and hold the button for more than 16 seconds.

Table 1. Features available on the front view of Front Accessed configuration (continued)

Item	Ports, panels, or slots	Icon	Description
			ⓘ **NOTE:** ● To reset iDRAC using system ID, ensure that the system ID button is enabled in the iDRAC setup. ● If the system stops responding during POST, press and hold the system ID button (for more than 5 seconds) to enter the BIOS progress mode.

Figure 3. Front view of the Rear Accessed configuration with front bezel

Figure 4. Front view of the Rear Accessed configuration without front bezel

Table 2. Features available on the front view of Rear Accessed configuration

Item	Ports, panels, and slots	Icon	Description
1	Status LED control panel	N/A	Contains the system health, system ID, status LED. ● Status LED: Enables you to identify any failed hardware components. There are up to five

Table 2. Features available on the front view of Rear Accessed configuration (continued)

Item	Ports, panels, and slots	Icon	Description
			status LEDs and an overall system health LED (Chassis health and system ID) bar. For more information, see the Status LED indicators section.
2	Drives	N/A	Enables you to install up to 4 x 2.5-inch SAS/SATA/NVMe SSD drives.
3	Express service tag	N/A	The Express service tag is a slide-out label panel that contains Service Tag, iDRAC MAC address and LOM 1 MAC address.
4	Power button	⏻	Indicates if the system is powered on or off. Press the power button to manually power on or off the system.
5	USB 2.0 port	⚡	This port is USB 2.0-compliant.
6	iDRAC Direct (Micro USB)	🔧	The iDRAC Direct (Micro-AB USB) port enables you to access the iDRAC direct Micro-AB USB features. For more information, see the *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals. .

System configurations - rear view for PowerEdge XR5610

Table 3. Features available on the rear view of Front Accessed configuration

Item	Ports, panels, and slots	Icon	Description
1	Status LED control panel	N/A	Contains the system health, system ID, status LED.

Item	Ports, panels, and slots	Icon	Description
			• Status LED: Enables you to identify any failed hardware components. There are up to five status LEDs and an overall system health LED (Chassis health and system ID) bar. For more information, see the Status LED indicators section.
2	Drives	N/A	Enables you to install up to 4x 2.5-inch SAS/SATA/NVMe SSD drives.
3	Express service tag	N/A	The Express service tag is a slide-out label panel that contains Service Tag, iDRAC MAC address and LOM 1 MAC address.

Figure 6. Rear view of the Rear Accessed configuration

Table 4. Features available on the front view of Front Accessed configuration

Item	Ports, panels, or slots	Icon	Description
1	iDRAC dedicated port	iDRAC	It is a RJ-45 port. Use the iDRAC8 Enterprise port to remotely access iDRAC. For more information, see the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.
2	Optional OCP 3.0	N/A	Provides network connectivity and can also be shared with iDRAC when iDRAC network settings is set to shared mode.
3	PCIe expansion card riser 3 (slot 1 and 2)	N/A	Enables you to connect PCIe expansion card installed on riser 3
4	Power supply unit (PSU1 and PSU2)	⚡1	Indicates the PSU1 or primary PSU.

Item	Ports, panels, or slots	Icon	Description
5	Mini Express Service Tag (MEST)	N/A	The Information tag a sticker that contains Service Tag and Express Service Code
6	4 x 25 GbE LOM ports	N/A	Provides network connectivity and can also be shared with iDRAC when iDRAC network settings is set to shared mode.
7	Serial port	IOIOI	Enables you to connect a serial device to the system. ⓘ **NOTE:** The serial port is a micro USB type port. It only supports serial connection functions. The serial port does not support any USB functions.
8	Mini-DisplayPort	ⅅ	Enables you to connect a display device to the system.
9	USB 3.0 port	ss⟵	This port is USB 3.0-compliant.
10	RJ45 Dry Input	N/A	It is a RJ-45 Dry Input port. Enhance penetration in IoT space. These are interruptible inputs to iDRAC. Dry means no energy is supplied to the contacts.
11	System identification button	ⓘ	Press the system ID button: ● To locate a particular system within a rack. ● To turn the system ID on or off. To reset iDRAC, press and hold the button for more than 16 seconds. ⓘ **NOTE:** ● To reset iDRAC using system ID, ensure that the system ID button is enabled in the iDRAC setup. ● If the system stops responding during POST, press and hold the system ID button (for more than 5 seconds) to enter the BIOS progress mode.

Bezel view

Figure 7. Bezel for the Rear Accessed configuration

Table 5. Bezel for the Rear Accessed configuration

Item	Indicator, button, or connector	Description
1	Bezel filter	Provides protection from sand and dust. ⓘ **NOTE:** To maintain optimal system health, Dell recommends checking and changing the filter every three months. Filters can be ordered from Dell.
2	Bezel key lock	Locking mechanism for the bezel. The bezel comes with a key.
3	Bezel LED indicator	System health indicator.
4	Bezel release button	When pressed, the bezel will unlock from the system.
5	Bezel filter release button	Bezel filter button is pressed to release the bezel filter.
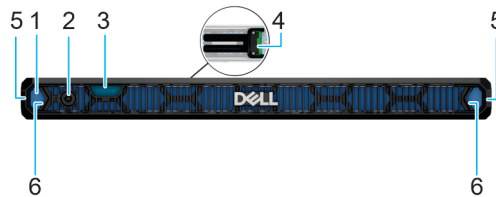
Figure 8. Bezel for the Front Accessed configuration

ⓘ **NOTE:** Without the front bezel, Front Accessed configuration support racks with 80 mm spacing from rack ear of chassis to inside surface of rack door. With the front bezel installed, the Front Accessed configuration system support racks with 100 mm spacing from rack ear of chassis to inside surface of the rack door

Table 6. Bezel for the Front Accessed configuration

Item	Indicator, button, or connector	Description
1	Bezel filter	Provides protection from sand and dust. ⓘ **NOTE:** To maintain optimal system health, Dell recommends checking and changing the filter every three months. Filters can be ordered from Dell.
2	Bezel key lock	Locking mechanism for the bezel. The bezel comes with a key.
3	Bezel LED indicator	System health indicator.
4	Pressure sensor	Indicates when to replace the filter. ⓘ **NOTE:** The pressure sensor device is located behind the bezel.
5	Bezel release button	When pressed, the bezel will unlock from the system.
6	Bezel filter release button	Bezel filter button is pressed to release the bezel filter.

Bezel overview

Bezel filter
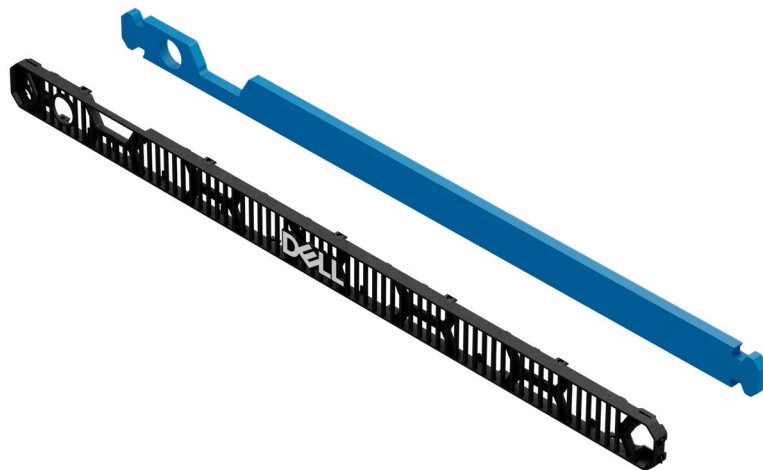
Figure 9. Bezel filter

The PowerEdge XR5610 has a front bezel that comes with a lock feature and a diagnostics LED. The bezel is designed with a filter that provides protection against sand and dust.

Pressure sensor

The pressure sensor device on the front bezel is only available on the Front Accessed configuration systems. The pressure sensor indicates when to replace the bezel filter in iDRAC. The connection between the pressure sensor with the XR5610 system is established through the POGO pin that connects the pressure sensor to the system chassis.

Filter modes

There are two filter modes available in the iDRAC when a bezel installed.

- Count Down mode
- Active Sensing mode
  ⓘ **NOTE:** Only available for the Front Accessed configuration with pressure sensor.

Count Down mode and Active Sensing mode are mutually exclusive, thus the user can activate either the Count Down mode or the Active Sensing mode. Not both simultaneously in a single server. The sensor events can be enabled or disabled by using the "Air filter alert" option. In the Active Sensing mode, the sensor events are triggered when a physical bezel is installed. The "Air filter alert" option is disabled by default. When the option is disabled, iDRAC monitors the presence or absence of the filter. It monitors the status of the filter.

Count Down mode

The Count Down mode works as follows:

- The alerts are sent out based on the filter life expiry date. iDRAC provides the following data for users to manage the filter:
  ⓘ **NOTE:** This mode can be used for passive or active bezel filters. It counts down when the system is switched on.

- ○ **Filter Change Interval** — This attribute is configurable in months and set to 3 months by default. This option allows users to configure the filter change interval from 1 to 24 months.
  - ○ **Filter Life Remaining** — This attribute indicates the filter life span in days. The count down timer is activated when the server is switched on. Once the it counts down to zero, the filter status goes to a degraded state.
  - ○ **Reset Filter Life** — Enable users to reset the filter life. This loads the Filter Life Remaining time with the current Filter Change Interval time. The count down starts when the system is switched on. Enabling this option activates a system log—BEZL0007.
- ● Readings and alerts:
  - ○ BEZL0003 filter dirty—indicates that a filter replacement is required. Occurs when the count down mode has reached the time limit.
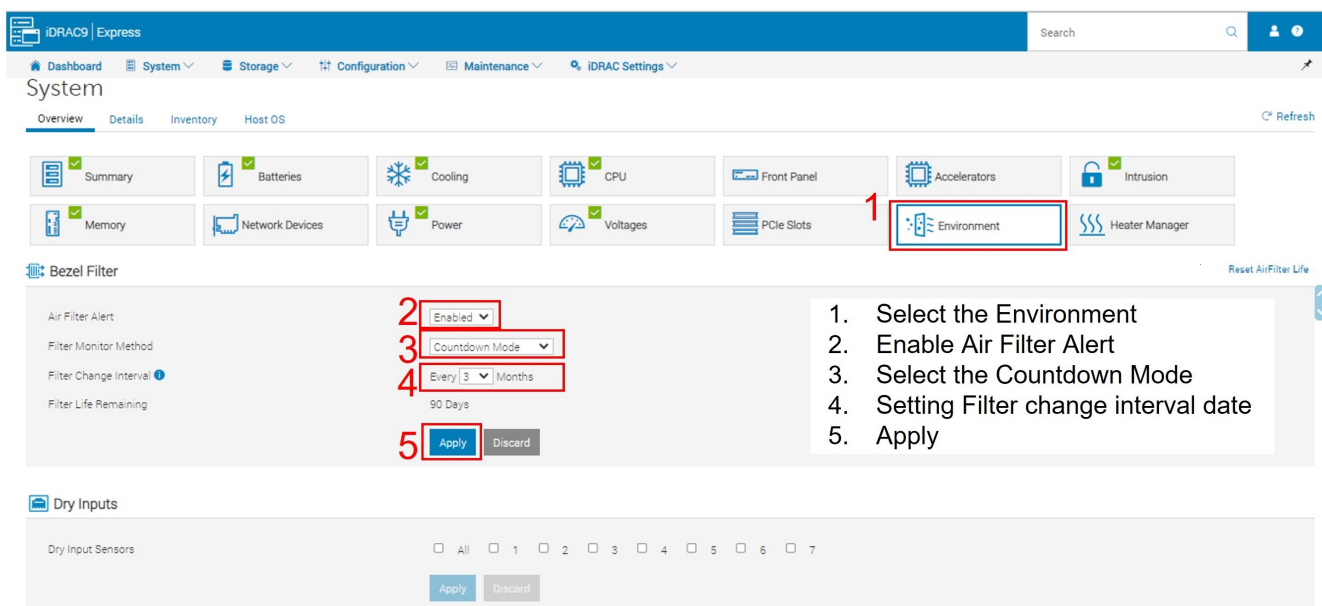
Figure 10. iDRAC interface of the Count Down mode

Active Sensing mode

The Active Sensing mode works as follows:

ⓘ **NOTE:** This mode requires an active bezel filter. An unsupported configuration indicates that the filter baseline is not supported and generates an error log—BEZL0006.

- ● When enabled, the iDRAC monitors the filter pressure sensor to determine the filter status.
- ● **Reset Filter Life** — resets the filter reading and sets it as a baseline reading.

  ⓘ **NOTE:** Resets the clean filter baseline against which degradation is measured. This activates system log—BEZL0007.

  ⚠ **CAUTION: Make sure to reset the air filter life when and only when a new bezel filter is installed, the reset triggers a one-time maximum fan speed to establish a new baseline for air flow pressure in Active Sensing mode, failing to do so results in an incorrect thermal event.**

- ● **Scheduling Active Filter Check** — Default Monday 3:00 AM. Fans run at full speed to get a viable airflow reading. This happens by default every Monday at 3.00am. The user may change to the preferred time.

Table 7. Readings and alerts

System logs	Description	Action	Severity
BEZL0001	The filtered bezel is removed from the server.	No response required	Severity -3 (Info)
BEZL0003	Air filter functionality in the bezel is degraded.	Replace the Air filter with a cleaner air inlet.	Severity -2 (Warning)

Table 7. Readings and alerts (continued)

System logs	Description	Action	Severity
BEZL0005	The filtered bezel is installed in the chassis.	No response action required	Severity -3 (Info)
BEZL0006	Air filter system detected unsupported system configuration. Insufficient data to take air flow	Check that all nodes are installed and powered up. Reset filter life with new filter installed.	Severity -2 (Warning)
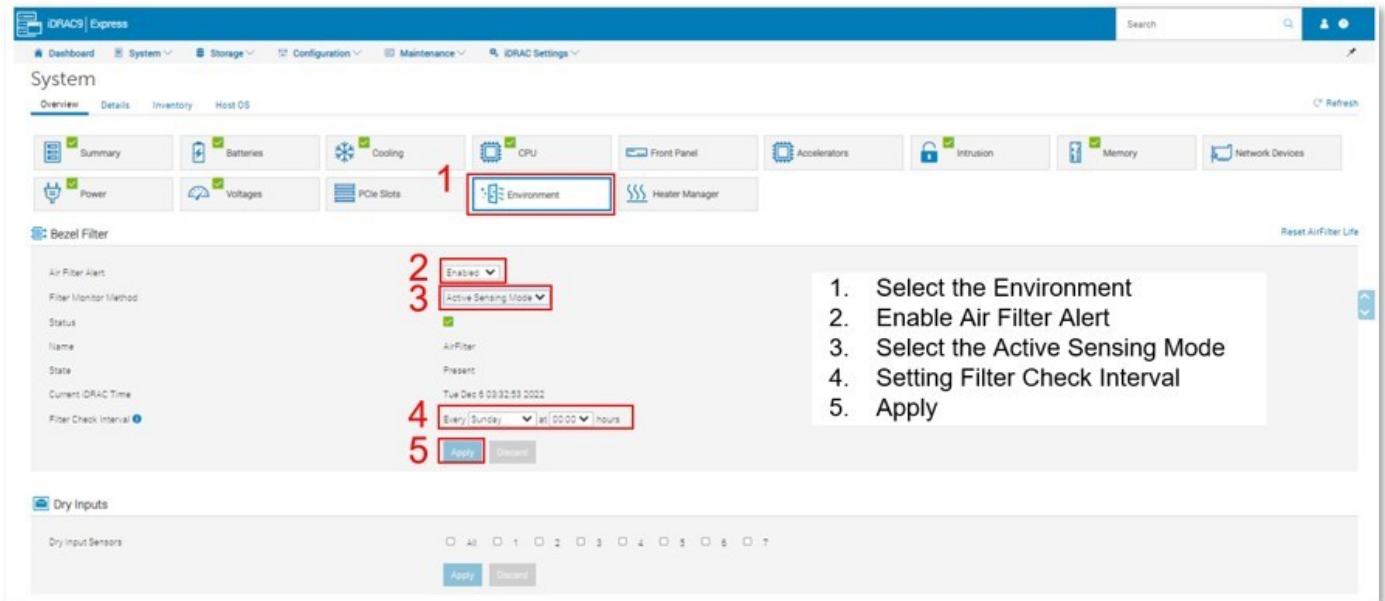
Figure 11. iDRAC interface of the Auto Sensing mode

Status LED control panel
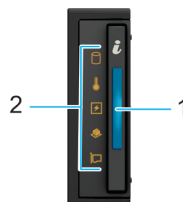
Figure 12. Status LED control panel

Table 8. Status LED control panel

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

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

Power button control panel
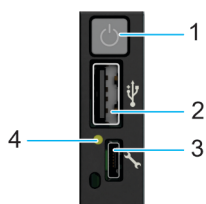
Figure 13. Power button control panel for Rear Accessed configuration

Table 9. Power button control panel

Item	Indicator or button	Icon	Description
1	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 an ACPI-compliant operating system.
2	USB 2.0-compliant port	⟔	The USB port is a 2.0-compliant. This port enables you to connect USB devices to the system. ⓘ **NOTE:** The USB 2.0 port is not available on Front Accessed configuration.
3	iDRAC Direct port (Micro-AB USB)	🔧	The iDRAC Direct port (Micro-AB USB) enables you to access the iDRAC direct features. For more information, see the 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 feet (0.91 meters). Performance could be affected by cable quality.
4	iDRAC Direct LED indicator	N/A	The iDRAC Direct LED indicator lights up to indicate that the iDRAC Direct port is actively connected to a device.

ⓘ **NOTE:** For more information see the Dell PowerEdge XR5610 Technical Specifications on the product documentation page.
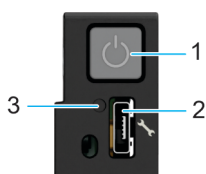
Figure 14. Power button control panel for Front Accessed configuration

Table 10. Power button control panel

Item	Indicator or button	Icon	Description
1	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 an ACPI-compliant operating system.
2	iDRAC Direct LED indicator	N/A	The iDRAC Direct LED indicator lights up to indicate that the iDRAC Direct port is actively connected to a device.

Table 10. Power button control panel (continued)

Item	Indicator or button	Icon	Description
3	iDRAC Direct port (Micro-AB USB)	🔧	The iDRAC Direct port (Micro-AB USB) enables you to access the iDRAC direct features. For more information, see the 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 feet (0.91 meters). Performance could be affected by cable quality.

ⓘ **NOTE:** For more information see the Dell PowerEdge XR5610 Technical Specifications on the product documentation page.

System configurations - inside view for PowerEdge XR5610
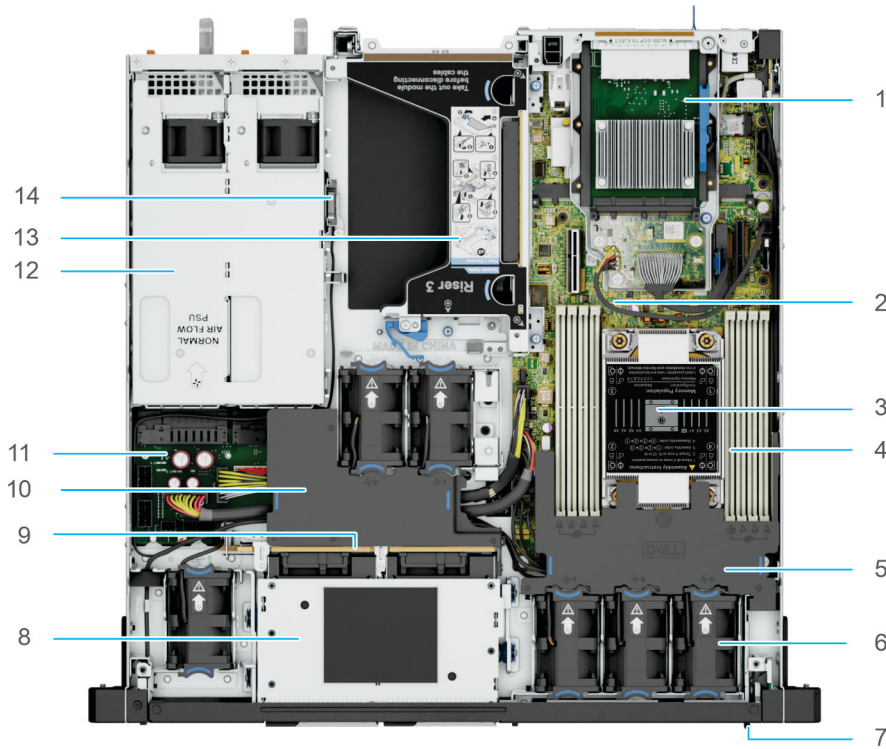
Figure 15. Inside the system - Rear Accessed configuration

1. OCP 3.0 card
2. System board
3. Processor and heat sink module
4. Memory DIMM sockets
5. Processor shroud
6. Cooling fans
7. Express service tag
8. Drive cage
9. Backplane
10. PCI air shroud
11. Power Interposer Board (PIB)
12. Power supply units

13. Riser 3
14. Intrusion switch
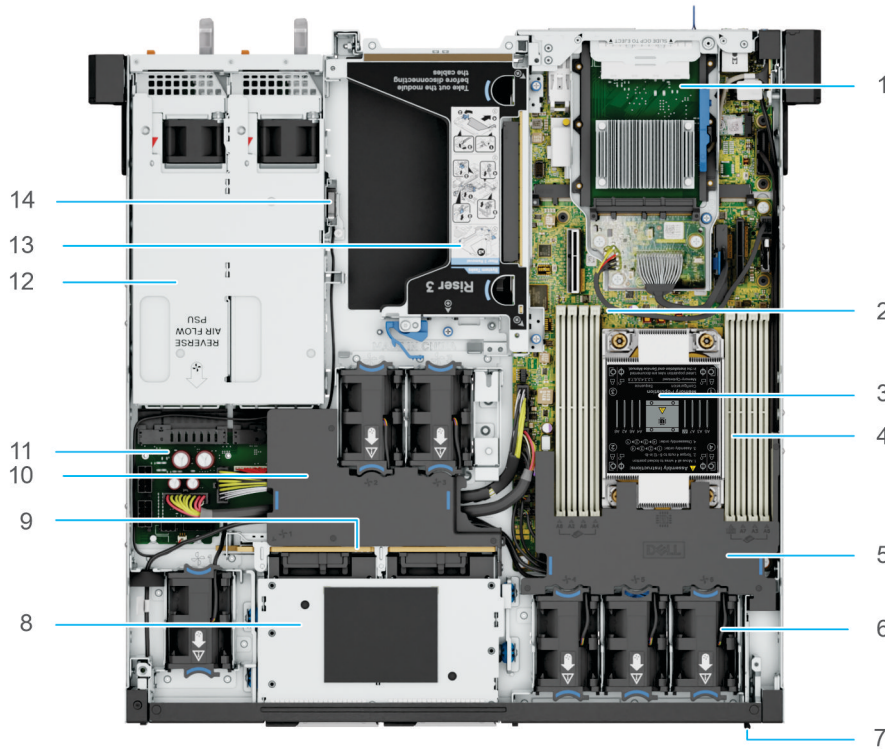
Figure 16. Inside the system - Front Accessed configuration

1. OCP 3.0 card
2. System board
3. Processor and heat sink module
4. Memory DIMM sockets
5. Processor shroud
6. Cooling fans
7. Express service tag
8. Drive cage
9. Backplane
10. PCI air shroud
11. Power Interposer Board (PIB)
12. Power supply units
13. Riser 3
14. Intrusion switch

Locating the Express Service Code and Service Tag

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

On the Rear Accessed configuration, the Express Service Tag is located on the front of the system, to the left of the power button control panel. On the Front Accessed configuration, it is located at the back of the system. The Express Service Tag includes system information such as the Service Tag, Express Service Code, Manufacture date, NIC, MAC address, QRL label, and so on.
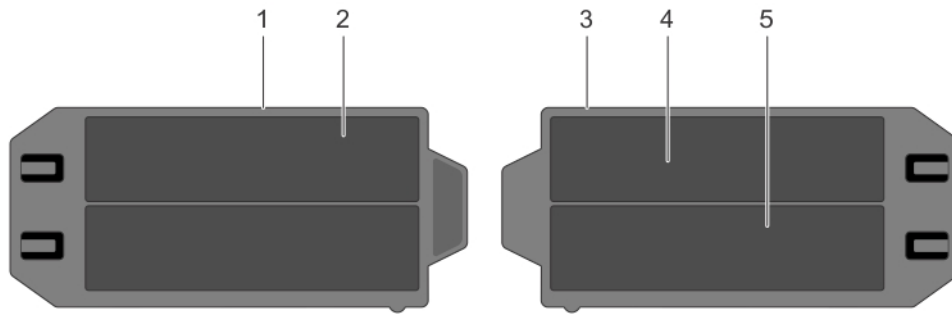
Figure 17. Locating the Express Service Code and Service tag

1. Express service tag (front view)
2. Express Service Tag label and QRL
3. Express service tag (back view)
4. iDRAC MAC address information label

   (i) **NOTE:** Record the iDRAC MAC address, and LOM MAC address before installing the server into a cabinet.

5. Network MAC address information label

The Mini Enterprise Service Tag (MEST) label is located on the back of the Rear Accessed configuration and front of the Front Accessed configurations. The MEST includes the Service Tag (ST), Express Service Code (Exp Svc Code), and Manufacture Date (Mfg. Date). The Exp Svc Code is used by Dell to route support calls to the appropriate personnel.
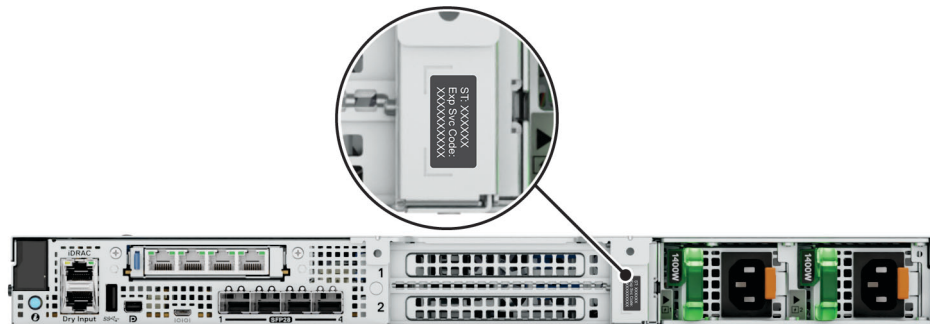
Figure 18. Locating the Mini Express Service Tag for Rear Accessed configuration
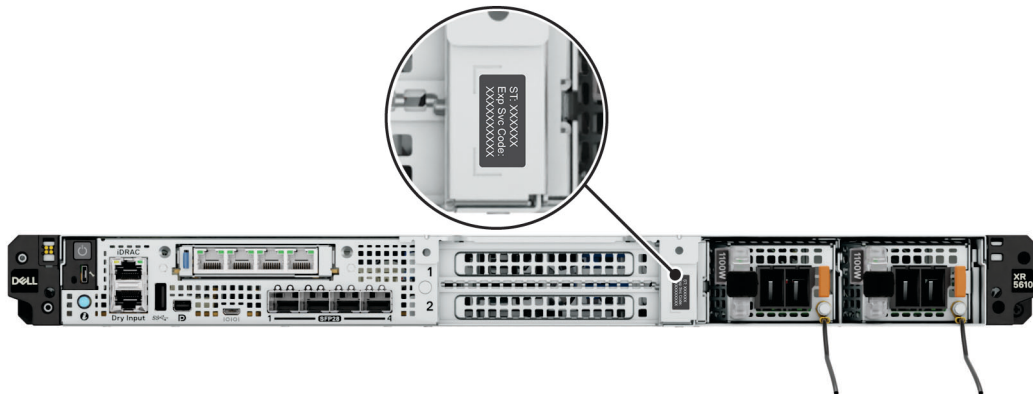
Figure 19. Locating the Mini Express Service Tag for Rear Accessed configuration

System information labels

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

Service Information

Electrical Overview

System Board Connections
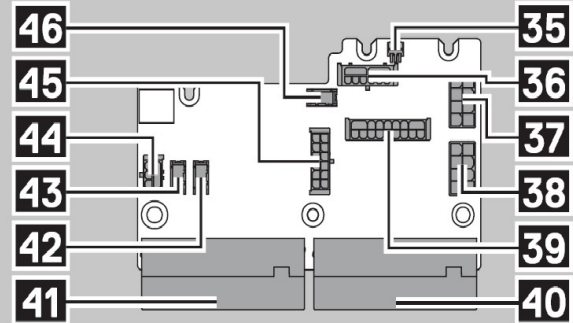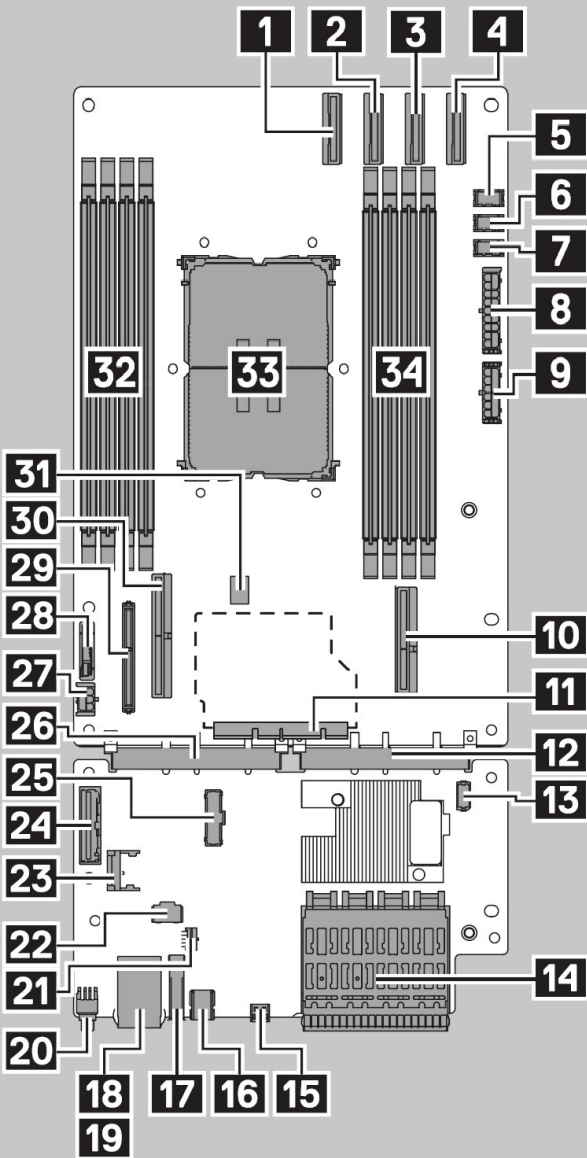
5	FAN 4	**26**	MIO_WEST
6	FAN 5	**27**	Riser 1 Power
7	FAN 6	**28**	Battery
8	SYS_PWR_CONN1	**29**	SL7_PCH_SA1
9	SYS_PWR_CONN2	**30**	SL6_CPU1_PA4
10	SL1_CPU1_PA1	**31**	Jumper
11	OCP Conn(Optional)	**32**	DIMMs For CPU
12	MIO_EAST	**33**	CPU
13	SMART NIC	**34**	DIMMs For CPU
14	LOM 25G Conn	**35**	Intrusion Switch
15	Serial Port	**36**	BP_PWR
16	Display Port	**37**	GPGPU_CONN1
17	USB Conn	**38**	GPGPU_CONN2
18	iDRAC RJ45	**39**	SYS_PWR_CONN1
19	Dry Input	**40**	Power Supply 2
20	System ID	**41**	Power Supply 1
21	Pogo Conn	**42**	FAN 2
22	Left Control Panel	**43**	FAN 3
23	TPM	**44**	Riser 3 Power
24	PIB Signal	**45**	SYS_PWR_CONN2
25	Right Control Panel	**46**	FAN 1

1 SL5_CPU1_PA3   **3** SL3_CPU1_PB2
2 SL4_CPU1_PB3   **4** SL2_CPU1_PA2

*Note: Rear accessed orientation is 180 degrees opposite to above.

Figure 20. Electrical overview

Service Information

System Touchpoints

■ Hot swap touchpoints: Components with terracotta touchpoints can be serviced while the system is running.

■ Cold swap touchpoints: Components with blue touchpoints require a full system shutdown before servicing.

Figure 21. System information
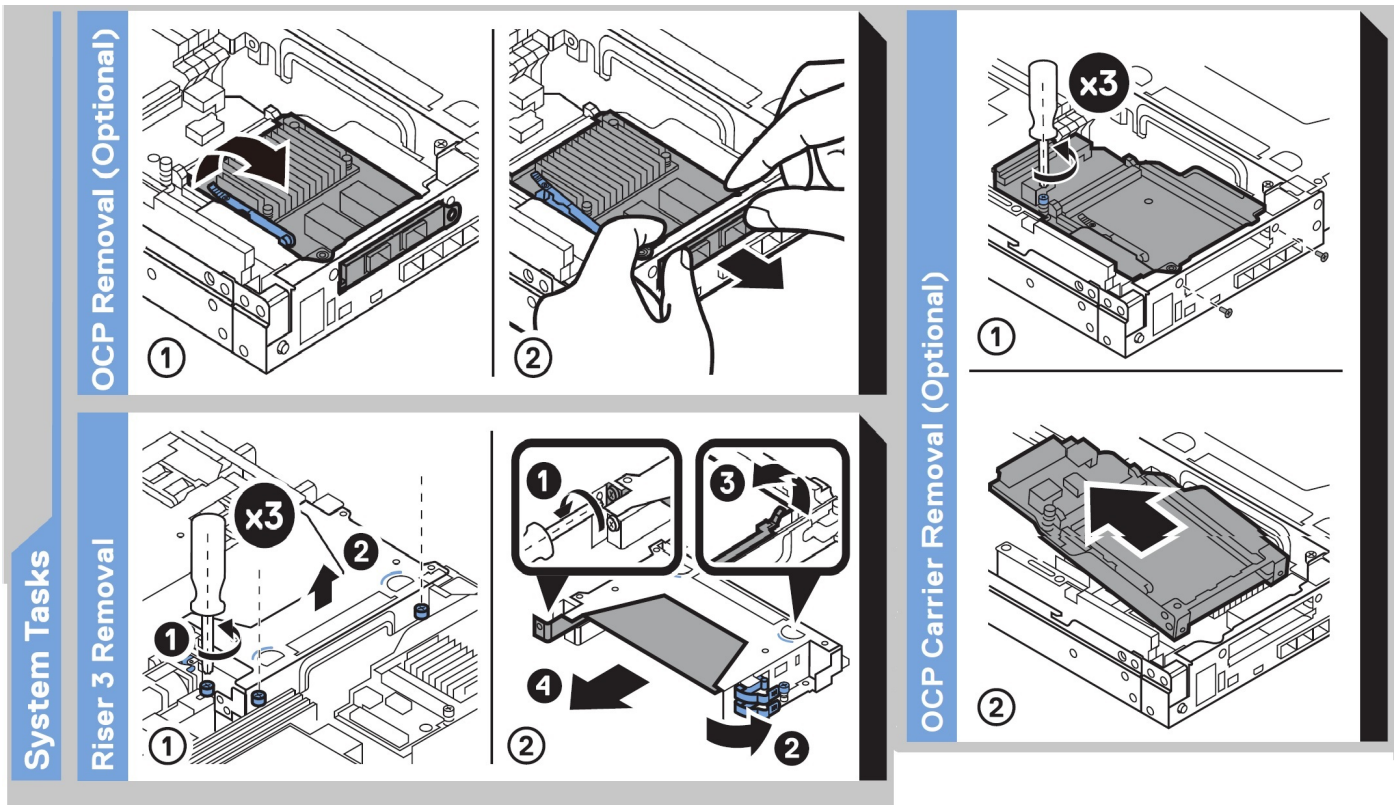
Figure 22. System task

Icon Legend

(i)	System ID	✈	Fan
Memory Bank		CPU 1	CPU
℗	Display Port	◉	Push
⏻	Power Switch/ Standby	🔧	Service
EST	Express Service Tag	|O|O|	Serial
SS←	USB 3.0	⚠	Warning: Fault
⚡	Power Supply		

Figure 23. Icon legend

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.

A26 sliding rails for 4-post and 2-post racks

- Support stab-in installation of the chassis to the rails.
- Support for tooled and tool-less installation in 19" EIA-310-E compliant square, unthreaded round hole and threaded round hole 4-post racks.
- Support for tolled installation in 2-post rack.
- Support full extension of the system out of the rack to allow serviceability of key internal components.
- Support for optional strain relief bar (SRB).
- Support for optional strain cable management arm (CMA).
  - (i) **NOTE:** The CMA is less useful if the rack is mixed with short depth server and long depth server

For situation where CMA support is not required, the outer CMA mounting brackets can be uninstalled from the sliding rails. This reduces the overall length of the rails and eliminates the potential interferences with rear mounted PDUs or the rear rack door

A27 sliding rails for Pelican custom racks

- Support stab-in installation of the chassis to the rails.
- Support for tooled installation in Pelican custom racks.
- Support full extension of the system our of the rack to allow serviceability of key internal components. Support for optional strain relief bar (SRB).
- Support for optional strain cable management arm (CMA).
  - (i) **NOTE:** The CMA is less useful if the rack is mixed with short depth server and long depth server

For situation where CMA support is not required, the outer CMA mounting brackets can be uninstalled from the sliding rails. This reduces the overall length of the rails and eliminates the potential interferences with rear mounted PDUs or the rear rack door

Technical specifications

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

Chassis dimensions
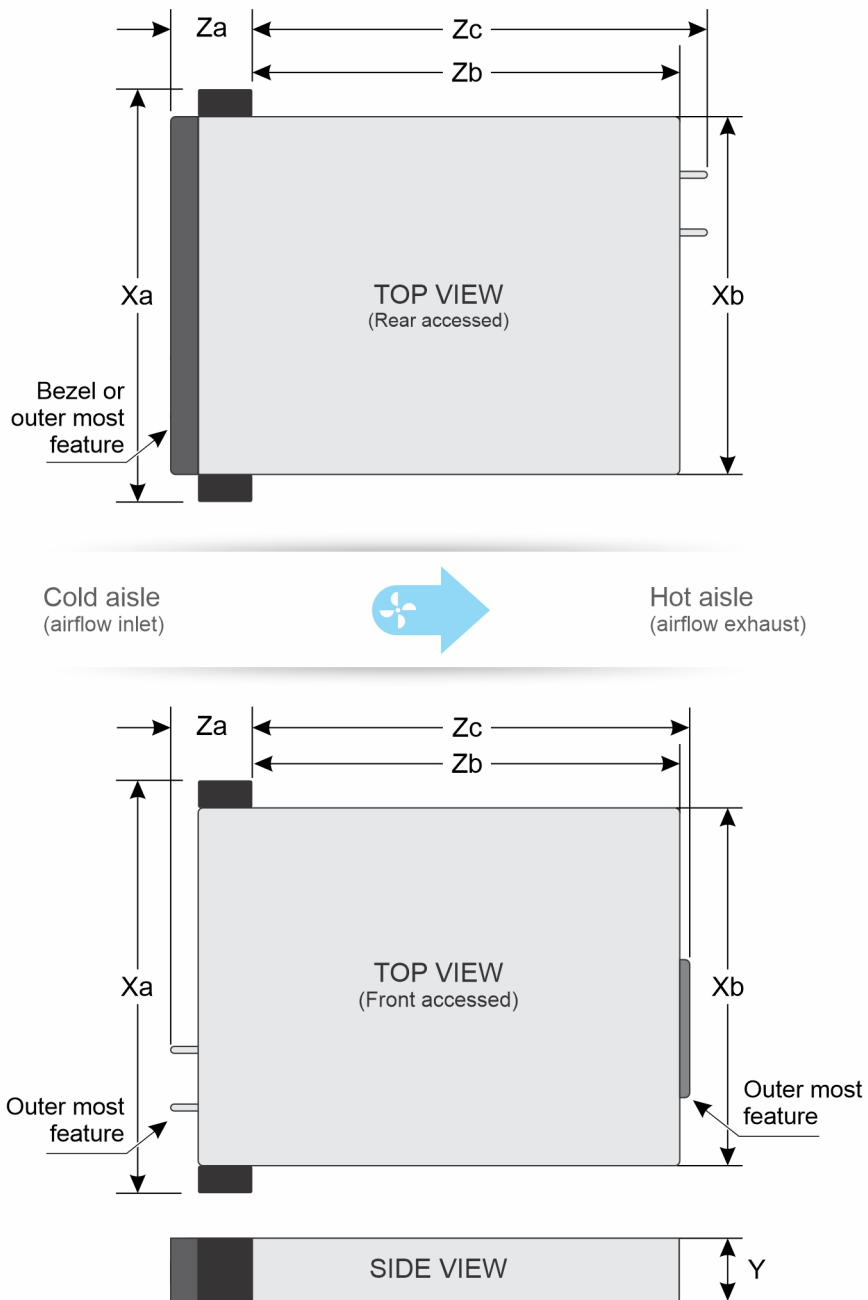
Figure 24. Chassis dimensions

Table 11. Chassis dimensions

Drives	Xa	Xb	Y	Za without bezel	Za with bezel	Zb	Zc
Rear Accessed configuration	482.6 mm (19 inches)	434 mm (17 inches)	42.8 mm (1.68 inches)	22.0 mm (0.86 inches)	47 mm (1.85 inches) Back of rack ear to most outer surface of bezel	435 mm (17.12 inches) Back of ear to main IO wall	442 mm (17.40 inches) Back of ear to PSU handle

Table 11. Chassis dimensions (continued)

Drives	Xa	Xb	Y	Za without bezel	Za with bezel	Zb	Zc
Front Accessed configuration	482.6 mm (19 inches)	434.0 mm (17 inches)	42.8 mm (1.68 inches)	47.75 mm (1.88 inches) (left ear) 31.35 mm (1.23 inches) (right ear)	148 mm (5.82 inches) Back of rack ear to most outer surface of bezel	409 mm (16.10 inches) Back of ear to chassis face	417 mm (16.41 inches) Back of ear to MIL drive bracket edge

ⓘ **NOTE:** Without the front bezel, Rear Accessed configuration support racks with 80 mm spacing from rack post to inside surface of rack door. With the front bezel installed, the Rear Accessed configuration system support racks with 100 mm spacing from rack post to inside surface of the rack door.

System weight

Table 12. PowerEdge XR5610 system weight

System configuration	Maximum weight (with all drives/SSDs/rails/bezel)
Rear Accessed configuration	11.27 kg (24.8 pounds)
Front Accessed configuration	11.37 kg (25.1 pounds)

Processor specifications

Table 13. PowerEdge XR5610 processor specifications

Supported processor	Number of processor supported
4th Generation Intel Xeon Scalable and Edge-Enhanced processor and Edge-Enhanced CPUs with up to 32 cores	One

ⓘ **NOTE:** It is recommended to use a maximum of two add-in cards with SPR EE-LCC CPU. Three add-in cards are supported, but this may result in an overall system performance degradation. .

PSU specifications

The PowerEdge XR5610 system supports up to two AC or DC power supply units (PSUs).

Table 14. PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage	DC High line 240 V DC	Low line	DC	Current
1800 W Mixed Mode	Titanium	5406 BTU/hr	50/60 Hz	200-240 V AC, autoranging	1800 W	1050 W	NA	10 A
	Titanium	5406 BTU/hr	NA	240 V DC	NA	NA	1400 W	8.2 A
1400 W Mixed Mode	Platinum	5406 BTU/hr	50/60 Hz	100–240 V AC, autoranging	1400 W	1050 W	NA	12 A-8 A
	Platinum	5406 BTU/hr	NA	240 V DC	NA	NA	1400 W	6.6 A

Table 14. PSU specifications (continued)

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage	DC		DC	Current
					High line 240 V DC	Low line		
1100 W Mixed Mode	Titanium	4299 BTU/hr	50/60 Hz	100–240 V AC, autoranging	1100 W	1050 W	NA	12 A-6.3 A
	Titanium	4299 BTU/hr	NA	240 V DC	NA	NA	1100 W	5.2 A
1100 W DC	NA	4265 BTU/hr	NA	-48-(-60) V	NA	NA	1100 W	27 A
800 W Mixed Mode	Platinum	3000 BTU/hr	50/60 Hz	100–240 V AC, autoranging	800 W	800 W	800 W	9.2 A-4.7 A
	Platinum	3000 BTU/hr	NA	240 V DC	NA	NA	800 W	3.8A
800 W DC	NA	NA	NA	-48 -(-60) V	NA	NA	800 W	20 A

(i) **NOTE:** Heat dissipation is calculated using the PSU wattage rating

(i) **NOTE:** When selecting or upgrading the system configuration, to ensure optimum power utilization, verify the system power consumption with the Enterprise Infrastructure Planning Tool available at Dell.com/calc.

(i) **NOTE:** For information about DC PSU cabling instructions, go to https://www.dell.com/poweredgemanuals > **XR Servers** > PowerEdge XR5610 > **Select This Product** > **Documentation** > **Manuals and Documents** > *Cabling instructions for – 48 – 60 V DC power supply*.

Power cords
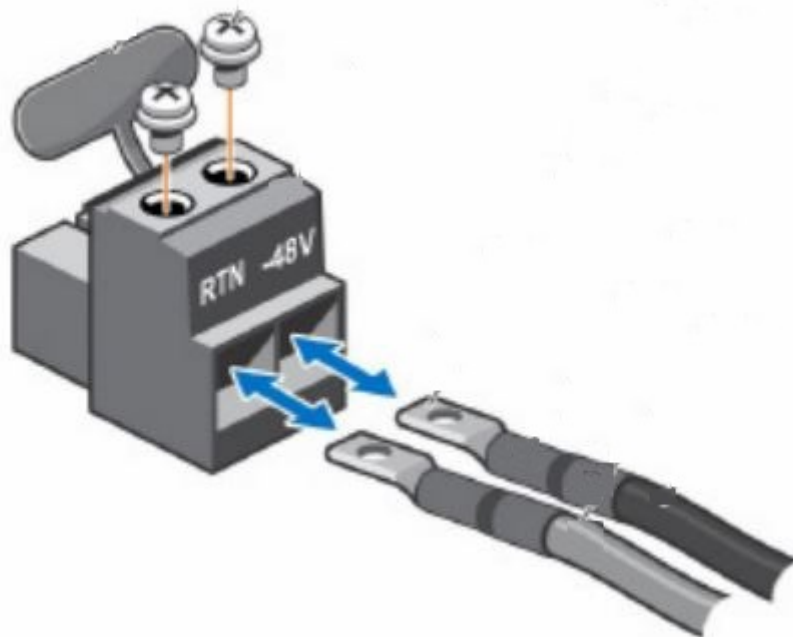
Figure 25. DC PSU power cord

Figure 26. AC PSU power cords

Table 15. PSU power cords types

Form factor	Output	Power cord
Redundant 60 mm	800 W Mixed Mode	C13
	800 W -48 — (-60) V DC	C13
	1100 W Mixed Mode	DC power cord
	1100 W -48 — (-60) V DC	C13
	1400 W Mixed Mode	C15
	1800 W Mixed Mode	DC power cord

Supported operating systems

The PowerEdge XR5610 system supports the following operating systems:

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

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

Cooling fans specifications

The PowerEdge XR5610 system supports six standard fans and requires all six fans to be installed.

System battery specifications

The PowerEdge XR5610 system supports CR 2032 3.0-V lithium coin cell system battery.

Expansion card riser specifications

The PowerEdge XR5610 system supports up to two PCI express (PCIe) Gen5 (Intel Xeon Scalable processor)/ PCIe Gen4 (Edge-Enhanced processor) expansion cards.

Table 16. Expansion card slots supported on the system board

PCIe slot	Risers	PCIe slot height	PCIe slot length	PCIe slot width
Slot 1	Riser 3	Full height	Half Length	x16
Slot 2	Riser 3	Full height	Half length	x16

Table 16. Expansion card slots supported on the system board (continued)

PCIe slot	Risers	PCIe slot height	PCIe slot length	PCIe slot width
Slot 3	Riser 1 (FLOP)	N/A	N/A	x16

ⓘ **NOTE:** Only use certified Optical Fiber Transceiver Class | Laser Products.

⚠ **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.**

⚠ **WARNING: Consumer-Grade GPU should not be installed or used in the Enterprise Server products.**

Memory specifications

ThePowerEdge XR5610 system supports the following memory specifications for optimized operation:

Table 17. Memory specifications

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

Table 18. Memory module sockets

Memory module sockets	Speed
8, 288-pin	4400 MT/s

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

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

Storage controller specifications

Table 19. PowerEdge XR5610 system storage controller specifications

Supported storage controller cards
Software RAID ● S160
Internal controllers ● PERC H965i ● PERC H755 ● PERC H355
External controllers ● HBA355e
Internal boot ● Boot Optimized Storage Subsystem (BOSS-N1): HWRAID 1, 2 x M.2 SSDs
SAS host bus adapters

Table 19. PowerEdge XR5610 system storage controller specifications (continued)

Supported storage controller cards
● HBA355i

ⓘ **NOTE:** The XR5610 backplane support up to SAS3 speed only for SAS drives.

Drives specifications

ThePowerEdge XR5610 system supports 4 x 2.5-inch SAS, SATA, or NVMe SSD drives.

ⓘ **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**.

ⓘ **NOTE:** Spinning hard drives are not supported in the XR5610.

Ports and connectors specifications

USB ports specifications

Table 20. PowerEdge XR5610 system USB ports specifications for Rear Accessed configuration

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

Table 21. PowerEdge XR5610 system USB ports specifications for Front Accessed configuration

Front		Rear	
USB port type	No. of ports	USB port type	No. of ports
USB 3.0-compliant port	One	None	
iDRAC Direct port (Micro-AB USB 2.0-compliant port)	One		

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

Display port specifications

The PowerEdge XR5610 system supports 1 x Mini-DisplayPort on the rear of the Rear Accessed configuration and on the front of the Front Accessed configuration.

GPU specifications

The PowerEdge XR5610 system supports up to two 75 W/150 W (single-width, low-profile, and half-length) GPUs.

iDRAC9 port specifications

The PowerEdge XR5610 system supports 1 x RJ45 with port status LEDs for iDRAC remote management (dedicated port only) on rear of the Rear Accessed configuration and on the front of the Front Accessed configurations.

Serial connector specifications

The PowerEdge XR5610 system supports one Micro USB Type B serial connector located on the rear of the Rear Accessed configuration and on the front of the Front Accessed configuration.

RJ45 dry contact

The PowerEdge XR5610 system supports 1 x RJ45 for dry contact on rear of the Rear Accessed configuration and on the front of the Front Accessed configuration.

To enhance usage in IoT space, the XR5610 comes with dry input sensor. Each input are configurable and manageable in the iDRAC interface. These are interruptible inputs to iDRAC. Dry means no energy is supplied to the contacts.
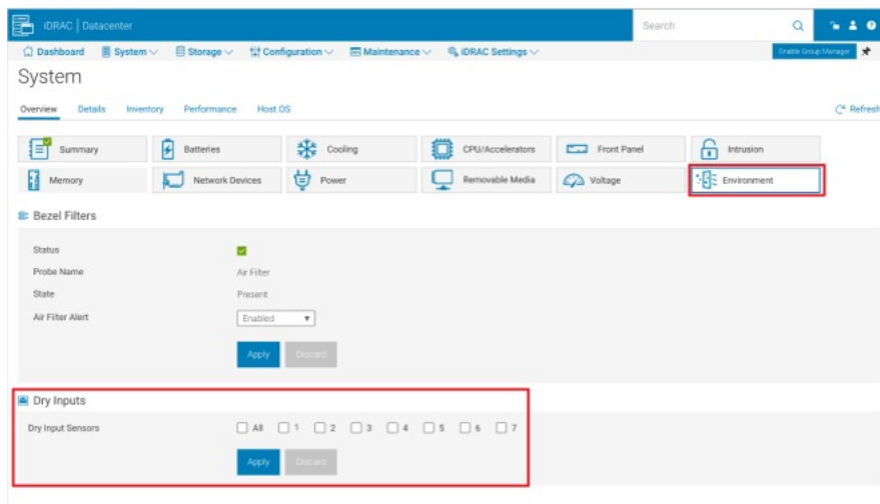
Figure 27. iDRAC interface for Dry Input sensors

(i) **NOTE:** The RJ45 for dry contact does not support IP function.

The default state of the dry inputs are off/disabled. User will have 7 (one for each dry input) enable/disable (default) control that must be enabled before logging will occur.
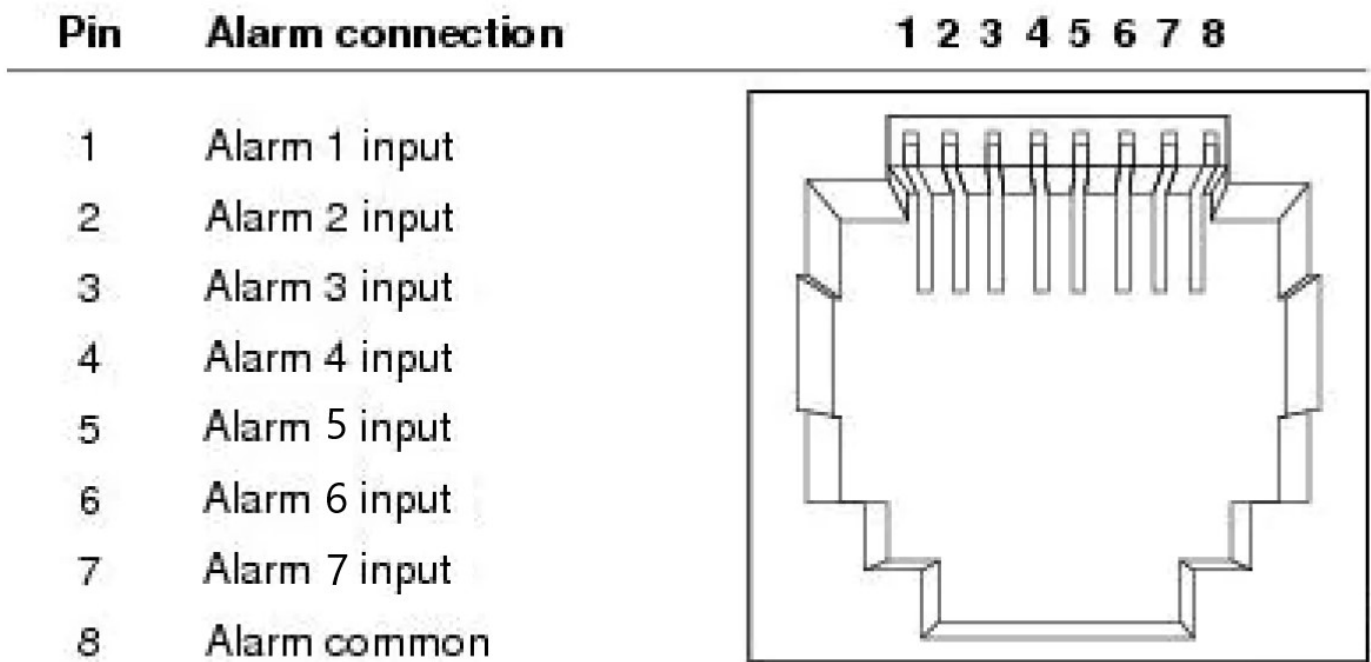
Figure 28. Dry input connection diagram

The 7 dry inputs are interruptible inputs to iDRAC.They have the following characteristics:

- Monitored by iDRAC for state transition and LC event will be logged for each state transition.
- NOT modeled as IPMI sensors but LC event only sensors. The current state of the input is not monitored or displayed anywhere.
- Event Log - transitions (Open to close or close to Open) will be logged in LC only.

Table 22. Proposed EEMI messages

Message ID	Message	RRA	DD	Severity
DCI1000	Dry input <input index> is transitioned to Open state.	None.	None	Severity -3 (Info)
DCI1001	Dry input <input index> is transitioned to Close state.	None.	None	Severity -3 (Info)

NIC port specifications

The PowerEdge XR5610 system supports 4 embedded LOM ports that provide 4 x 25 GbE SFP28.

There is also a dedicated iDRAC management port that supports 1GbE.

Table 23. Network port specifications

Feature	Specifications
LOM	10 GbE, 25 GbE (i) **NOTE:** Lowest connection speed for LOM is 10 GbE.
RJ45 for iDRAC	1 GbE
OCP card (3.0)	1 GbE, 10 GbE, 25 GbE

(i) **NOTE:** The system allows either NIC card or OCP card or both to be installed in the system.

NOTE: Shared management of iDRAC is capable through the embedded LOM and OCP ports.

Video specifications

The PowerEdge XR5610 system supports integrated Matrox G200 graphics controller with 16 MB of video frame buffer.

Table 24. Supported video resolution options for the system

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

Environmental specifications

The PowerEdge XR5610 system operates in these environmental categories: ASHRAE A2/A3/A4 and Edge1 (50°C) and Edge2 (55°C).

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

Table 25. Continuous operation specifications for ASHRAE A2

Feature	Allowable continuous operations
Temperature range for altitudes <= 900 m (<= 2953 ft)	10–35°C (50–95°F) with no direct sunlight on the equipment
Humidity percent range (non-condensing at all times)	8% RH with -12°C minimum dew point to 80% RH with 21°C (69.8°F) maximum dew point
Operational altitude de-rating	Maximum temperature is reduced by 1°C/300 m (33.8°F/984 Ft) above 900 m (2953 Ft)

Table 26. Continuous operation specifications for ASHRAE A3

Feature	Allowable continuous operations
Temperature range for altitudes <= 900 m (<= 2953 ft)	5–40°C (41–104°F) with no direct sunlight on the equipment
Humidity percent range (non-condensing at all times)	8% RH with -12°C minimum dew point to 85% RH with 24°C (75.2°F) maximum dew point
Operational altitude de-rating	Maximum temperature is reduced by 1°C/175 m (33.8°F/574 Ft) above 900 m (2953 Ft)

Table 27. Continuous operation specifications for ASHRAE A4

Feature	Allowable continuous operations
Temperature range for altitudes <= 900 m (<= 2953 ft)	5–45°C (41–113°F) with no direct sunlight on the equipment
Humidity percent range (non-condensing at all times)	8% RH with -12°C minimum dew point to 90% RH with 24°C (75.2°F) maximum dew point
Operational altitude de-rating	Maximum temperature is reduced by 1°C/125 m (33.8°F/410 Ft) above 900 m (2953 Ft)

Table 28. Continuous operation specifications for Edge1 (50°C) and Edge2 (55°C)

Feature	Allowable continuous operations
Temperature range for altitudes <= 900 m (<= 2953 ft)	(-5)–55°C (23–131°F) with no direct sunlight on the equipment
Humidity percent range (non-condensing at all times)	8% RH with -12°C minimum dew point to 90% RH with 24°C (75.2°F) maximum dew point
Operational altitude de-rating	Maximum temperature is reduced by 1°C/80 m (33.8°F/410 Ft) above 900 m (2953 Ft)

(i) **NOTE:** Do not perform a cold startup below 5°C.

Table 29. Common environmental specifications for ASHRAE A2, A3, A4, Edge1 (50°C) and Edge2 (55°C)

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

(i) **NOTE:** Do not perform a cold startup below 5°C

Table 30. Maximum vibration specifications for the system

Maximum vibration	Specifications

Operating	● 0.21 Grms at 5 Hz to 500 Hz (all operation orientations)
	● For Military (with Military tool kit),
	  ○ Method 514.8; Category 20(Marine Vehicles) Annex D 2.9a (Wheeled vehicles) Procedure I, 5 Hz to 500 Hz
	  ○ Method 514.8; Category 21(Ground Vehicles) Annex D 2.10, procedure I, 10 Hz to 100 Hz

Storage	● 1.88 Grms at 10 Hz to 500 Hz for 15 minutes (all six sides tested) ● For Military (with Military tool kit), ○ Method 514.6; Category 4. 1 Hour per axis, 3 axes, 5-500 Hz, X@0.76 Grms, Y@0.21 Grms, Z@1.08 Grms , 60 minutes/axis

Table 31. Maximum shock pulse specifications for the system

Maximum shock pulse	Specifications
Operating	- Six consecutively executed shock pulses in the positive and negative x, y, and z axes of 6 G for up to 11 ms.(4 pulse on each side of the system) - For Military (with Military tool kit) - Method 516.8 Procedure I, 40G, 11ms, 3 shocks, +-per direction, 3 axes
Operating (Navy)	MIL-STD-901E, Grade A, Class 2, Type A, in approved military transit case
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. - For Military (with Military tool kit) - Method 516.8 Procedure V, 40G, 11ms, 3 shocks, +-per direction, 3 axes

Particulate and gaseous contamination specifications

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

Table 32. Particulate contamination specifications

Particulate contamination	Specifications
Air filtration	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit. (i) **NOTE:** This condition applies to data center environments only. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor. (i) **NOTE:** Air entering the data center must have MERV11 or MERV13 filtration.
Conductive dust	Air must be free of conductive dust, zinc whiskers, or other conductive particles. (i) **NOTE:** This condition applies to data center and non-data center environments.
Corrosive dust	- Air must be free of corrosive dust. - Residual dust present in the air must have a deliquescent point less than 60% relative humidity. (i) **NOTE:** This condition applies to data center and non-data center environments.
Walk-Up Edge Data Center or Cabinet (sealed, closed loop environment)	Filtration is not required for cabinets that are anticipated to be opened 6 times or less per year. Class 8 per ISO 1466-1 filtration as defined above is required otherwise (i) **NOTE:** In environments commonly above ISA-71 Class G1 or that may have known challenges, special filters may be required.

Table 33. Gaseous contamination specifications

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

(i) **NOTE:** Maximum corrosive contaminant levels measured at ≤50% relative humidity.

Rugged certifications and specifications

The PowerEdge XR5610 supports the rugged environment space for temperatures up to 55°C through custom configurations. These configurations are geared for the Telecom (or Telco) and Military industries and hence meet industry-specific standards in addition to the maximum temperature requirement of 55°C. The Telco configurations will be tested to the NEBS requirements outlined in the GR-63 and GR-1089 Telcordia specifications. The Military configurations will be tested to: MIL-STD-810H, MIL-DTL-901E and MIL-STD-461G.

Table 34. Hardened certifications and specifications

Industry	Configuration	Description
Telco	GR-1089-CORE	Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment
	GR-63-CORE	NEBS Requirements: Physical Protection
	SR-3580 (NEBS Level 3)	NEBS Criteria Levels
	GR-3108-CORE (Class 1)	Network Equipment in the Outside Plant (OSP). An exception is made for cold boot at 0C instead of -5C.
Military	MILSTD 810H	Environmental engineering considerations and laboratory test
	MILSTD 461G///	Requirements for the control of electromagnetic interference characteristic of subsystems and equipment
	MILSTD 901E	High impact shock test – Shipboard
	MILSTD 1474E	Department of Defense Design Criteria Standard Noise Limits

Thermal restriction matrix

Table 35. Processor thermal restrictions- Front Accessed configuration

Chassis configuration						
Ambient temperature		ASHARE A2 (Max 35°C)	ASHARE A3 (Max 40°C)	ASHARE A4 (Max 45°C)	Edge1 (Max 50°C)	Edge2 (Max 55°C)
Intel Xeon Gold 6433N	205 W	STD heat sink	STD heat sink	STD heat sink	HPR heat sink	HPR heat sink
Intel Xeon Gold 6423N	195 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 6403N	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 5423N	145 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 6438N	205 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 6421N	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 5411N	165 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 5412U	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 5416S	150 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink

Table 35. Processor thermal restrictions- Front Accessed configuration (continued)

Chassis configuration						
Ambient temperature		ASHARE A2 (Max 35°C)	ASHARE A3 (Max 40°C)	ASHARE A4 (Max 45°C)	Edge1 (Max 50°C)	Edge2 (Max 55°C)
Intel Xeon Gold 3408U	125 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink

Table 36. Memory thermal restrictions- Front Accessed configuration

Chassis configuration						
Ambient temperature		ASHARE A2 (Max 35°C)	ASHARE A3 (Max 40°C)	ASHARE A4 (Max 45°C)	Edge1 (Max 50°C)	Edge2 (Max 55°C)
Memory	DDR5 RDIMM 128 GB	Supported	Not supported	Not supported	Not supported	Not supported
	DDR5 RDIMM 64 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 32 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 16 GB	Supported	Supported	Supported	Supported	Supported

Table 37. Commodities thermal restrictions - Front Accessed configuration

Chassis configuration					
Ambient temperature	ASHARE A2 (Max 35°C)	ASHARE A3 (Max 40°C)	ASHARE A4 (Max 45°C)	Edge1 (Max 50°C)	Edge2 (Max 55°C)
Nvidia GPU A2	A2 support up to 50°C				Not supported
Nvidia GPU L4	L4 support up to 50°C				Not supported
2.5-inch NVMe SSD	NVMe support up to 35°C	Not supported	Not supported	Not supported	Not supported
2.5-inch SAS SSD	SAS SSD support up to 45°C	SAS SSD support up to 45°C	SAS SSD support up to 45°C	Not supported	Not supported
PCIe COMM Card	Not supported				
OCP COMM Card	Non-Dell qualified OCP card is not supported				
Active Optical Cables / Transceivers	Transceiver above 2.5 W only with 85°C spec is supported.				
PSU	Dual PSU in redundant mode is required while ambient > 50°C, single PSU is not supported				

Table 38. Processor thermal restrictions- Rear Accessed configuration

Chassis configuration						
Ambient temperature		ASHARE A2 (Max 35°C)	ASHARE A3 (Max 40°C)	ASHARE A4 (Max 45°C)	Edge1 (Max 50°C)	Edge2 (Max 55°C)
Intel Xeon Gold 6433N	205 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 6423N	195 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 6403N	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Bronze 5423N	145 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 6438N	205 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 6421N	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 5412U	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 5411N	165 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink

Table 38. Processor thermal restrictions- Rear Accessed configuration (continued)

Chassis configuration						
Ambient temperature		ASHARE A2 (Max 35°C)	ASHARE A3 (Max 40°C)	ASHARE A4 (Max 45°C)	Edge1 (Max 50°C)	Edge2 (Max 55°C)
Intel Xeon Gold 5416S	150 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Bronze 3408U	125 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink

Table 39. Memory thermal restrictions- Rear Accessed configuration

Chassis configuration						
Ambient temperature		ASHARE A2 (Max 35°C)	ASHARE A3 (Max 40°C)	ASHARE A4 (Max 45°C)	Edge1 (Max 50°C)	Edge2 (Max 55°C)
Memory	DDR5 RDIMM 128 GB	Supported	Not supported	Not supported	Not supported	Not supported
	DDR5 RDIMM 64 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 32 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 16 GB	Supported	Supported	Supported	Supported	Supported

Table 40. Commodities thermal restrictions - Rear Accessed configuration

Chassis configuration						
Ambient temperature		ASHARE A2 (Max 35°C)	ASHARE A3 (Max 40°C)	ASHARE A4 (Max 45°C)	Edge1 (Max 50°C)	Edge2 (Max 55°C)
M.2 NVMe (BOSS-N1)	Micron 7400	Support up to 35°C	Not supported	Not supported	Not supported	Not supported
	Micron 7450	Support up to 35°C	Not supported	Not supported	Not supported	Not supported
	Hynix PE8010	Support up to 35°C	Not supported	Not supported	Not supported	Not supported
	Hynix PE9010	Support up to 35°C	Not supported	Not supported	Not supported	Not supported
Nvidia GPU A2		A2 support up to 40°C		Not supported	Not supported	Not supported
Nvidia GPU L4		L4 support up to 40°C		Not supported	Not supported	Not supported
2.5-inch NVMe SSD		NVMe support up to 35°C	Not supported	Not supported	Not supported	Not supported
2.5-inch SAS SSD		SAS SSD support up to 45°C			Not supported	Not supported
PERC card		PERC card support up to 45°C			Not supported	Not supported
PCIe COMM Card		- Above 45°C, PCIe cards support Extended Operating Temperature (EOT) Range is required. - Above 45°C, PCIe card power > 25W is not supported. - Non-Dell qualified PCIe card is not supported.				
OCP COMM Card		OCP card support up to 35°C. Non-Dell qualified OCP card is not supported.	Not supported	Not supported	Not supported	Not supported
Active Optical Cables / Transceivers		- Optic cables / transceivers with 70°C spec support up to 35°C. - Optic cables / transceivers with 85°C spec support up to 45°C. - Transceiver above 2.5W is only supported with 85°C spec up to 35°C.			Not supported	Not supported
PSU		Dual PSU in redundant mode is required while ambient > 50°C, single PSU is not supported				

Other Restrictions

- Hot swap fan is not supported on XR5610
- Min. cold boot temperature at ≥ 5°C. System operating temperature is -5°C—55°C
- DIMM Blank is required on empty slots.
- OCP blank is required while empty slot.
- OCP is not supported with high TDP Edge-Enhanced CPU
- PCIE blank is required on empty slots.
- PSU blank is required on empty slot.
- 2.5-inch drive blank is required on empty slots.
- Please notice that the fan speed may increase at ambient <0°C with SAS/SATA SSD. This indicates the fan is working as design for overall system stability.

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.

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

ⓘ **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 41. Interfaces to set up iDRAC IP address

Interface	Documentation links
iDRAC Settings utility	Integrated Dell Remoet Access Controller User's Guide or for system specific Integrated Dell Remote Access Controller User's Guide.**Product Support** page of your system > **Documentation**.

Table 41. 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 www.dell.com/support/article/sln000178115.
OpenManage Deployment Toolkit	Dell OpenManage Deployment Toolkit User's Guide > Open Manage Deployment Toolkit.
iDRAC Direct	Integrated Dell Remote Access Controller User's Guide or for system specific Integrated Dell Remote Access Controller User's Guide > **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 www.dell.com/support/article/sln000178115.
Lifecycle Controller	Dell Lifecycle Controller User's Guide or for system specific Dell Lifecycle Controller User's Guide > **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 www.dell.com/support/article/sln000178115.

ⓘ **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

If you opted for legacy password, use the iDRAC legacy username and password - `root` and `calvin`. If you opted for Force Change Password, for the initial login to iDRAC use the username and password - `root` and `calvin`. Then you are prompted to create a password of your choice before proceeding.

ⓘ **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 www.dell.com/support/article/sln000178115.

You can also access iDRAC using command-line protocol - RACADM. For more information, see the Integrated Dell Remote Acces Controller RACADM CLI Guide.

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.

How to find the iDRAC MAC address of new PowerEdge servers before delivery

For more information, see https://www.dell.com/support/kbdoc/en-us/000142728/how-to-find-the-idrac-mac-address-of-new-poweredge-servers-before-delivery?lang=en.

How to reset random password URL into ISM

For more information, see https://www.dell.com/support/kbdoc/en-us/000133536/dell-poweredge-what-is-the-default-username-and-password-for-idrac.

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 42. Resources to install the operating system

Resource	Documentation links
iDRAC	Integrated Dell Remote Access Controller User's Guide or for system specific, go to Integrated Dell Remote Access Controller User's Guide > **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 www.dell.com/support/article/sln000178115.
Lifecycle Controller	Dell Lifecycle Controller User's Guide or for system specific, go to Dell Lifecycle Controller User's Guide > **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 www.dell.com/support/article/sln000178115.
OpenManage Deployment Toolkit	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit.
Dell certified VMware ESXi	www.dell.com/virtualizationsolutions.
Zero Touch, Bare-Metal Server Provisioning	Zero-Touch, Bare-metal Server Provisioning Using the iDRAC9 with Auto Config

ⓘ **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 43. Options to download firmware

Option	Documentation link
Using Integrated Dell Remote Access Controller Lifecycle Controller (iDRAC with LC)	www.dell.com/idracmanuals
Using Dell Repository Manager (DRM)	www.dell.com/openmanagemanuals > Repository Manager
Using Dell 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 44. 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 or for system specific, go to Integrated Dell Remote Access Controller User's Guide > **Product Support** page of your system > **Documentation** . (i) **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see www.dell.com/support/article/sln000178115.

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.

   (i) **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.

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.

ⓘ **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 45. 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 45. 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 46. 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.
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.
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 47. System Information details

Option	Description
System Model Name	Specifies the system model name.
System BIOS Version	Specifies the BIOS version installed on the system.
System Management Engine Version	Specifies the current version of the Management Engine firmware.
System Service Tag	Specifies the system Service Tag.

Table 47. System Information details (continued)

Option	Description
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 48. Memory Settings details

Option	Description
System Memory Size	Specifies the size of the system memory.
System Memory Type	Specifies the type of memory that is installed in the system.
System Memory Speed	Specifies the speed of the system memory.
System Memory Voltage	Specifies the voltage of the system memory.
Video Memory	Specifies the size of the video memory.
System Memory Testing	Specifies whether the system memory tests are run during system boot. The two options available are **Enabled** and **Disabled**. This option is set to **Disabled** by default.
Memory Operating Mode	Specifies the memory operating mode. The option is available and is set to **Optimizer Mode**, by default. Options such as Fault Resilient Mode and NUMA Fault Resilient Mode are available for support when the Advanced RAS capability processor is installed on the system.
Current State of Memory Operating Mode	Specifies the current state of the memory operating mode.
Fault Resilient Mode Memory Size [%]	Select to define the percent of total memory size that must be used by the fault resilient mode, when selected in the Memory Operating mode. When Fault Resilient Mode is not selected, this option is unavailable and not used by Fault Resilient 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.
ADDDC Settings	Enables or disables the ADDDC Settings feature. When Adaptive Double DRAM Device Correction (ADDDC) is enabled, failing DRAMs are dynamically mapped out. When set to **Enabled** it can impact the system performance under certain workloads. This feature is applicable for x4 DIMMs only. This option is set to **Enabled** by default.
Memory Training	When the 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 48. 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.
Memory Paging Policy	This option sets the Memory Paging Policy. When set to **Closed Paging** the DRAM page is closed immediately after every read or write.
Memory Map Out	This option controls DIMM slots on the system. This option is set to **Enabled** by default. It allows to disable system installed DIMMs.
Correctable Error Logging	Enables or disables correctable error logging. This option is set to **Disabled** by default.
DIMM Self Healing (Post Package Repair) on Uncorrectable Memory Error	Enables or disables Post Package Repair (PPR) on uncorrectable memory error. This option is set to **Enabled** by default.

Processor Settings

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

Table 49. 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 reports all the logical processors. If this option is set to **Disabled**, the BIOS reports only one logical processor per core. This option is set to **Enabled** by default.
Virtualization Technology	Enables or disables the virtualization technology for the processor. This option is set to **Enabled** by default.
Directory Mode	Enables or disables the directory mode. This option is set to **Enabled** by default.
Kernel DMA Protection	This option is set to **Disabled** by default. It is enabled for Secure Launch (Firmware Protection) support on Windows 2022.
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	Determines how BIOS enumerates processor cores in the ACPIMADT table. When set to **Round Robin**, processor cores are enumerated in round robin order. When set to **Linear**, processor cores are enumerated

Table 49. Processor Settings details (continued)

Option	Description
	across all Dies within a socket before enumerating additional sockets for a linear distribution.
UMA Based Clustering Status	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 2-way.
UPI Prefetch	Enables you to get the memory read started early on DDR bus. The Ultra Path Interconnect (UPI) Rx path spawns the MemSpecRD that is read to Integrated Memory Controller (iMC) directly. This option is set to **Disabled** 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. This option is set to **Enabled** by default. You can enable this option to opportunistically fill the dead lines in LLC or disable the option to not fill 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.
Dynamic SST-Performance Profile	Enables you to reconfigure the processor using Dynamic or Static Speed Select Technology. This option is set to **Disabled** by default
SST-Performance Profile	Enables you to reconfigure the processor using Speed Select Technology.
Intel SST-BF	Enables Intel SST-BF. This option is displayed if Performance Per Watt (OS) or Custom (when OSPM is enabled) system profiles are selected. This option is set to **Disabled** by default.
Intel SST-CP	Enables Intel SST-CP. 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 Setting	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.
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.

Table 49. Processor Settings details (continued)

Option	Description
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.
Unicore 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.
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 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 1	ⓘ **NOTE:** Depending on the number of processors, there might be up to n processors listed. The following settings are displayed for each processor:

Table 50. 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	Displays the amount of memory in the processor cache
Level 3 Cache	Displays the amount of memory in the processor cache
Number of Cores	Specifies the number of cores per processor.
Maximum Memory Capacity	Specifies the maximum memory capacity per processor.
Microcode	Specifies the processor microcode version.

SATA Settings

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

Table 51. SATA Settings details

Option	Description
Embedded SATA	Enables the embedded SATA option to be set to **Off**, **AHCI mode** , or **RAID mode**. This option is set to **AHCI Mode** by default. ⓘ **NOTE:** No ESXi and Ubuntu operating system support under RAID mode.
Security Freeze Lock	Sends **Security Freeze Lock** command to the embedded SATA drive 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 **Sends Enable** or **Disabled Write Cache** to the embedded SATA drives during POST. This option is applicable only for AHCI Mode. This option is set to **Disabled** by default.
Port n	Sets the drive type of the selected device. For **AHCI Mode**, BIOS support is always enabled.

Table 52. Port n

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

NVMe Settings

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

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

Table 53. 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	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.

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

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

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

Table 54. Boot Settings details

Option	Description
Boot Mode	Enables you to set the boot mode of the system. If the operating system supports UEFI, you can set this option to UEFI. Setting this field to BIOS allows compatibility with non-UEFI operating systems. This option is set to **UEFI** by default. ⚠ **CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.** ⓘ **NOTE:** Setting this field to UEFI disables the **BIOS Boot Settings** menu.
Boot Sequence Retry	Enables or disables the Boot sequence retry feature 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.
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.
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 55. 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**.

(i) **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.

   (i) **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**.

(i) **NOTE:** Network Settings are not supported in BIOS boot mode.

Table 56. 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>. This is set to **nqn.1988-11.com.dell:<model name>.<model number>.<service tag>** by default.
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

Table 56. Network Settings details (continued)

Option	Description
	generated value. A value of all FF is not allowed. This is set to **FFFFFFFF-FFFF-FFFF-FFFF-FFFFFFFFFFFF** by default.
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 57. 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 58. HTTP Device n Settings details

Option	Description
Interface	Specifies NIC interface used for the HTTP device.
Protocol	Specifies Protocol used for HTTP device. This option is set to **IPv4** or **IPv6**. This option is set to **IPv4** by default.
VLAN	Enables Vlan for HTTP device. This option is set to **Enable** or **Disable**. This option is set to **Disable** by default.
VLAN ID	Shows the Vlan ID for the HTTP device
VLAN Priority	Shows the Vlan Priority for the HTTP device.
DHCP	Enables or disables DHCP for this HTTP device. This option is set to **Enable** by default.
IP Address	Specifies IP address for the HTTP device.
Subnet Mask	Specifies subnet mask for the HTTP device.
Gateway	Specifies gateway for the HTTP device.
DNS info via DHCP	Enables or disables DNS Information from DHCP. This option is set to **Enable** by default.
Primary DNS	Specifies the primary DNS server IP address for the HTTP Device.
Secondary DNS	Specifies the secondary DNS server IP address for the HTTP Device.
URI	Will obtain URI from the DHCP server if not specified
TLS Authentication Configuration	Specifies the option for TLS authentication configuration.

Table 59. 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 60. UEFI iSCSI Settings screen details

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

Table 61. 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 62. 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 63. 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.

Table 63. NVMe-oF SubSystem n Settings (continued)

Option	Description
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 64. Integrated Devices details

Option	Description
User Accessible USB Ports	Configures the user accessible USB ports. Selecting **Only Back Ports On** disables the front USB ports; selecting **All Ports Off** disables all front and back USB ports. ; 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 users without resetting the system. This option is set to **All Ports On** by default. ⓘ **NOTE:** Front Accessed configuration does not have the All Ports Off (Dynamic) function.
	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.
Embedded NIC1, NIC2, NIC3 and NIC4	Enables or disables the Embedded NIC1, NIC2, NIC 3, and NIC 4. If set to **Disabled (OS)**, the NIC may still be available for shared network access by the embedded management controller. This option is set to **Enabled** by default.
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

Table 64. Integrated Devices details (continued)

Option	Description
	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 option available is **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.
IIO PCIe Data Link Feature Exchange	This option allows globally disabling PCIe Data Link Feature Exchange. This may be needed to support certain legacy hardware. This option is set to **Enabled** by default.
Slot Disablement	Controls the of PCIe cards installed in the specified slot. Only the slots that are present on the system will be available for control.
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**. ⓘ **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 Communication option uses the Micro USB Type B port connection on the XR5610 system.

Table 65. 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.

Table 65. Serial Communication details (continued)

Option	Description
	The options available for System are **On without Console Redirection**, **On with Console Redirection via COM1**, **On with Console Redirection via COM2** **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 **Serial Device1=COM2**, **Serial Device2=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. ⓘ **NOTE:** Only Serial Device 2 can be used for Serial Over LAN (SOL). To use console redirection by SOL, configure the same port address for console redirection and the serial device. ⓘ **NOTE:** Every time the system boots, the BIOS syncs the serial MUX setting saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS 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 66. 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 **Performance**, **Performance Per Watt (OS)**, **Workstationi Performance** and **Custom**. ⓘ **NOTE:** All the parameters on the system profile setting screen are available only when the **System Profile** option is set to **Custom**.
Optimized Power Mode	When set to **Enabled**, processor is tuned for lower power consumption. Also sets C1E to Enabled, sets CPU Power Management of System DBPM mode, sets Energy Efficient Policy

Table 66. System Profile Settings details (continued)

Option	Description
	to Performance, sets Uncore Frequency to Dynamic, and sets Dynamic Load Line Switch to Enabled.
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. 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, this option is set to **1x** by default.
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.
Dynamic Load Line Switch	Dynamic Load Line (DLL) is a Power Management feature, which dynamically switches to the performance mode during periods of high CPU utilization. This setting is read-only and set to Enabled when Optimized Power Mode is Enabled.
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. (i) **NOTE:** This option can be disabled only if the C States option in the Custom mode is set to disabled. (i) **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. Below is the list of available profiles: ● Not Configured ● HPC Profile ● Low Latency Optimized Profile ● Virtualization Optimized Performance Profile ● Virtualization Optimized Performance Per Watt Profile ● DataBase Optimized Performance Profile ● Database Optimized Performance Per Watt Profile ● SDS Optimized Performance Profile ● SDS Optimized Performance Per Watt Profile ● Telco Optimized Profile

Table 66. System Profile Settings details (continued)

Option	Description
	● NFVIFP Optimized Turbo Profile ● NFVIFP Energy-Balance Turbo Profile
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.
Workload Configuration	This option controls Energy Performance Bias settings to allow BIOS to choose a configuration that improve performance on certain workload. Read-only unless System Profile is set to **Custom**.
OS ACPI Cx	Enables you to set the OS SCPI Cx to C2 or C3 state.

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 67. 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.
Strong Password Status	If enabled, you must set up a password that has at least one character in lowercase, uppercase, digit, and a special character. Also you have the option to set the minimum number of characters in both new passwords. If disabled, you can set a password that has any character in it but the password must not have more than 32 characters. Changes made by enabling or disabling this feature become immediately effective.
Strong Password Status Minimum Length (8-32)	Controls the minimum number of characters used when setting a system or setup password. You can specify 8-32 characters.
System Password	Sets the system password. This option 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 68. 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.
TPM Information	Indicates the type of Trusted Platform Module, if present.
TPM Firmware	Indicates the firmware version of the TPM.

Table 68. TPM 2.0 security information (continued)

Option	Description
TPM Hierarchy	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 69. 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 TME-MT 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.
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 completes cryptographic verification of BIOS to ensure platform security. Host power on will be delayed by a few minutes after AC power is 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.
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.

Table 69. System Security details (continued)

Option	Description
	ⓘ **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 Mitigation	Enables or disables the UEFI SMM security mitigation 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.
	User Mode — In **User Mode**, PK must be installed, and BIOS performs signature verification on programmatic attempts to update policy objects. The BIOS allows unauthenticated programmatic transitions between modes.
	Audit mode — 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.
	Deployed Mode — **Deployed Mode** is the most secure mode. In **Deployed Mode**, PK must be installed and the BIOS performs signature verification on programmatic attempts to update policy objects. **Deployed Mode** restricts the programmatic mode transitions.
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 System board jumper settings section.

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

Steps

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

3. On the **System Security** screen, verify that **Password Status** is set to **Unlocked**.
4. In the **System Password** field, type your system password, and press Enter or Tab.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.

   A message prompts you to reenter the system password.
5. Reenter the system password, and click **OK**.
6. In the **Setup Password** field, type your setup password and press Enter or Tab.
   A message prompts you to reenter the setup password.
7. Reenter the setup password, and click **OK**.
8. Press Esc to return to the System BIOS screen. Press Esc again.
   A message prompts you to save the changes.
   (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 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 exit and reboot. Settings are auto saved when system restarts.
7. Select **Setup Password**, change, or delete the existing setup password and press Enter or Tab.
   (i) **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 70. Redundant OS Control details

Option	Description
Redundant OS Location	Enables you to select a backup disk from the following devices: - None - SATA Ports in AHCI mode - 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 71. 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	Time's offset from UTC.
Daylight Savings Time	Enables or disables Daylight Savings Time.
Asset Tag	Specifies the asset tag and enables you to modify it for security and tracking purposes.

Table 71. Miscellaneous Settings details (continued)

Option	Description
Keyboard NumLock	Enables you to set whether the system boots with the NumLock enabled or disabled. This option is set to **On** by default. ⓘ **NOTE:** This option does not apply to 84-key keyboards.
F1/F2 Prompt on Error	Enables or disables the F1/F2 prompt on error. This option is set to **Enabled** by default. The F1/F2 prompt also includes keyboard errors.
Load Legacy Video Option ROM	Enables you to let the system BIOS determine whether it will load legacy video (INT 10h) option ROM from the video controller, in UEFI Boot Mode. This option is set to **disabled** by default
Dell Wyse P25/P45 BIOS Access	Enables or disables the Dell Wyse P25/P45 BIOS Access. This option is set to **Enabled** by default.
Power Cycle Request	Enables or disables the Power Cycle Request. This option is set to **None** by default.

iDRAC Settings

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.

Service Tag Settings

Service Tag Settings enables you to configure the System Service Tag.

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 72. 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 listed blow is the minimum configuration to POST:

- System board
- Power button control panel and cable
- Power Interposer Board (PIB) and cables
- Processor and heat sink
- One memory module (DIMM) in socket A1
- One power supply unit

ⓘ **NOTE:** The system may generate errors when it is in a minimum to POST configuration. This behavior is expected as the configuration is not validated for operational use, instead, only for troubleshooting or diagnostic purposes.

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 (adapter 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 73. 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 73. 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.	

Error messages

This section describes the error messages displayed on the screen during POST or captured in the system event log (SEL)/ LifeCycle (LC) log.

Table 74. Error message HWC8010

Error code	HWC8010
Message	The System Configuration Check operation resulted in the following issue involving the indicated component type
Arguments	Riser, floating card (fPERC, adapter PERC, BOSS), backplane, processor, cable, or other components
Detailed Description	The issue identified in the message is observed in the System Configuration Check operation.
Recommended Response Action	Do the following and retry the operation: 1. Disconnect the input power. 2. Check for proper cable connection and component placement. If the issue persists, contact the service provider.
Category	System Health (HWC = Hardware Config)
Severity	Critical
Trap/EventID	2329

Table 75. Error message HWC8011

Error code	HWC8011
Message	The System Configuration Check operation resulted in multiple issues involving the indicated component type
Arguments	Riser, floating card (fPERC, adapter PERC, BOSS), backplane, processor, cable, or other components
Detailed Description	Multiple issues are observed in the System Configuration Check operation.
Recommended Response Action	Do the following and retry the operation: 1. Disconnect the input power. 2. Check for proper cable connection and component placement. If the issue persists, contact the service provider.
Category	System Health (HWC = Hardware Config)
Severity	Critical

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

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:
- Phillips 1 screwdriver
- Phillips 2 screwdriver
- Torx T30 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
   ⓘ **NOTE:** Use alpha wire part number 3080 or equivalent (65/30 stranding).

(i) **NOTE:** For information about DC PSU cabling instructions, go to https://www.dell.com/poweredgemanuals > **XR Servers** > PowerEdge XR5610 > **Select This Product** > **Documentation** > **Manuals and Documents** > *Cabling instructions for – 48 – 60 V DC power supply*.

Front bezel

Removing the front bezel

Prerequisites

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

Steps

Press the two side buttons to release the bezel.
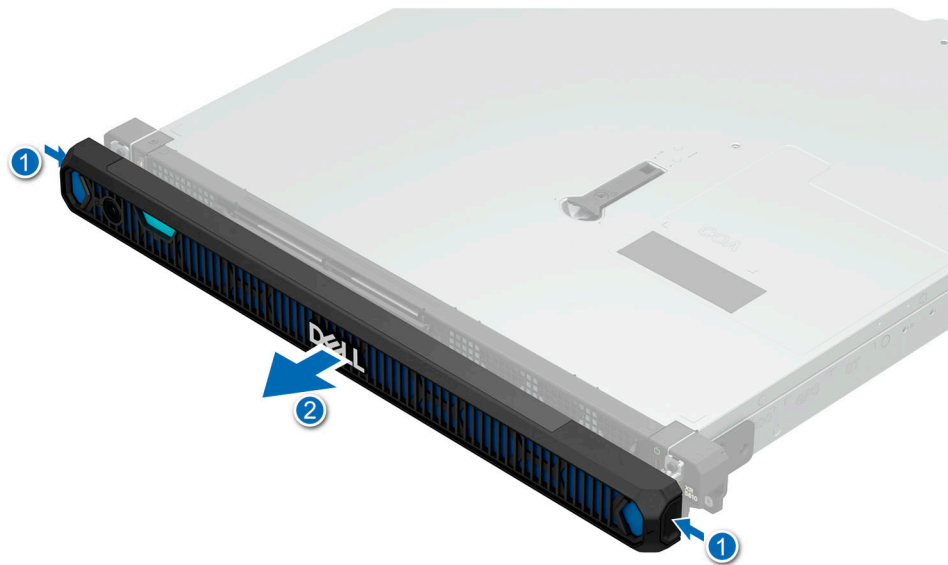
Figure 29. Removing the front bezel for Rear Accessed configuration
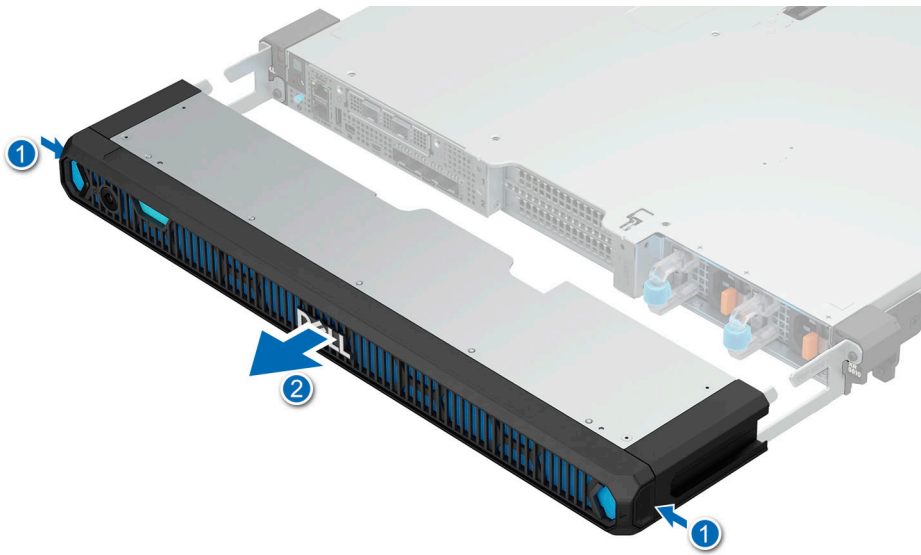
Figure 30. Removing the front bezel for Front Accessed configuration

Next steps

Replace the front bezel.

Installing the front bezel

Prerequisites

Follow the safety guidelines listed in the Safety instructions.

Locate and remove the bezel key.

(i) **NOTE:** Press both side buttons to release the two metal clips from the back of the front bezel before installation.

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

Steps

1. Align the metal clips with the left and right ears of the system. Using a Philips 2 screwdriver, tighten the 4 screws to secure the metal clips.
2. Align the front bezel with the metal clips and push the front bezel until it clicks on to the metal clips.
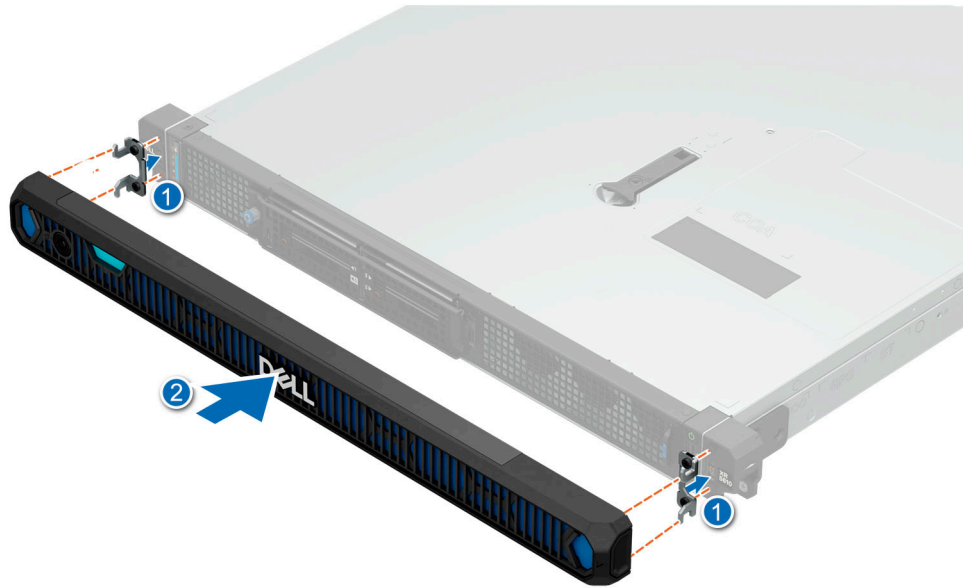
Figure 31. Installing the front bezel for Rear Accessed configuration
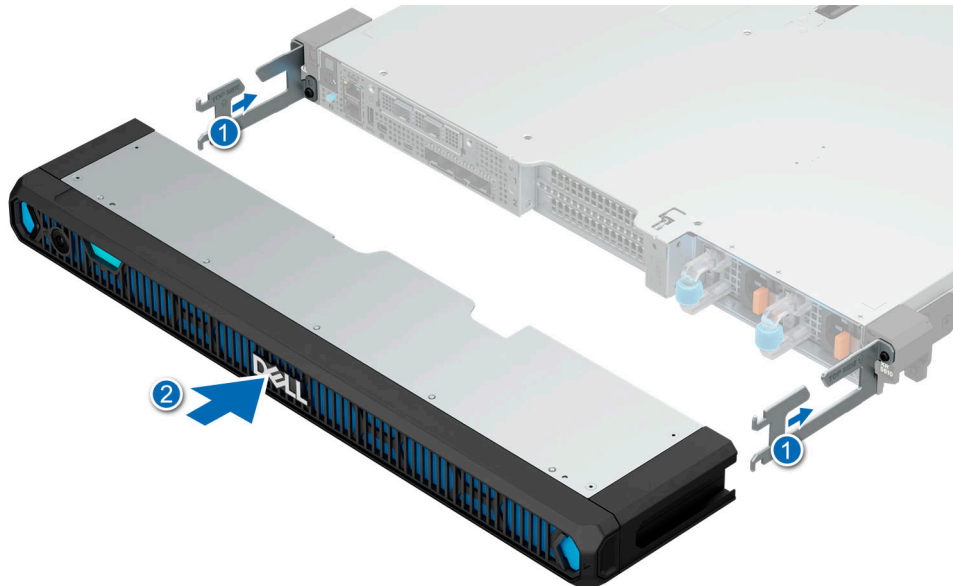
Figure 32. Installing the front bezel for Front Accessed configuration

Bezel filter

Bezel filter service guide

Cleaning air filters is not recommended by major telecommunication carriers and service providers, the governing NEBS Standards have stated air filters should be replaced. NEBS GR-63-CORE, Section 4.1.5.2 Fan-Cooled Equipment Criteria, Requirement R4-27, states the following:

"Equipment fan filters shall be single use and not the types that require cleaning."

General guidelines

Based on network equipment environmental criteria, telecommunications industry standards, thermal management concerns, and fiscal assessments, it is recommended air filters are to be replaced every three to six months, or within the recommended preventive maintenance schedule.

Storing air filters for more than 6 months is not recommended. Instead, purchase cost-effective quantities and keep sufficient inventories based on your replacement cycle. Telecom air filters have improved permanence (service life) in an operating situation with air movement and ventilation.

(i) **NOTE:** To maintain optimal system health, Dell Technologies recommends checking and changing the filter every three months. Filters can be ordered from Dell.

Removing the bezel filter for Rear Accessed configuration

Prerequisites

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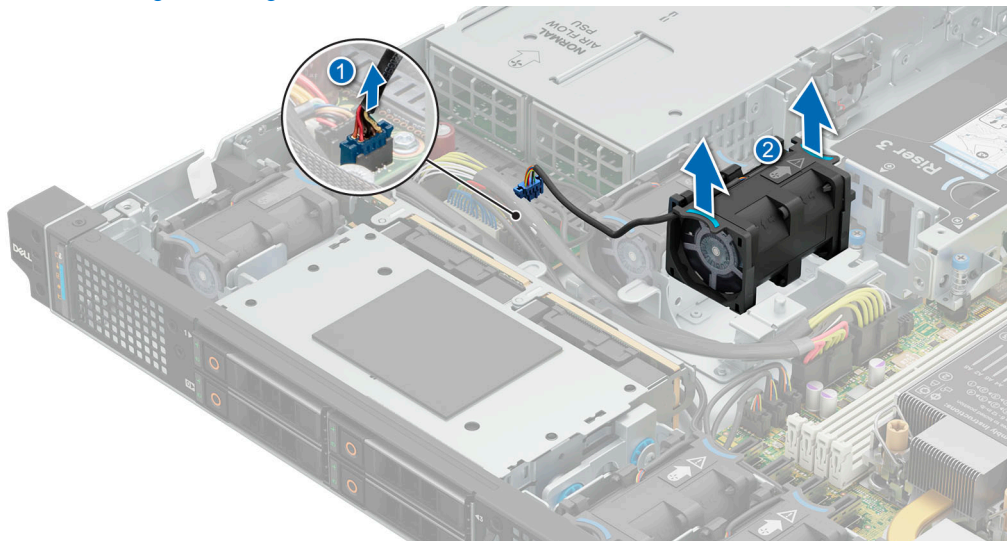2. Follow the procedure listed in the Before working inside your system.
3. Remove the front bezel.

(i) **NOTE:** The procedure to remove the bezel filter is the same for Rear Accessed and Front Accessed configurations.

Steps

Lift the bezel grill from both corners and remove the filter out from the hooks.
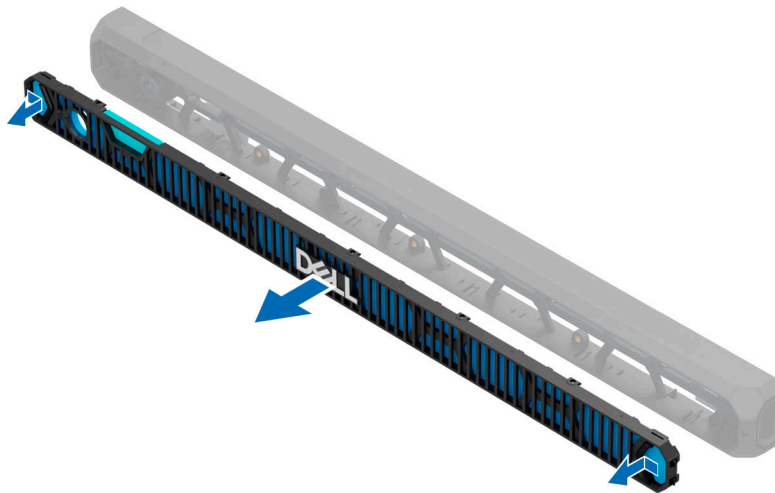
Figure 33. Removing the front bezel filter

(i) **NOTE:** To maintain optimal system health, Dell Technologies recommends checking and changing the filter every three months. Filters can be ordered from Dell.

Next steps

Replace the bezel filter.

Installing the bezel filter for Rear Accessed configuration

Prerequisites

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

ⓘ **NOTE:** The procedure to install the bezel filter is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Place the new filter in the bezel cavity under the bezel grill. Ensure that the filter is properly placed in the hooks of the bezel cavity.
2. Align the bezel grill with bezel and press the grill on the securing brackets location to secure it in place.
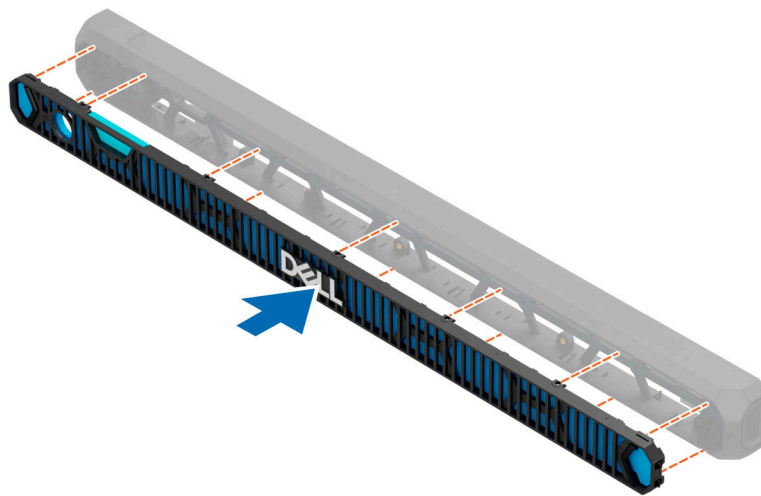
Figure 34. Installing the front bezel filter

Next steps

Install the front bezel.

System cover

Removing 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.

Steps

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

   ⓘ **NOTE:** The release latch must be fully lifted for the system cover to be released.

3. Lift the cover from the system.

Figure 35. Removing the system cover for Rear Accessed configuration
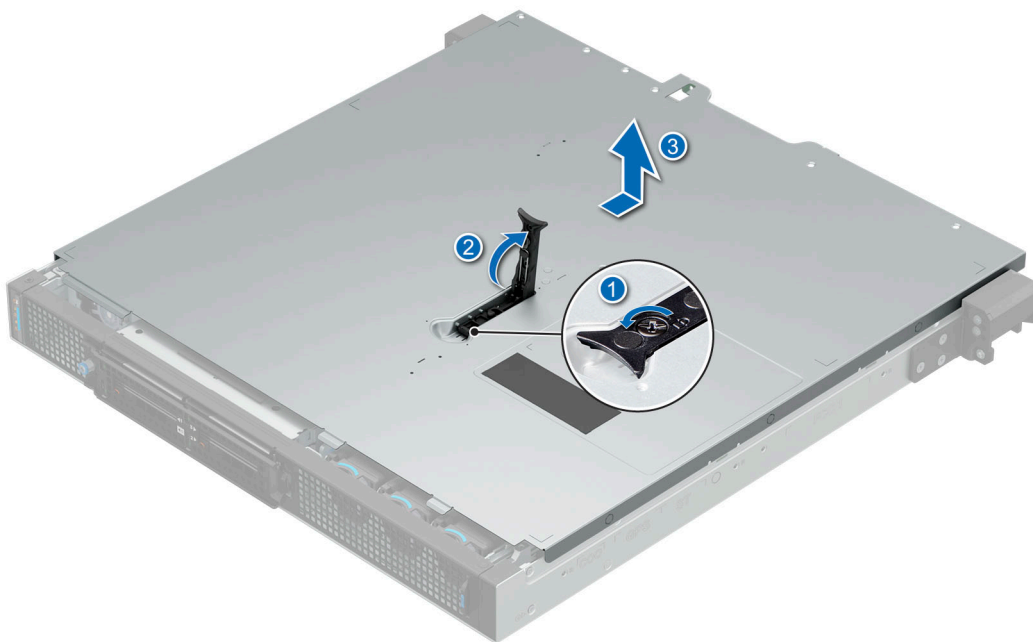
Figure 36. Removing the system cover for Front Accessed configuration

Next steps

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

Figure 37. Installing the system cover for Rear Accessed configuration

Figure 38. Installing the system cover for Front Accessed configuration

Next steps

Follow the procedure listed in After working inside your system.

Air shroud

Removing the air shrouds

The system supports PCI air shroud and processor 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 .

ⓘ **NOTE:** The procedure to remove the air shrouds is the same for Rear Accessed and Front Accessed configurations.

Steps

Holding the air shroud at both the ends, lift the air shroud out of the system.
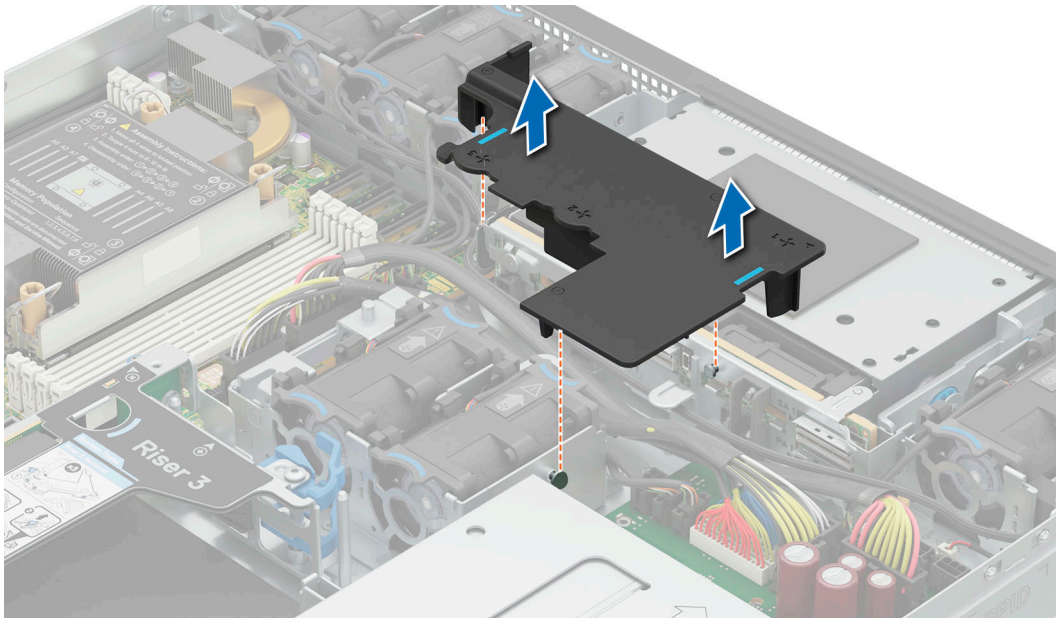
Figure 39. Removing the PCI air shroud
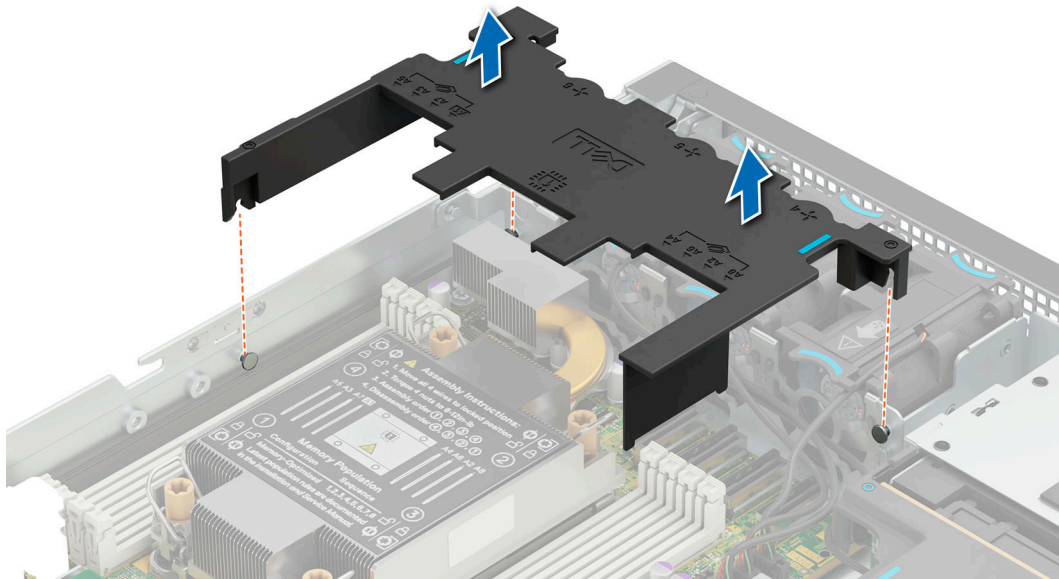
Figure 40. Removing the processor air shroud

Next steps

Replace the air shroud.

Installing the air shrouds

The system supports PCI air shroud and processor 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 .

ⓘ **NOTE:** The procedure to install the air shrouds is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Align the guide pins on the system with guides on the air shroud.
2. Lower the air shroud into the system until it is firmly seated.

ⓘ **NOTE:** Ensure that the air shroud and cables do not interfere with each other.
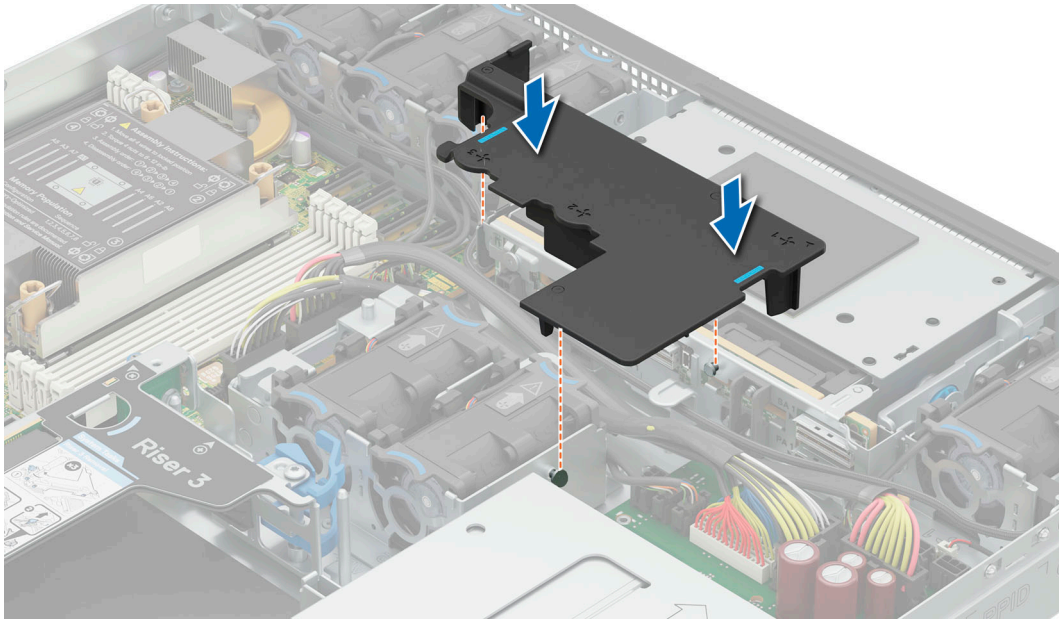
Figure 41. Installing the PCI air shroud
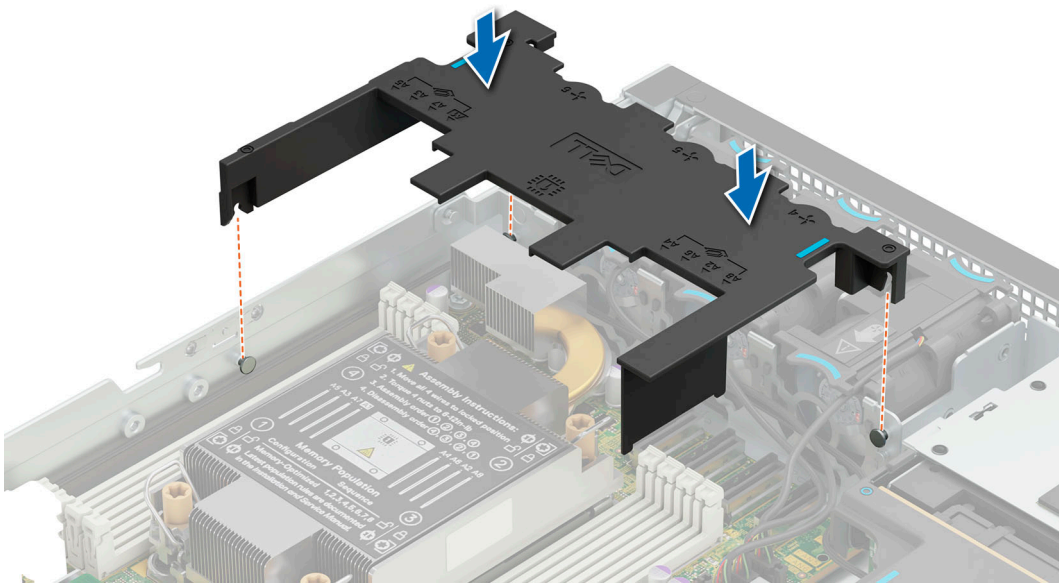
Figure 42. Installing the processor air shroud

Next steps

Follow the procedure listed in After working inside your system.

Cooling fans

Removing the 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. If installed, remove the air shrouds.

ⓘ **NOTE:** The procedure to remove the cooling fan is the same for Rear Accessed and Front Accessed configurations.

ⓘ **NOTE:** Observe the fan cable routing or make a note on the fan cable routing.

Steps

1. Disconnect the cooling fan cable that is connected to the system board connector.
2. Holding the blue tabs, lift the cooling fan out of the fan cage.

Figure 43. Removing a cooling

fan

Next steps

Replace the cooling fan.

Installing the 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 .

ⓘ **NOTE:** The procedure to install the cooling fan is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Lower the cooling fan into the cage until it is seated firmly.
2. Route the cable properly to prevent the cable from being pinched or crimped.
3. Press the release tabs on the fan cable connector and connect the cable to the system board.

> (i) **NOTE:** Ensure to connect the fan cable to the correct fan connector on the system board. Check the SIL label for the correct fan header location.
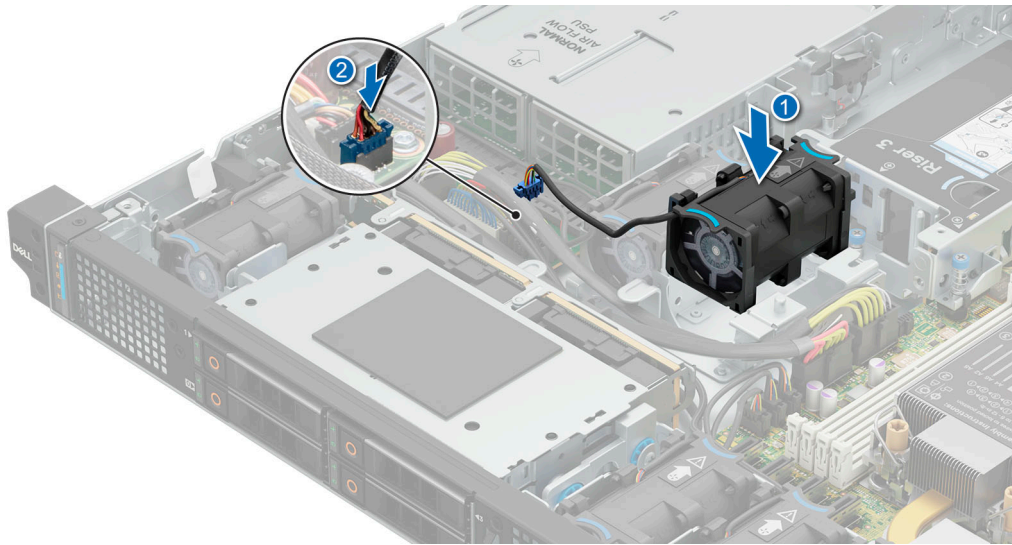
Figure 44. Installing a cooling fan

Next steps

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

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. If installed, remove the air shroud.

Steps

1. Remove the power cable from the power interposer board (PIB) and the system board. Then disconnect and remove the intrusion switch cable from the connector on the system board.

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

2. Using the Phillips 1 screwdriver, remove the screw securing the intrusion switch module.
3. Lift the intrusion switch module out of the system.
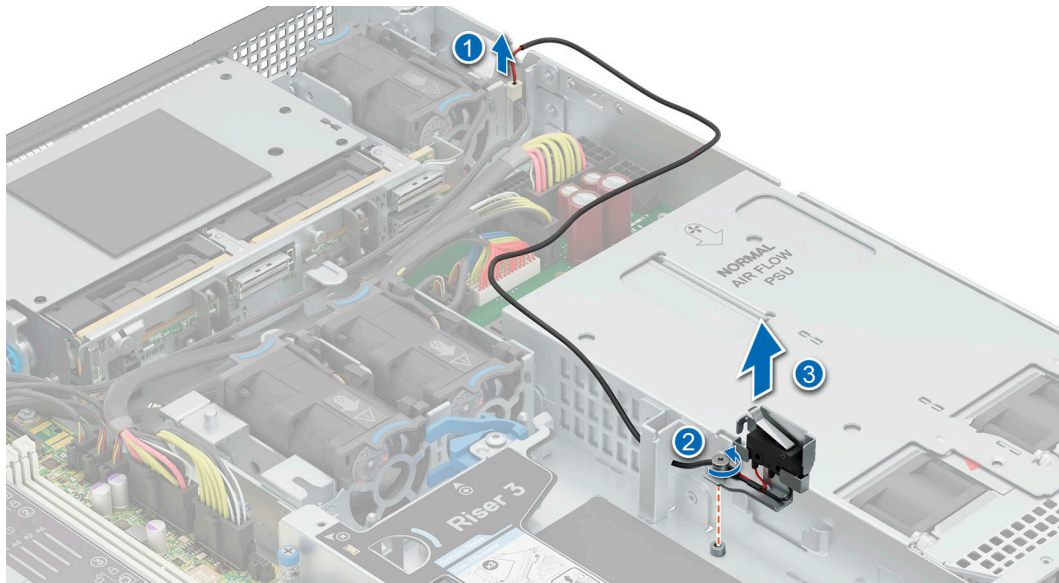
Figure 45. Removing the intrusion switch module

Next steps

Before working inside your system.

Installing the intrusion switch module

Prerequisites

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

   (i) **NOTE:** The procedure to install the intrusion switch module is the same for Rear Accessed and Front Accessed configurations.

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

Steps

1. Align and insert the intrusion switch module until it is firmly seated in the slot on the system.
2. Using the Phillips 1 screwdriver, tighten the screw securing the intrusion switch module.
3. Connect the intrusion switch cable to the connector on the power interposer board (PIB).
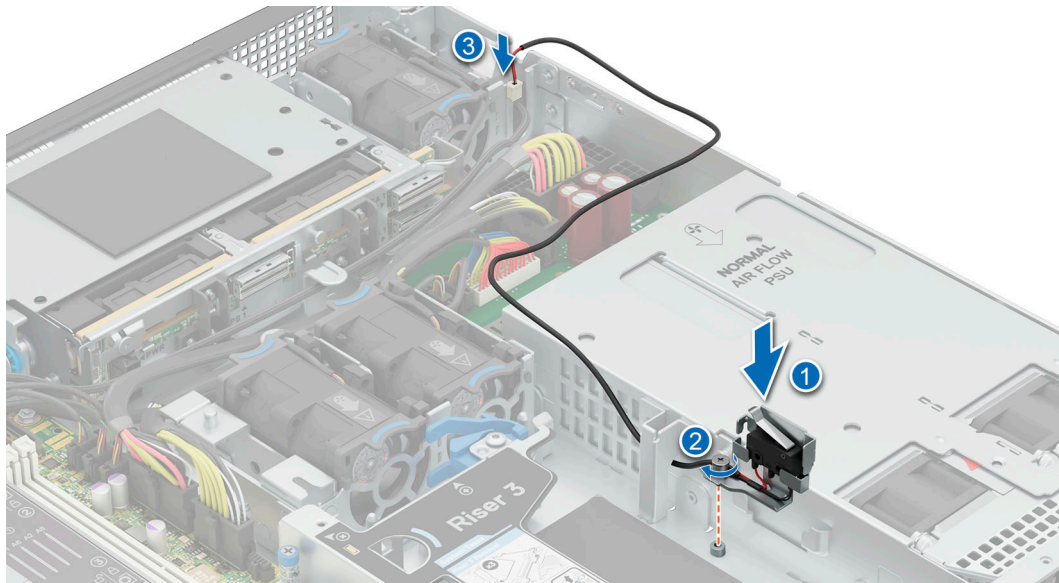
Figure 46. Installing the intrusion switch module

Next steps

1. Reconnect all the cables to the power interposer board (PIB).
2. 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. If installed, remove the front bezel.

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

ⓘ **NOTE:** The procedure to remove the drive blank is the same for Rear Accessed and Front Accessed configurations.

Steps

Press the release button, and slide the drive blank out of the drive slot.
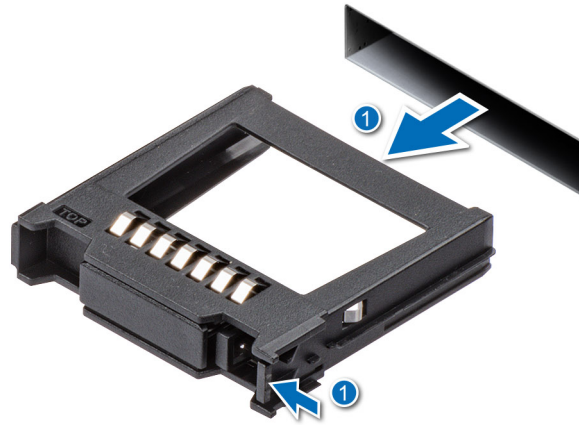
Figure 47. Removing a drive blank

Next steps

Replace the drive or replace the drive blank.

Installing the drive blank

Prerequisites

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

ⓘ **NOTE:** The procedure to install the drive blank is the same for Rear Accessed and Front Accessed configurations.

Steps

Insert the drive blank into the drive slot until the release button clicks into place.
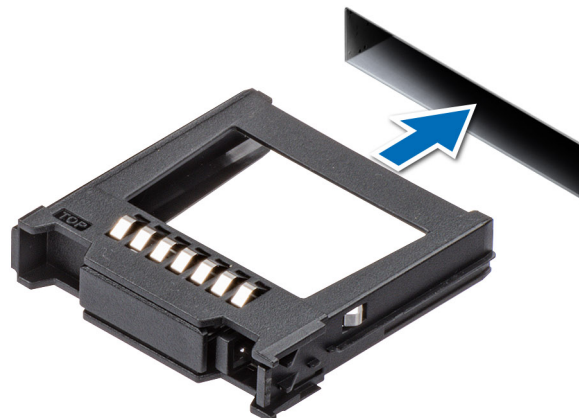
Figure 48. Installing a drive blank

Next steps

If removed, replace the front bezel.

Removing the drive carrier

Prerequisites

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

   If the drive is online, the green activity or fault indicator blinks while the drive is powering off. When the drive indicators are off, the drive is ready for removal. For more information, see the Storage controller documentation.https://www.dell.com/storagecontrollermanuals

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

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

Steps

1. Press the release button to open the drive carrier release handle.
2. Holding the drive carrier release handle, slide the drive carrier out of the drive slot.
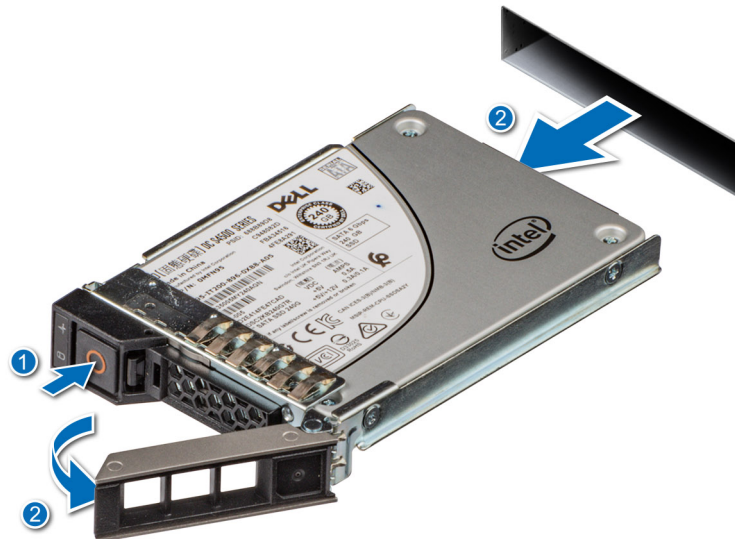
Figure 49. Removing a drive carrier

Next steps

Replace the drive carrier or drive blank.

Installing the drive carrier

Prerequisites

> ⚠ **CAUTION: Before removing or installing a drive while the system is running, see the documentation for the storage controller card to ensure that the host adapter is configured correctly to support drive removal and insertion.**

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

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

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

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

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

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

Steps

1. Slide the drive carrier into the drive slot.
2. Close the drive carrier release handle to lock the drive in place.
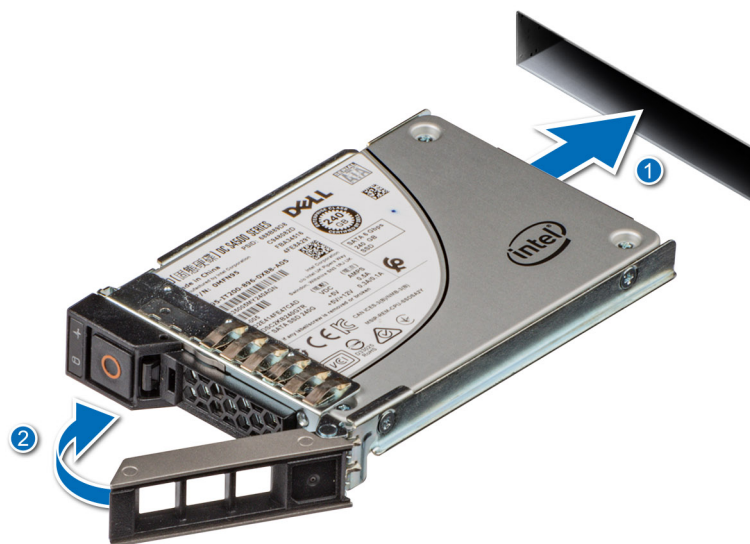
Figure 50. Installing a drive carrier

Next steps

If removed, install the front bezel.

Removing the drive from the drive carrier

Prerequisites

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

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).

2. Lift the drive out of the drive carrier.
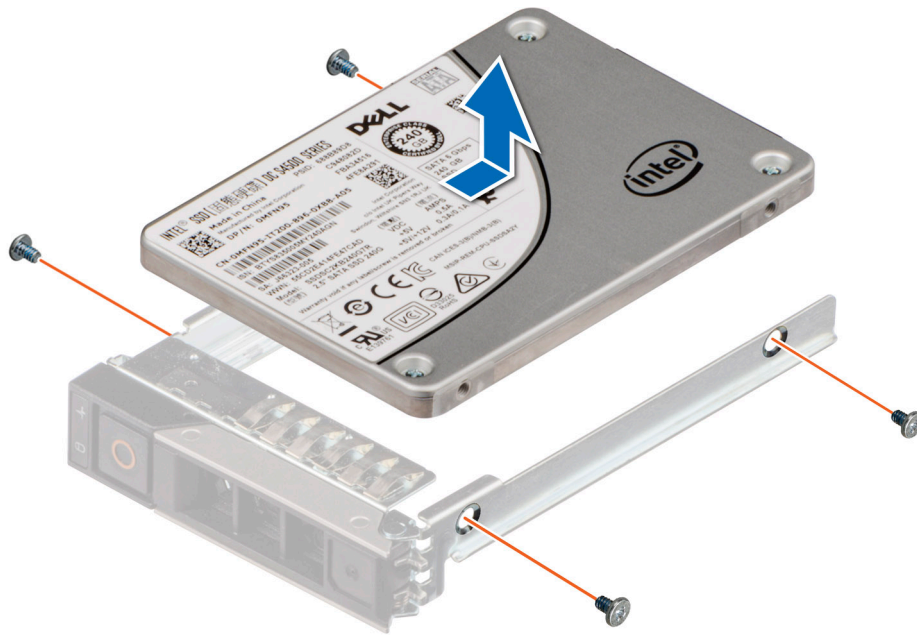
Figure 51. Removing the drive from the drive carrier

Next steps

Replace the drive into the drive carrier.

Installing the drive into the drive carrier

Prerequisites

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

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

Steps

1. Insert the drive into the drive carrier with the drive connector facing towards the rear of the carrier.
2. Align the screw holes on the drive with the screws holes on the drive carrier.
3. Using a Phillips 1 screwdriver, secure the drive to the drive carrier with the screws.

    ⓘ **NOTE:** If the drive carrier has Torx screw ✿, use Torx 6 (for 2.5-inch drive).
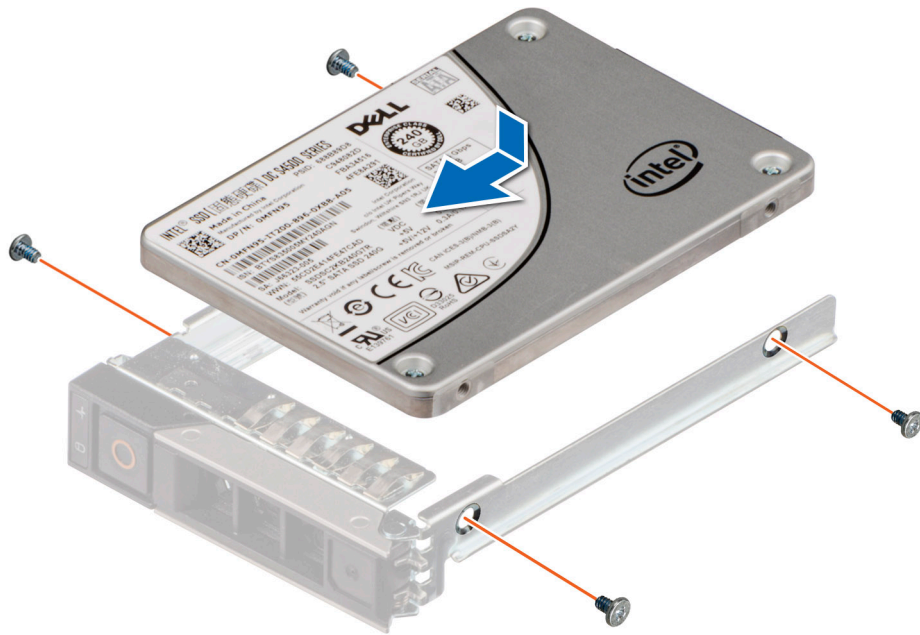
Figure 52. Installing a drive into the drive carrier

Next steps

1. Replace the drive carrier.

Drive backplane

This is a service technician replaceable part only.

Drive backplane
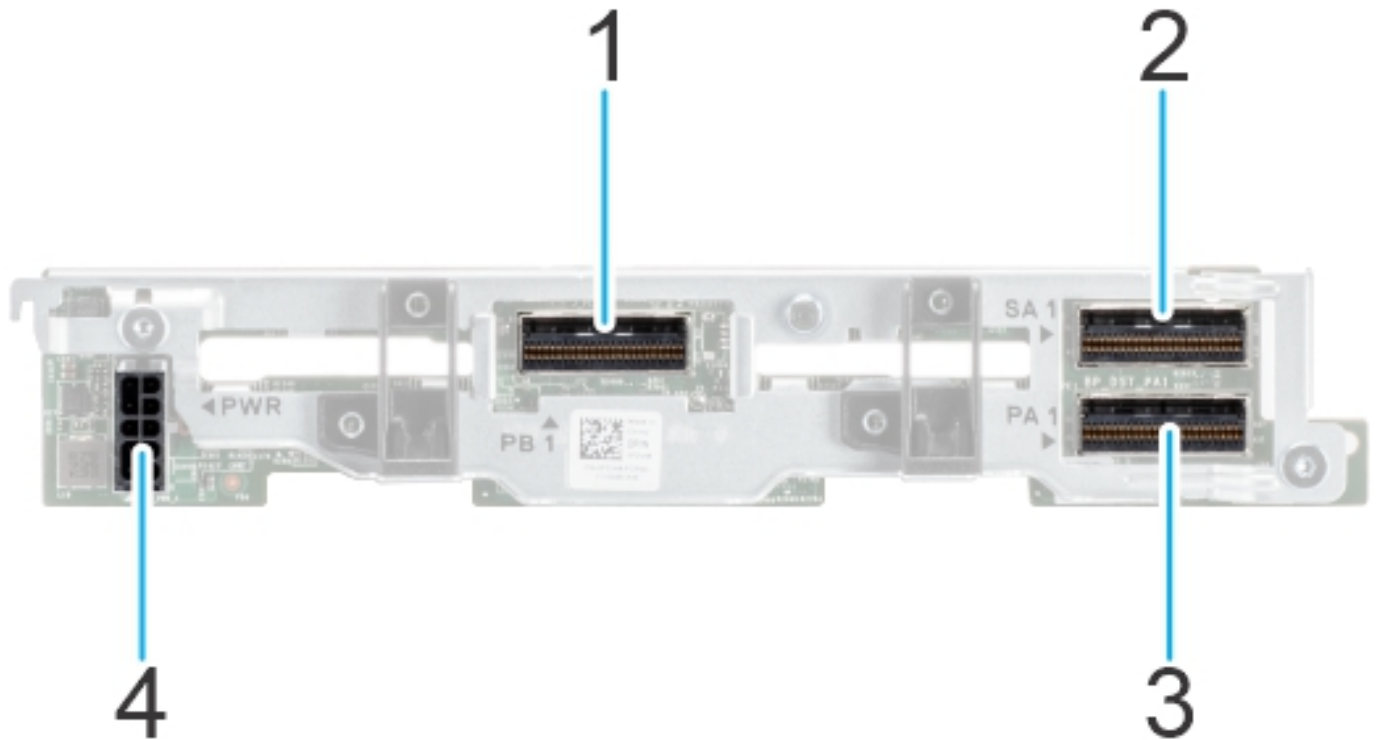
Figure 53. 4 x 2.5-inch universal backplane

1. PB1 (NVMe signal connector)
2. SA1 (SAS/SATA signal connector)
3. PA1 (NVMe signal connector)
4. PWR (backplane power cable connector)

Removing the drive backplane

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Remove all the drives.
4. Remove the PCI air shroud.
5. Disconnect the drive backplane cables from the connectors on backplane.

ⓘ **NOTE:** The procedure to remove the drive backplane is the same for Rear Accessed and Front Accessed configurations.

⚠ **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.**

Steps

1. Holding the drive backplane by the edges lift it upwards to disengage the backplane from the guide pins.
2. Lift the drive backplane out of the system.
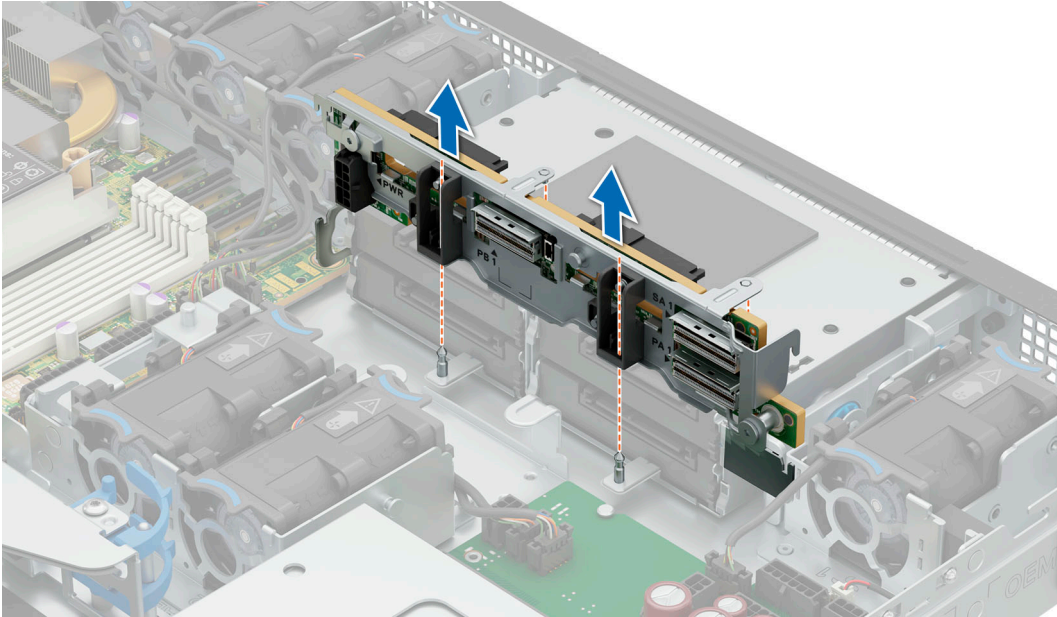
Figure 54. Removing the drive backplane

Next steps

Replace the drive backplane.

Installing the drive backplane

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the PCI air shroud.
4. Disconnect the drive backplane cables from the connectors on the system board.

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

ⓘ **NOTE:** The procedure to install the drive backplane is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Align the guide pins on the backplane with the guides on the system.
2. Insert the backplane into the guides and lower the backplane firmly until it is fully seated.
3. Verify that the backplane connector pins are not bent and then connect the cables to the backplane.
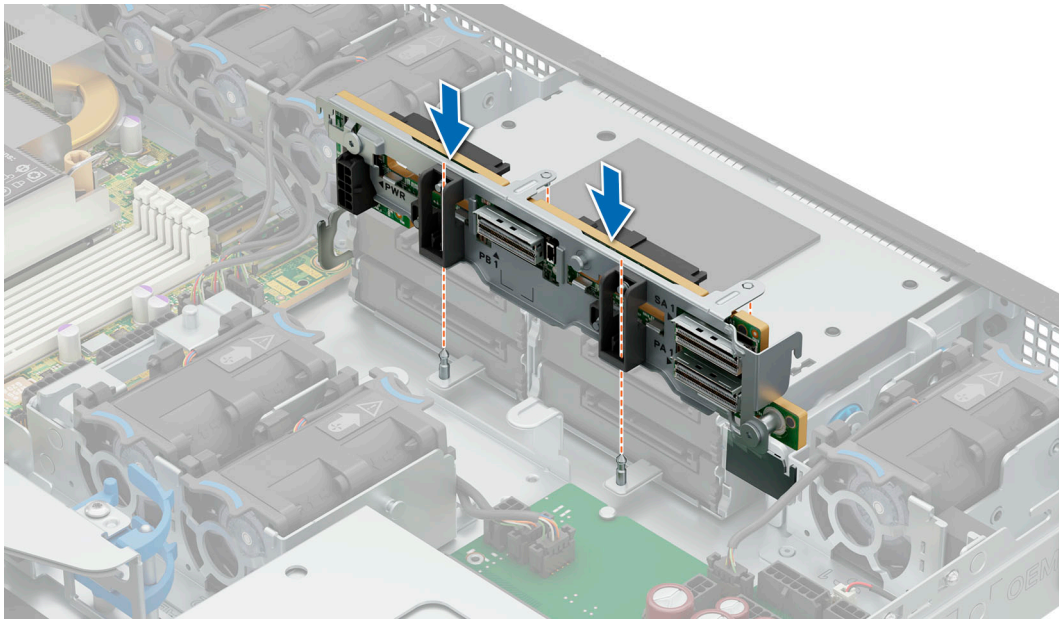
Figure 55. Installing the drive backplane

Next steps

1. Connect the cables to the backplane and then verify that both power and signal cable connections are fully seated to the backplane and system board.
2. Install all the drives.
3. Install the PCI air shroud.
4. Follow the procedure listed in After working inside your system.

Cable routing
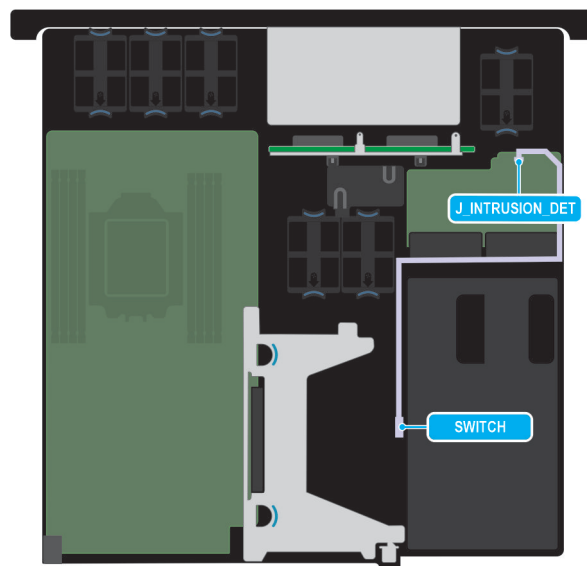
Figure 56. Intrusion cable from PIB to intrusion switch

Table 76. Intrusion cable from PIB to intrusion switch

From	To
J_INTRUSION_DET (PIB connector)	SWITCH (intrusion switch)
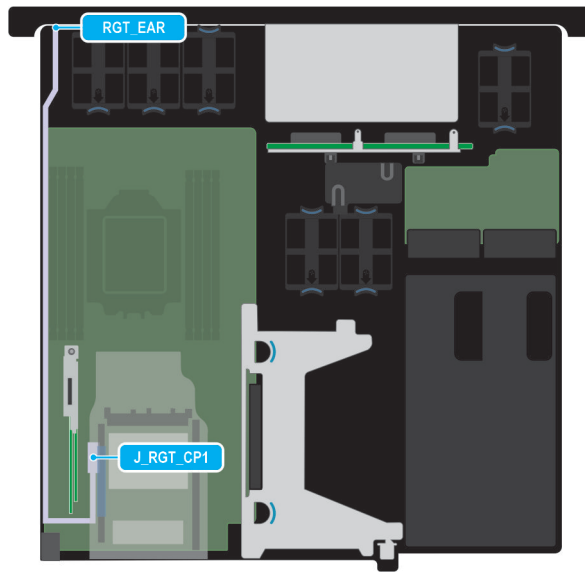
Figure 57. Right ear cable from MIO to right ear—Rear Accessed configuration

Table 77. Right ear cable from MIO to right ear - Rear Accessed configuration

From	To
J_RGT_CP1 (right ear connector on system board)	RGT_EAR (right ear control panel)
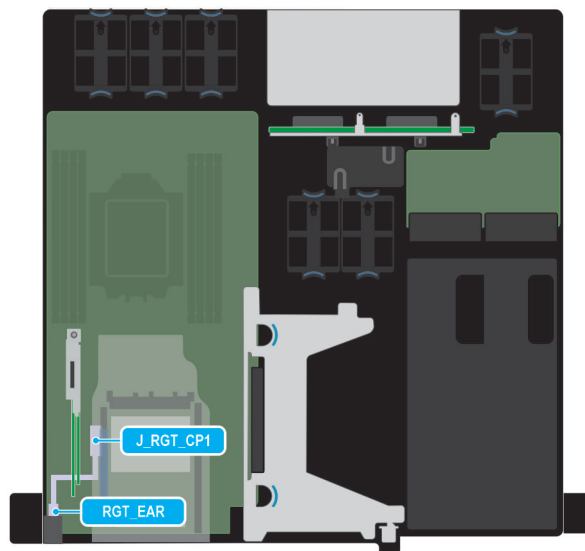
Figure 58. Right ear cable from MIO to right ear—Front Accessed configuration

Table 78. Right ear cable from MIO to right ear - Front Accessed configuration

From	To
J_RGT_CP1 (right ear connector on system board)	RGT_EAR (right ear control panel)
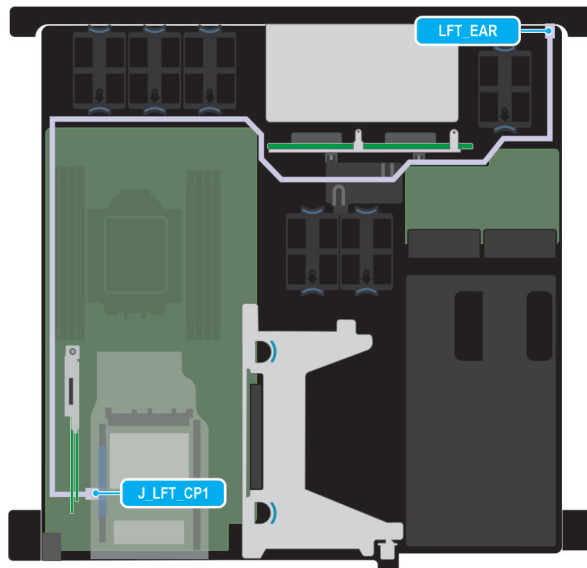
Figure 59. Left ear cable from MIO to left ear—Front and Rear Accessed configuration

Table 79. Right ear cable from MIO to right ear - Front and Rear Accessed configuration

From	To
J_LFT_CP1 (left ear connector on system board)	LFT_EAR (left ear control panel)
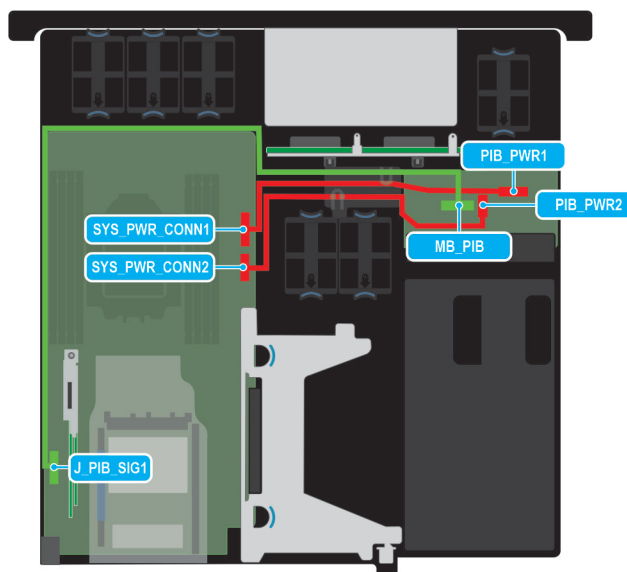
Figure 60. Power Interposer Board (PIB) connection to the system board

Table 80. Power Interposer Board (PIB) connection to the system board

From	To
MB_PIB (PIB signal connector)	J_PIB_SIG1 (system board connector)
PIB_PWR1 (PIB power connector)	SYS_PWR_CONN1 (system board connector)
PIB_PWR2 (PIB power connector)	SYS_PWR_CONN2 (system board connector)
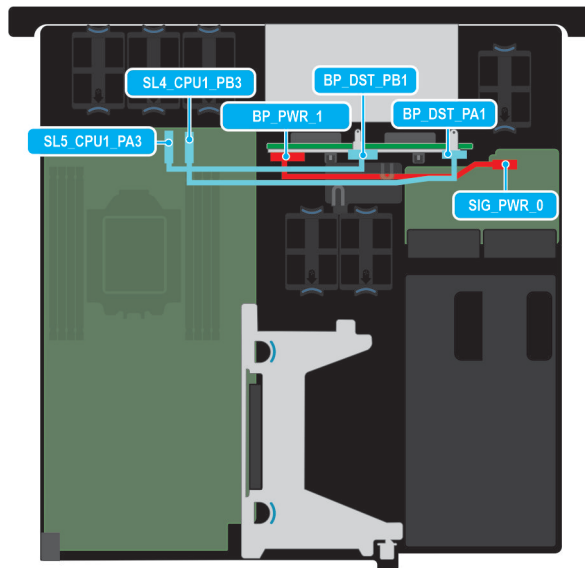
Figure 61. PIB to 4 drive backplane

Table 81. PIB to 4x 2.5-inch backplane

From	To
BP_PWR_1 (backplane power connector)	SIG_PWR_0 (PIB power connector)
BP_DST_PA1 (backplane signal connector)	SLA_CPU1_PB3 (signal connector, cable marking MB_PB3)
BP_DST_PB1 (backplane signal connector)	SLA_CPU1_PA3 (signal connector, cable marking MB_PA3)
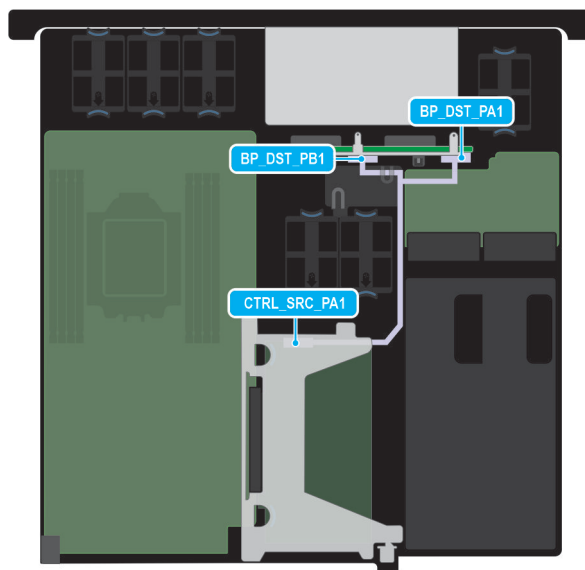
Figure 62. PERC PA NVMe cable with 4x 2.5-inch backplane

Table 82. PERC PA NVMe cable with 4x 2.5-inch backplane

From	To
CTRL_SRC_PA1 (PERC controller connector)	BP_DST_PA1 (backplane signal connector) and BP_DST_PB1 (backplane signal connector)
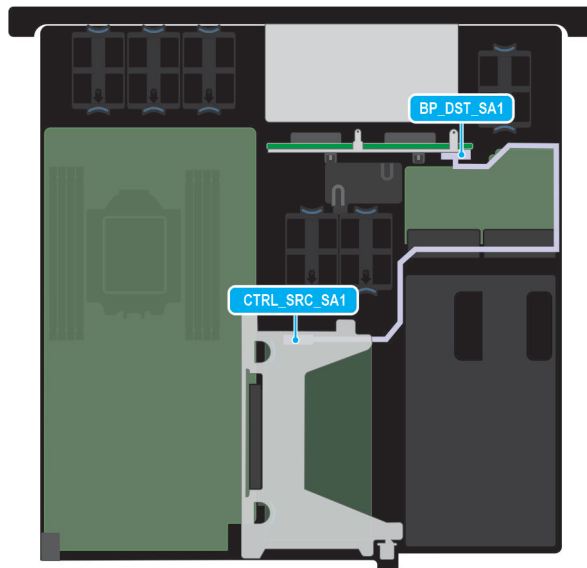
Figure 63. PERC SA SAS cable with 4x 2.5-inch backplane

Table 83. PERC SA SAS cable with 4x 2.5-inch backplane

From	To
CTRL_SRC_SA1 (PERC controller connector)	BP_DST_SA1 (backplane signal connector)
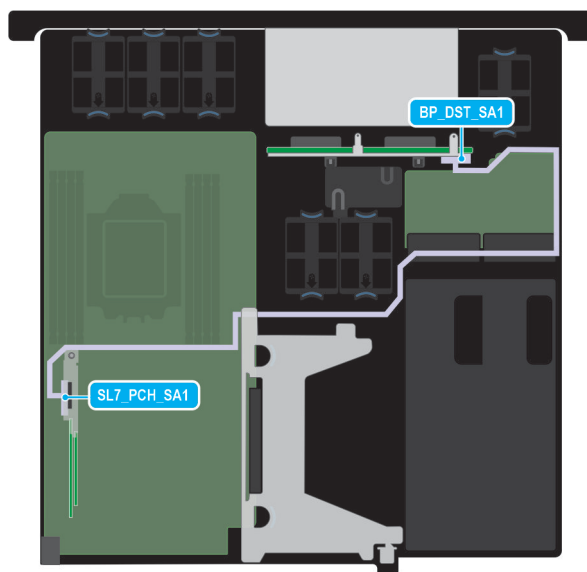
Figure 64. SATA cable connector with 4x 2.5-inch backplane

Table 84. SATA cable connector with 4x 2.5-inch backplane

From	To
SL7_PCH_SA1 (SATA system board connector)	BP_DST_SA1 (backplane signal connector)
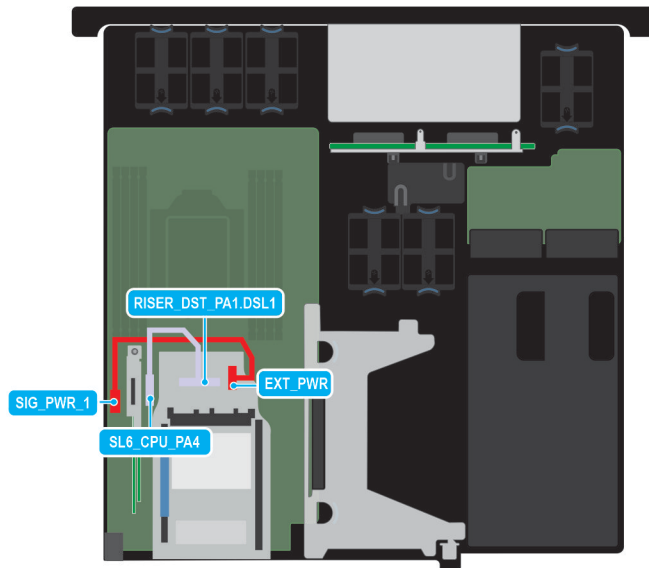
Figure 65. Riser 1 (floating riser) cable connection on system board

Table 85. Riser 1 (floating riser) cable connection on system board

From	To
EXT_PWR (riser 1 power connector)	SIG_PWR_1 (power connector on system board)
RISER_DST_PA1.DSL1 (riser 1 signal connector)	SL6_CPU_PA4 (signal connector on system board)
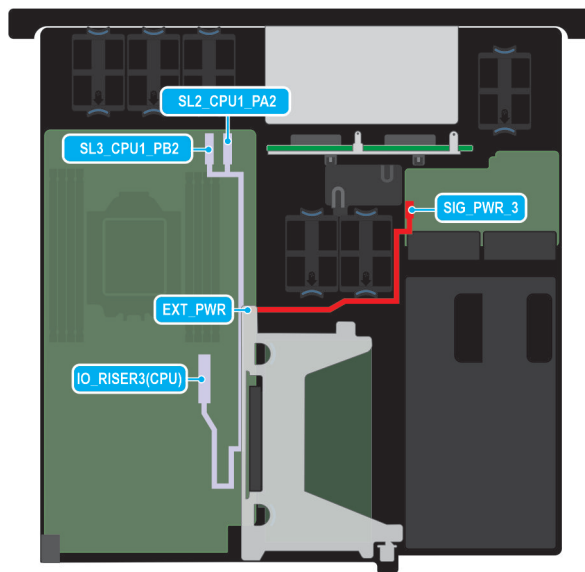
Figure 66. Riser 3 cable connection on system board and PIB

Table 86. Riser 3 cable connection on system board and PIB

From	To
EXT_PWR (riser 3 power connector)	SIG_PWR_3 (power connector on system board)
IO_RISER3(CPU) (riser 3 signal connector)	SL3_CPU1_PB2 (signal connector on system board) and SL3_CPU1_PA2 (signal connector on system board)
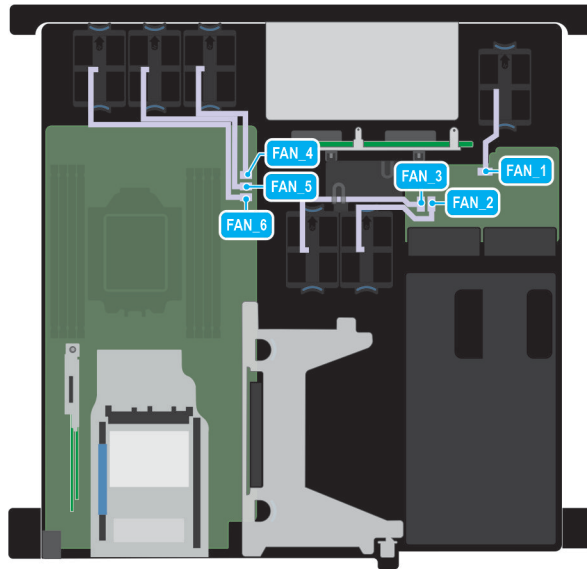
Figure 67. Fan cable connections to system board and PIB—Front Accessed configuration

Table 87. Fan cable connections to system board and PIB—Front Accessed configuration

From	To
FAN_1, FAN_2, and FAN_3	Power Interposer board connectors
FAN_4, FAN_5, and FAN_6	Connectors on the system board
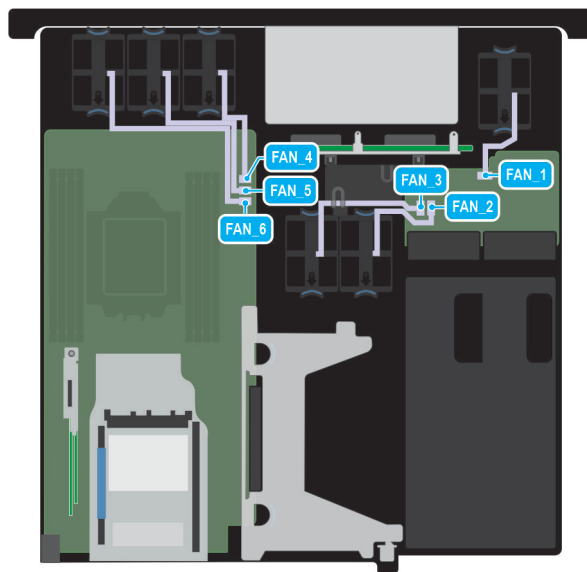
Figure 68. Fan cable connection to system board and PIB—Rear Accessed configuration

Table 88. Fan cable connections to system board and PIB—Rear Accessed configuration

From	To
FAN_1, FAN_2, and FAN_3	Power Interposer board power connectors
FAN_4, FAN_5, and FAN_6	Power connectors on the system board
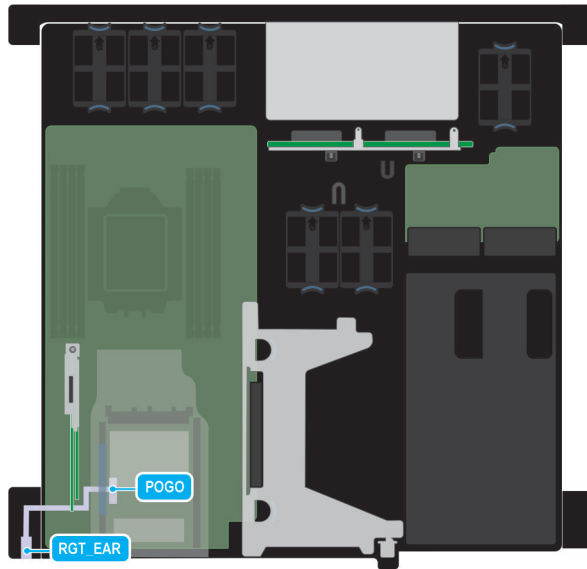
Figure 69. MIO cable connection to Right ear—Front Accessed configuration

Table 89. MIO cable connection to Right ear—Front Accessed configuration

From	To
POGO (pogo connector)	RGT_EAR (right ear control panel)
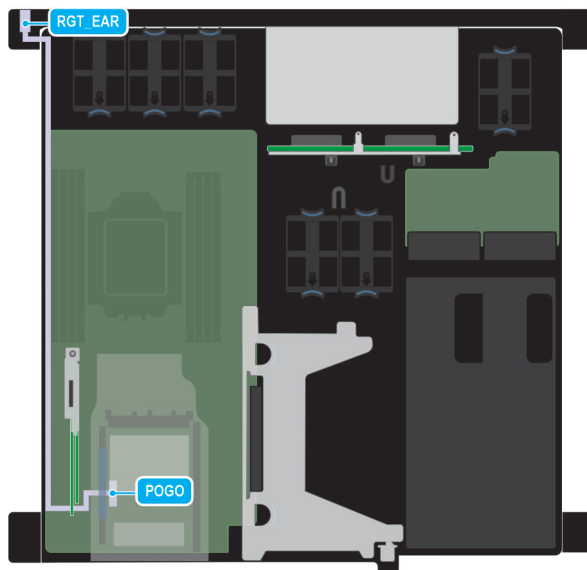
Figure 70. MIO cable connection to Right ear—Rear Accessed configuration

Table 90. MIO cable connection to Right ear—Rear Accessed configuration

From	To
POGO (pogo connector)	RGT_EAR (right ear control panel)
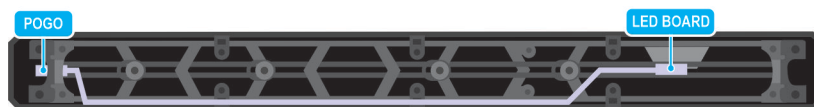
Figure 71. Pogo pin cable connection to bezel LED—Rear Accessed configuration

Table 91. Pogo pin cable connection to bezel LED—Rear Accessed configuration

From	To
POGO (pogo pin connector)	LED BOARD (bezel LED connector)
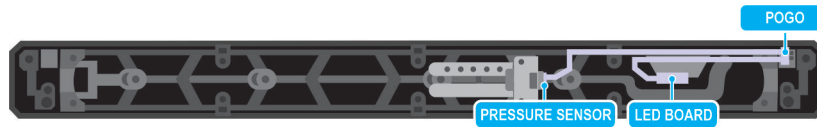
Figure 72. Pogo pin cable connection to bezel LED and pressure sensor—Front Accessed configuration

Table 92. Pogo pin cable connection to bezel LED—Front Accessed configuration

From	To
POGO (pogo pin connector)	LED BOARD (bezel LED connector) and PRESSURE SENSOR (pressure sensor connector)
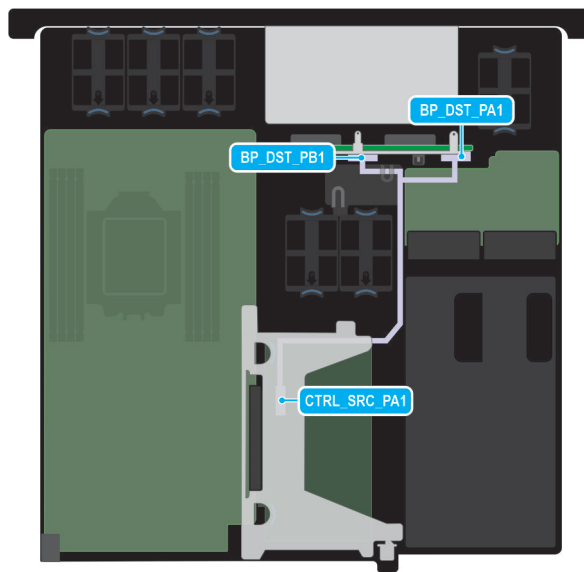
Figure 73. PERC H965 PA1 NVMe cable connection with 4x 2.5-inch backplane

Table 93. PERC H965 PA1 NVMe cable connection with 4x 2.5-inch backplane

From	To
CTRL_SRC_PA1 (PERC connector)	BP_DST_PB1 (backplane signal connector) and BP_DST_PA1 (backplane signal connector)
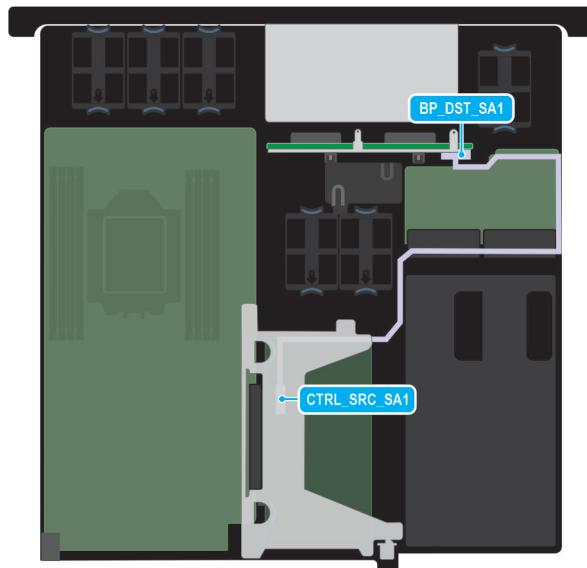
Figure 74. PERC H965 SA1 SAS/SATA cable connection to 4x 2.5-inch backplane

Table 94. PERC H965 SA1 SAS/SATA cable connection to 4x 2.5-inch backplane

From	To
CTRL_SRC_PA1 (PERC connector)	BP_DST_SA1 (backplane signal connector)
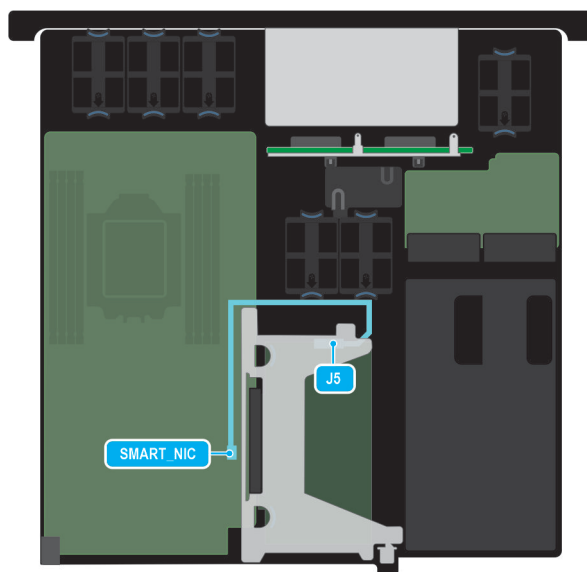
Figure 75. Smart NIC cable connection to MIO

Table 95. Smart NIC cable connection to MIO

From	To
J5 (Smart NIC connector)	SMART_NIC (smart NIC connector on system board)

System memory

System memory guidelines

The PowerEdge XR5610 system supports DDR5 registered DIMMs (RDIMMs).

Your system memory is organized into eight channels per processor.

Figure 76. Memory channels

Memory channels are organized as follows:

Table 96. Memory channels

Processor	Channel A	Channel B	Channel C	Channel D	Channel E	Channel F	Channel G	Channel H
Processor 1	A1	A7	A3	A5	A4	A6	A2	A8

Table 97. Supported memory matrix

DIMM type	Rank	Capacity	DIMM rated voltage and speed	Operating Speed 1 DIMM per channel (DPC)
RDIMM	1 R	16 GB	DDR5 (1.1 V), 4800 MT/s	4400 MT/s
	2 R	32 GB, 64 GB	DDR5 (1.1 V), 4800 MT/s	4400 MT/s
	4 R	128 GB	DDR5 (1.1 V), 4800 MT/s	4400 MT/s

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

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 4400 MT/s or 4000 MT/s depending on the following factors:

- System profile selected (for example, Performance, Workstation 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 single-processor systems, sockets A1 to A8 are available.
  - A minimum of 1 DIMM must be populated for each installed processor.
- In **Optimizer Mode**, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.

Table 98. Memory population rules

Processor	Memory population	Memory population information
Single processor	A{1}, A{2}, A{3}, A{4}, A{5}, A{6}, A{7}, A{8}	1, 2, 4, 6 and 8 DIMMs are allowed.

- Mixing of any different memory module capacities in a system is not supported.
- Always populate memory channels identically with equal DIMMs for best performance.

● Supported RDIMM configurations are 1, 2, 4, 6 and 8 DIMMs.

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 processor air shroud.

ⓘ **NOTE:** The procedure to remove the memory module is the same for Rear Accessed and Front Accessed configurations.

⚠ **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.**

⚠ **CAUTION: To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. Remove memory module blanks only if you intend to install memory modules in those sockets.**

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.
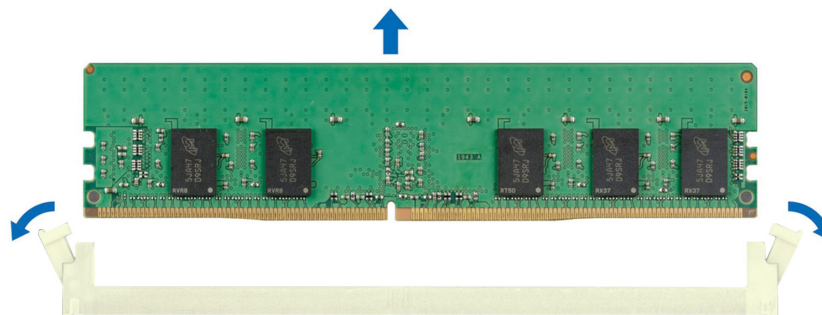
Figure 77. Removing a memory module

Next steps

Replace the memory module.

Installing a memory module

Prerequisites

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

2. Follow the procedure listed in the Before working inside your system .
3. Remove the processor air shroud.

(i) **NOTE:** The procedure to install the memory module is the same for Rear Accessed and Front Accessed configurations.

(i) **NOTE:** The empty DIMM slots should be installed with memory module blanks and the removal and install procedure for memory module blanks is the same as the removal and install procedure of memory modules.

⚠ **CAUTION: To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. Remove memory module blanks only if you intend to install memory modules in those sockets.**

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 blank is installed in the socket, remove it.

   (i) **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.**

   (i) **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.
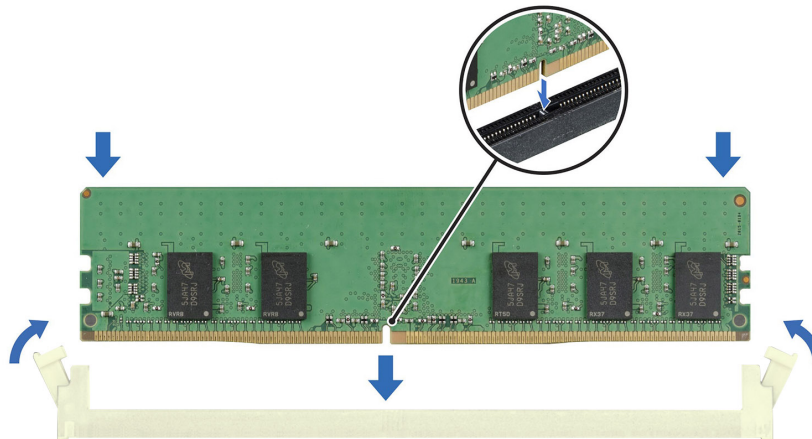
Figure 78. Installing a memory module

Next steps

1. Install the processor 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

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 processor air shroud.

(i) **NOTE:** The procedure to remove the heat sink is the same for Rear Accessed and Front Accessed configurations.

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

Steps

1. Ensure all four anti-tilt wires are in the locked position (outward position), and then using a Torx T30 tool, loosen the nuts on the heat sink in the order that is mentioned below:
   a. Loosen the first nut completely.
   b. Loosen the nut diagonally opposite to the nut you loosened first.
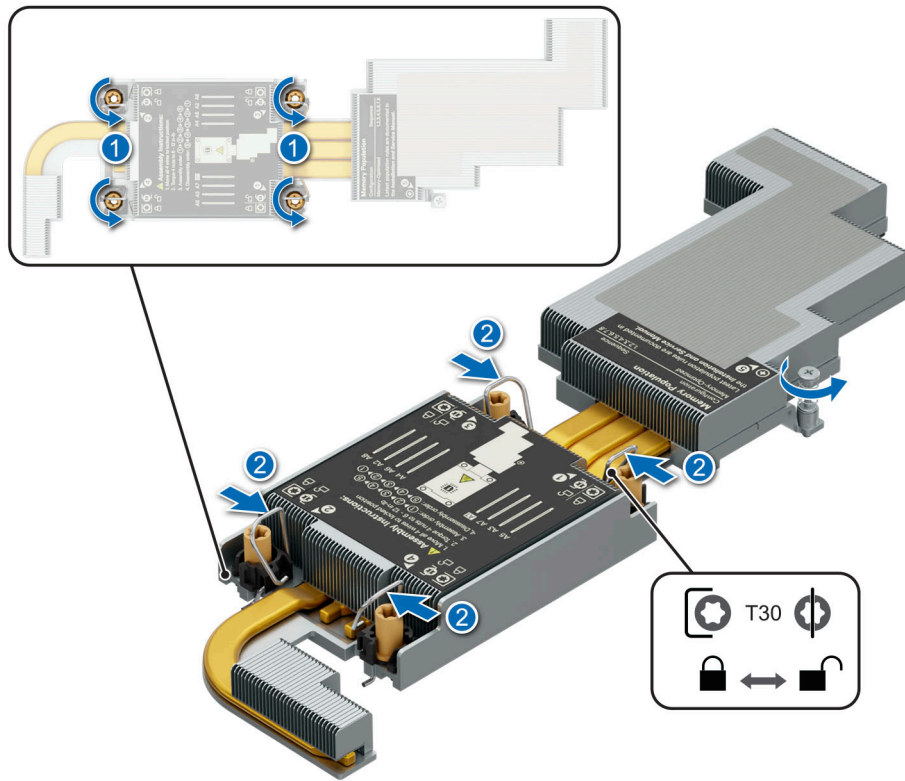   c. Repeat the procedure for the remaining two nut.

Figure 79. Loosening the nuts and set the anti-tilt wires to the unlocked position

2. Set the anti-tilt wires to the unlocked position (inward position).
3. Lift the processor and heat sink module (PHM) from the system and set the PHM aside with the processor side facing up.
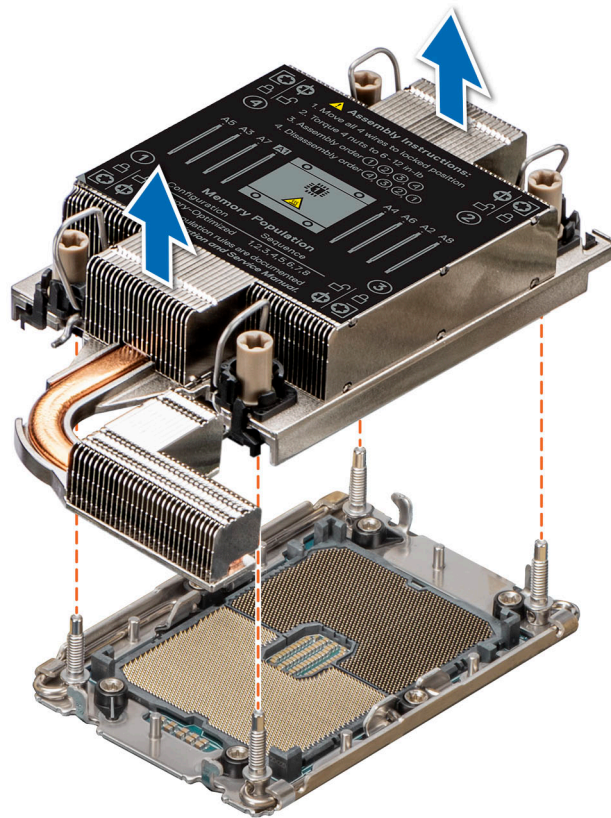
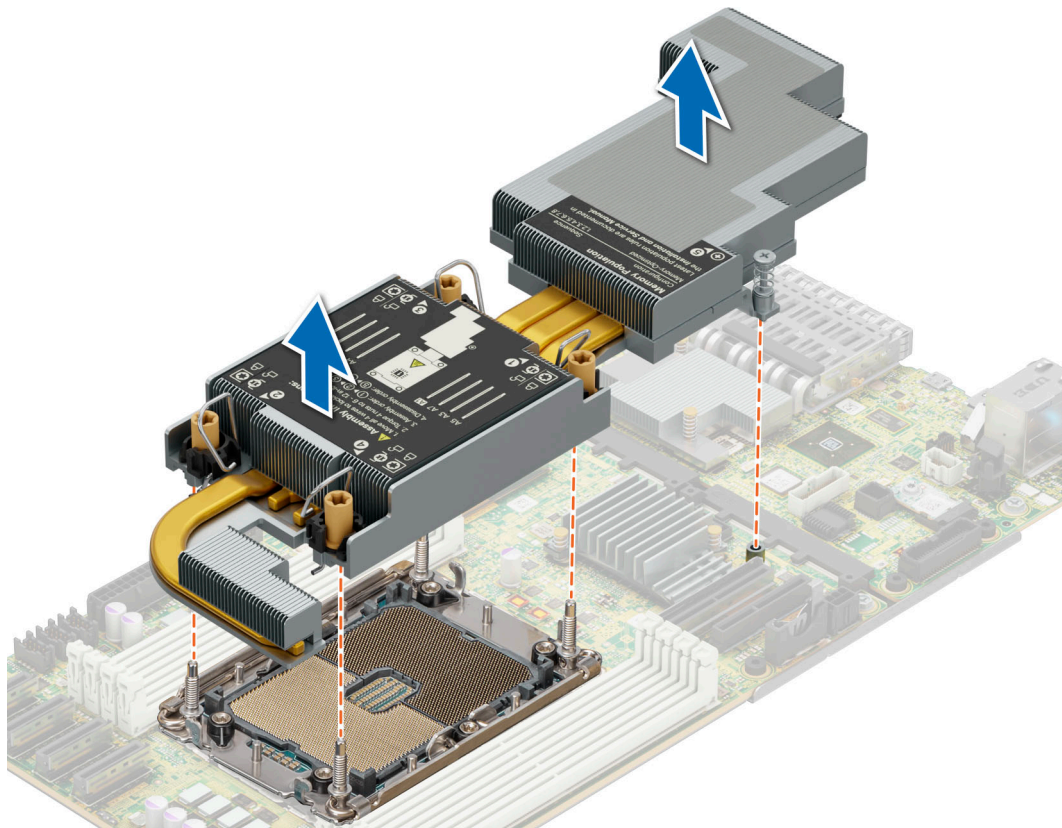**Figure 80. Removing a heat sink**

Next steps

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

Removing the processor and extended heat sink 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 processor air shroud.

   ⓘ **NOTE:** The procedure to remove the heat sink is the same for Rear Accessed and Front Accessed configurations.

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

Steps

1. Ensure all four anti-tilt wires are in the locked position (outward position), and then using a Torx T30 tool, loosen the nuts on the heat sink in the order that is mentioned below:
   a. Loosen the first nut completely.
   b. Loosen the nut diagonally opposite to the nut you loosened first.
   c. Repeat the procedure for the remaining two nut.

Figure 81. Loosening the nuts and set the anti-tilt wires to the unlocked position

2. Set the anti-tilt wires to the unlocked position (inward position).
3. Lift the processor and extended heat sink module (PHM) from the system and set the PHM aside with the processor side facing up.

Figure 82. Removing an extended heat sink

Next steps

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

Removing the processor from the processor heat sink module

Prerequisites

⚠ **WARNING: Remove the processor from the 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 processor air shroud.
4. Remove the heat sink.

ⓘ **NOTE:** The procedure to remove the processor is the same for Rear Accessed and Front Accessed configurations.

ⓘ **NOTE:** The procedure to remove the processor is the same for the extended heat sink.

⚠ **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 up the Thermal Interface Material (TIM) break lever to release the processor from the TIM and carrier.
3. Holding the processor by the edges, lift the processor away from the carrier.

(i) **NOTE:** Ensure to hold the carrier to the heat sink as the TIM break is rotated.

4. Place the processor connector side down on the processor tray. Ensure pin 1 marks are aligned.
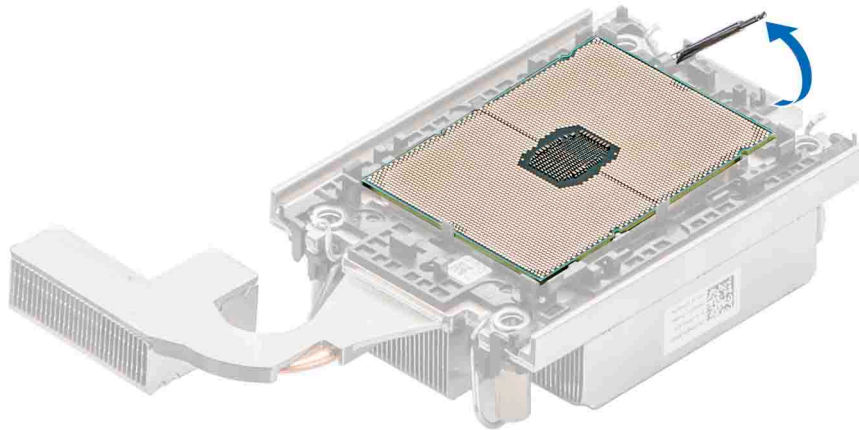
Figure 83. Lift up the TIM break lever

5. Using your thumb and index finger, first hold the carrier release tab at the pin 1 connector, pull out the tip of the carrier release tab, and then lift the carrier partially from the heat sink.
6. Repeat the procedure at the remaining three corners of the carrier.
7. After all the corners are released from the heat sink, lift the carrier from the pin 1 corner of the heat sink.
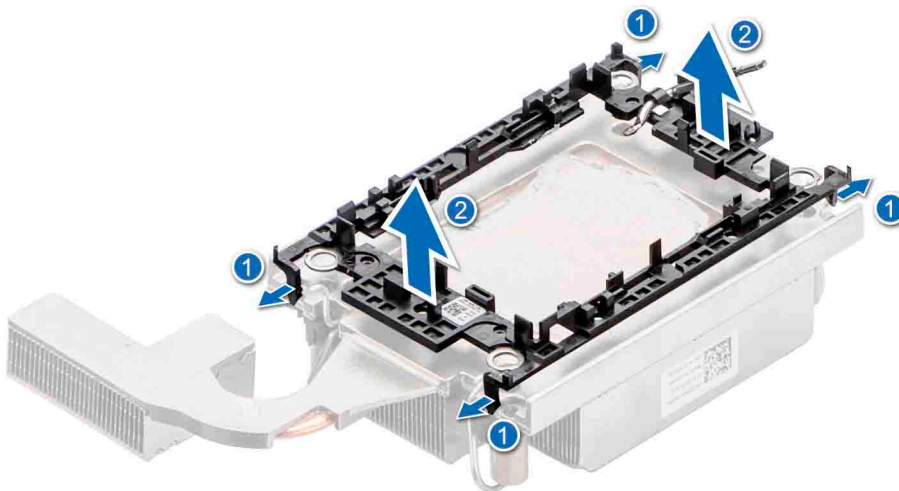
Figure 84. Removing the processor carrier

Next steps

Replace the processor.

Installing the processor into a processor heat sink module

Prerequisites

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

(i) **NOTE:** The procedure to install the processor is the same for Rear Accessed and Front Accessed configurations.

(i) **NOTE:** The procedure to install the processor is the same for the extended heat sink.

Steps

1. Place the processor in the processor tray.

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

2. Place the processor carrier on top of the processor that is in the processor tray aligning pin 1 indicator on the processor.

   (i) **NOTE:** Ensure that the pin 1 indicator on the carrier is aligned with the pin 1 indicator on the processor before placing the carrier on the processor.

   (i) **NOTE:** Ensure that the processor and the carrier are placed in the tray before you install the heat sink.
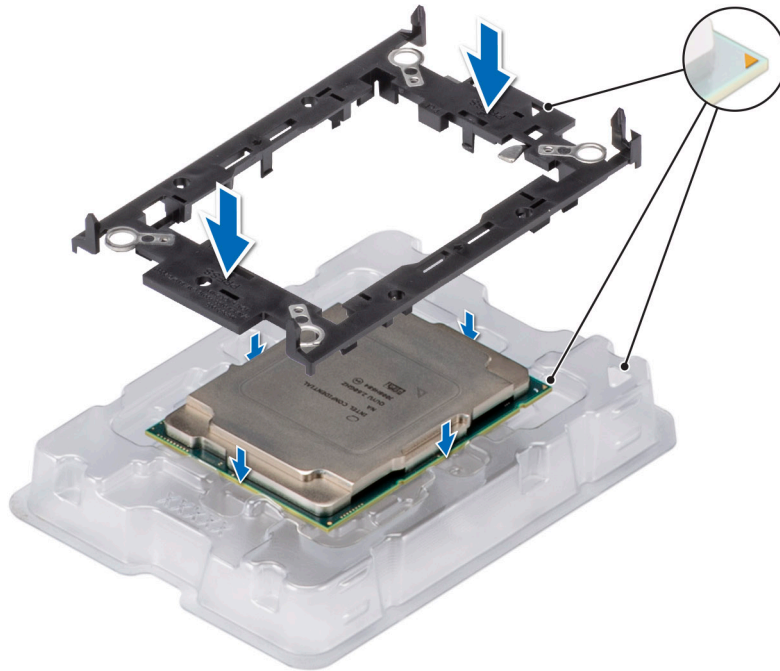
Figure 85. Installing the processor carrier

3. To align the processor tray with the bracket, press down on the bracket with your fingers on all four sides until it clicks into place.

   (i) **NOTE:** Ensure that the processor is securely latched to the processor carrier.
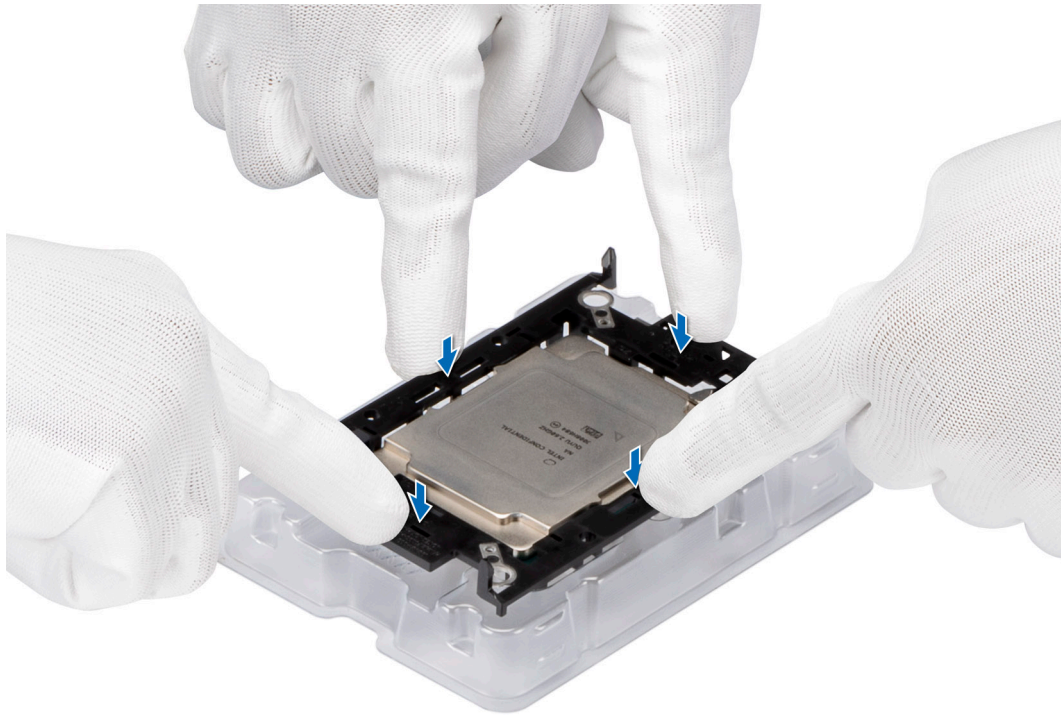
Figure 86. Press the carrier on the four sides

4. If you are using an existing heat sink, remove the thermal grease on 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 quadrilateral design on the bottom of the heat sink.
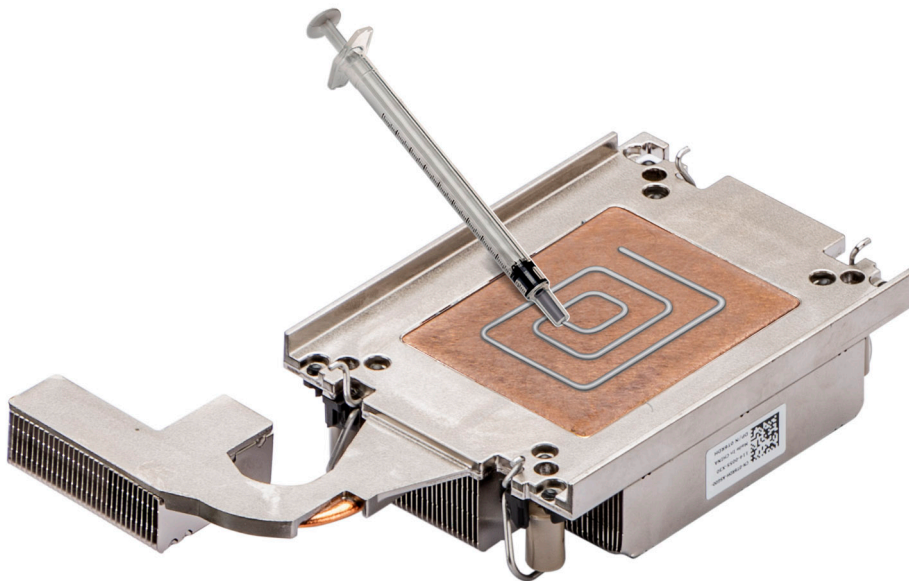
Figure 87. Applying thermal grease on the heat sink

> ⚠️ **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 of the syringe after you use it.

6. For new heat sink. remove the Thermal Interface Material (TIM) protective film from the base of heat sink.
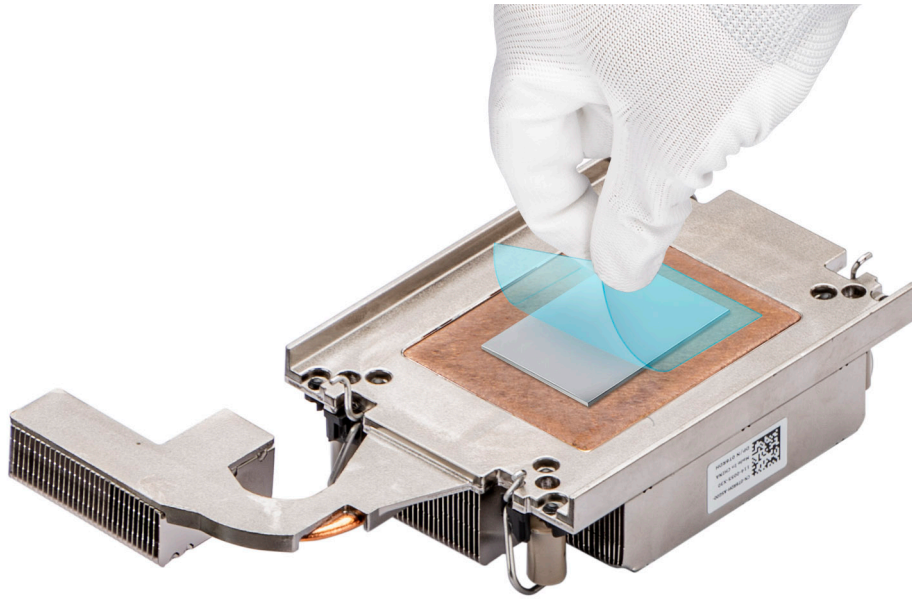
Figure 88. Remove the Thermal Interface Material (TIM) protective film

7. Place the heat sink on the processor and press the heat sink until the carrier 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 that the pin 1 indicator on the heat sink is aligned with the pin 1 indicator on the carrier before placing the heat sink onto the processor carrier.

ⓘ **NOTE:** Ensure latching features on processor carrier and heat sink are aligned during assembly.
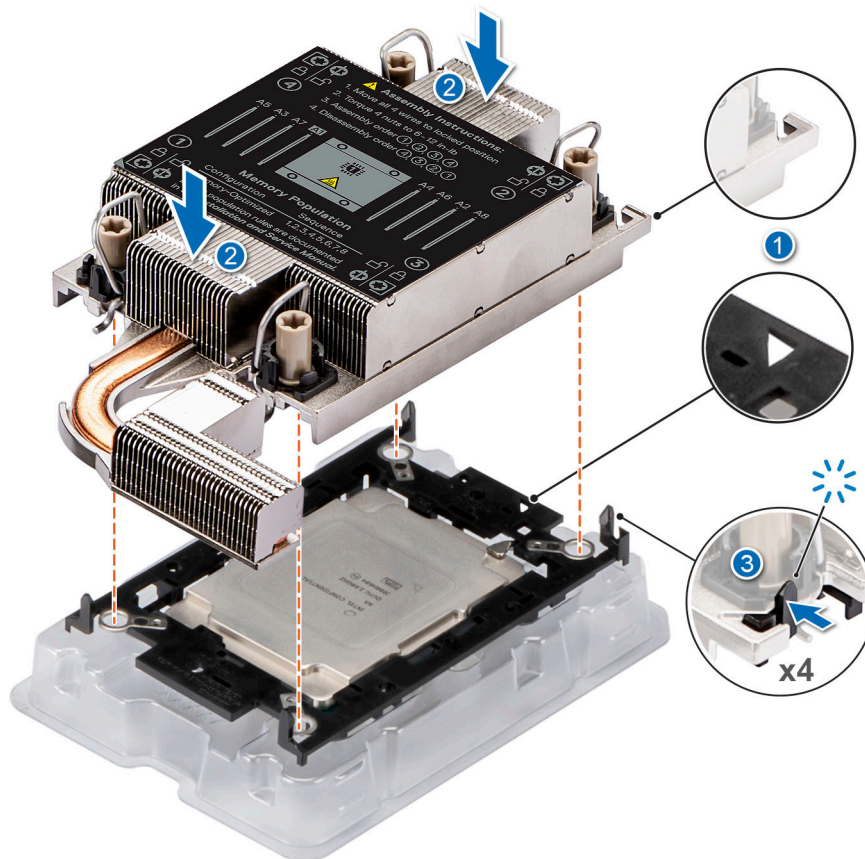
Figure 89. Installing the heat sink onto the processor

Next steps

1. Replace the heat sink.
2. Replace the processor air shroud.
3. 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 processor air shroud.

ⓘ **NOTE:** The procedure to install the heat sink is the same for Rear Accessed and Front Accessed configurations.

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 and heat sink on the processor socket.

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

   ⓘ **NOTE:** Ensure that the processor and heat sink is held parallel to the system board to prevent damaging the components.
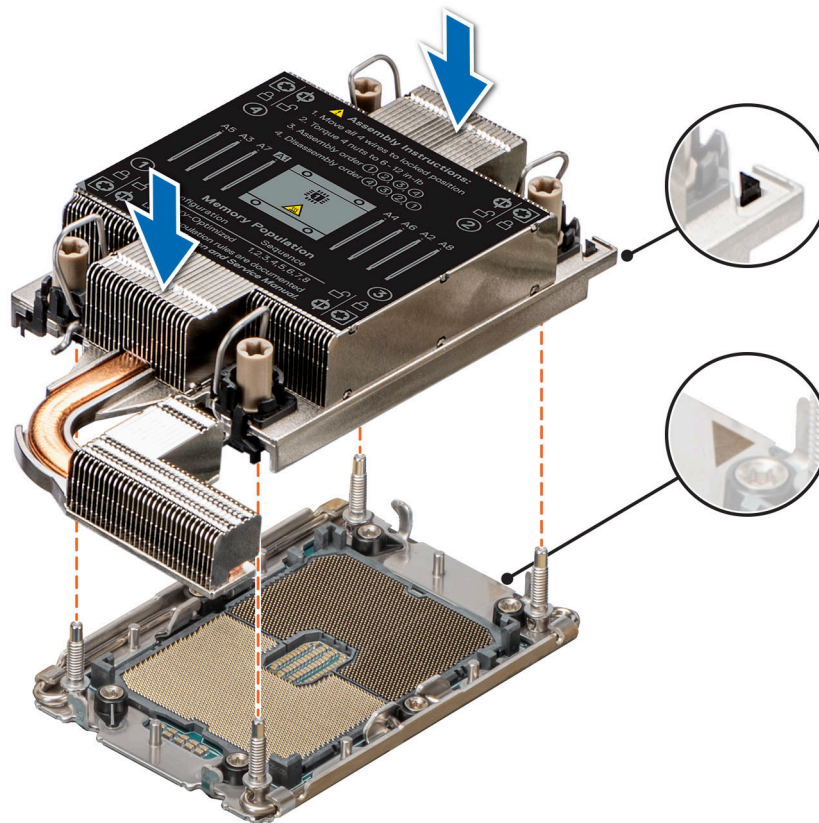
Figure 90. Installing the processor and heat sink (PHM)

3. Set the anti-tilt wires to the locked position (outward position), and then using the Torx T30 tool, tighten the captive nuts (8 in-lbf) on the heat sink in the order below:

   a. Tighten the first nut completely.
   b. Tighten the nut diagonally opposite to the nut you tighten first.
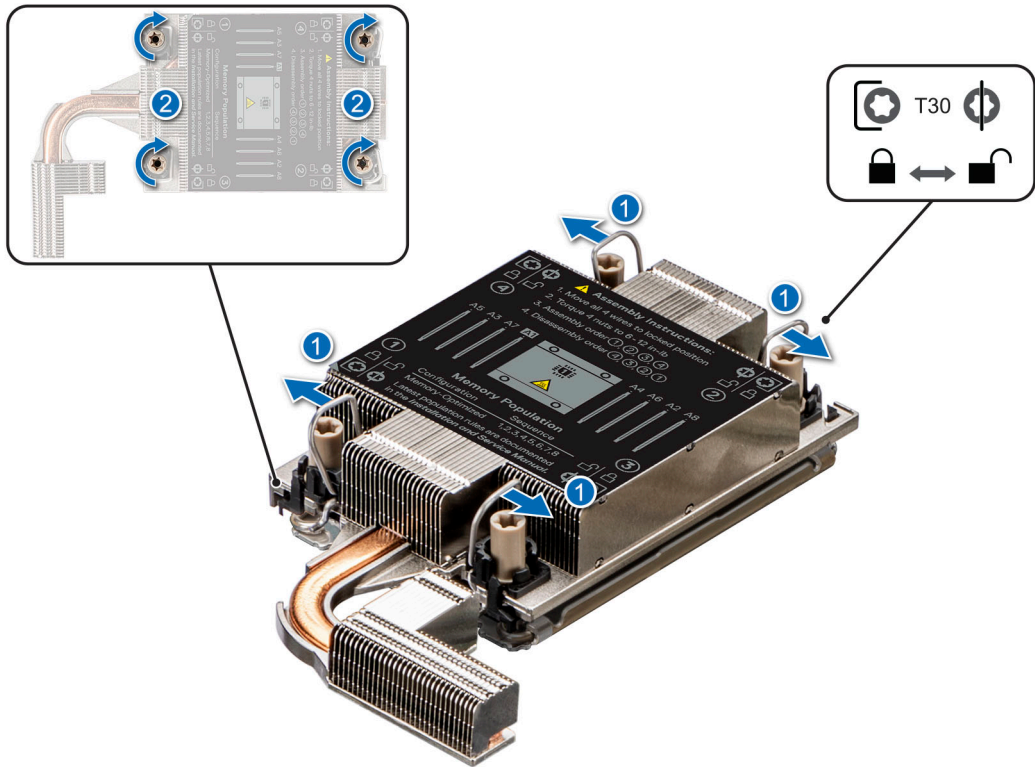   c. Repeat the procedure for the remaining two nuts.

Figure 91. Set the anti-tilt wires to the locked position and tightening the nuts

Next steps

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

Installing the processor and extended 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 processor air shroud.
4. If applicable, remove the OCP card.
5. Remove the OCP riser.
6. If applicable, remove the processor and heat sink module.

ⓘ **NOTE:** The procedure to install the heat sink is the same for Rear Accessed and Front Accessed configurations.

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 extended heat sink to the system board, and then place the processor and extended heat sink on the processor socket.

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

ⓘ **NOTE:** Ensure that the processor and extended heat sink is held parallel to the system board to prevent damaging the components.
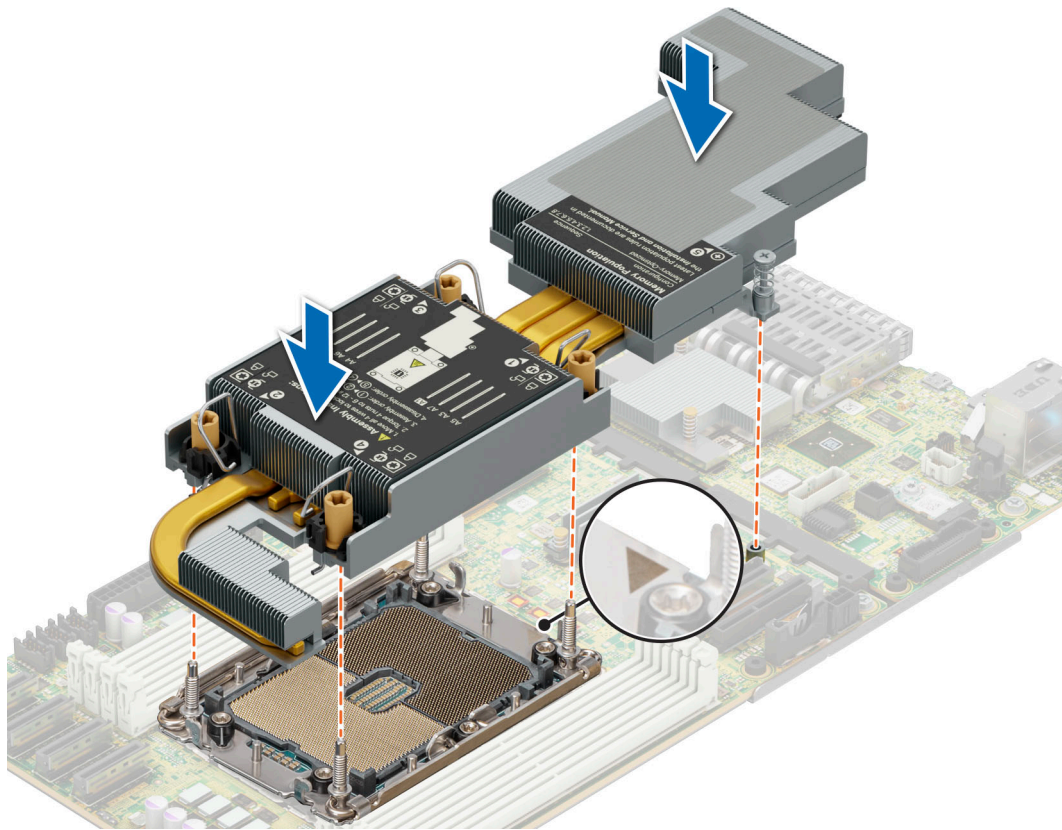
Figure 92. Installing the processor and extended heat sink (PHM)

3. Set the anti-tilt wires to the locked position (outward position), and then using the Torx T30 tool, tighten the captive nuts (8 in-lbf) on the extended heat sink in the order below:

   a. Tighten the first nut completely.
   b. Tighten the nut diagonally opposite to the nut you tighten first.
   c. Repeat the procedure for the remaining two nuts.
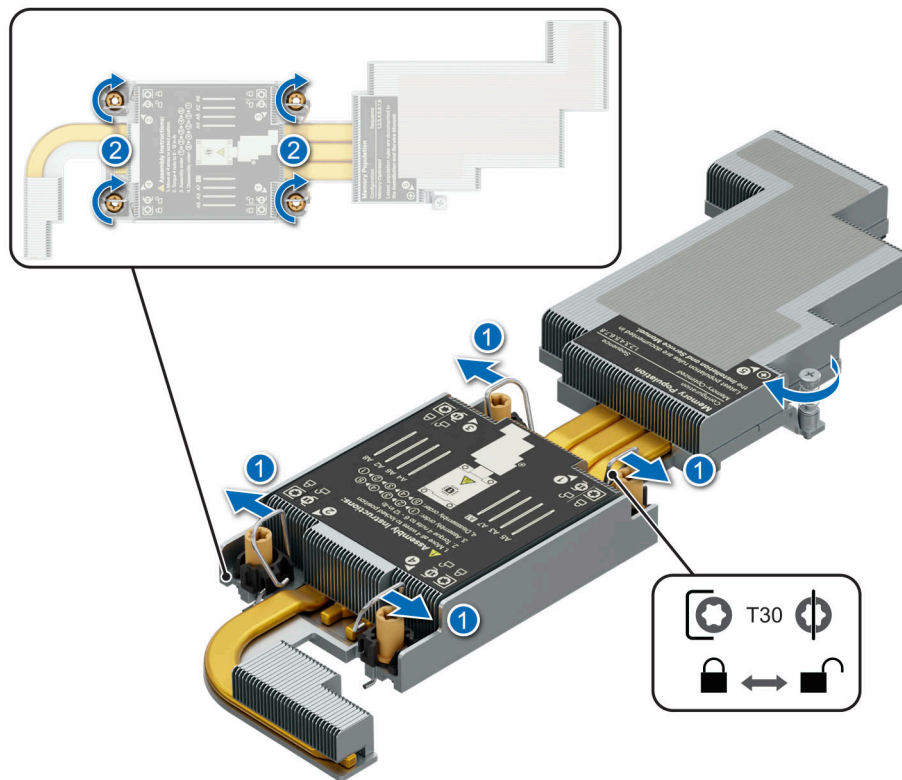
Figure 93. Set the anti-tilt wires to the locked position and tightening the nuts

Next steps

1. Replace the processor 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
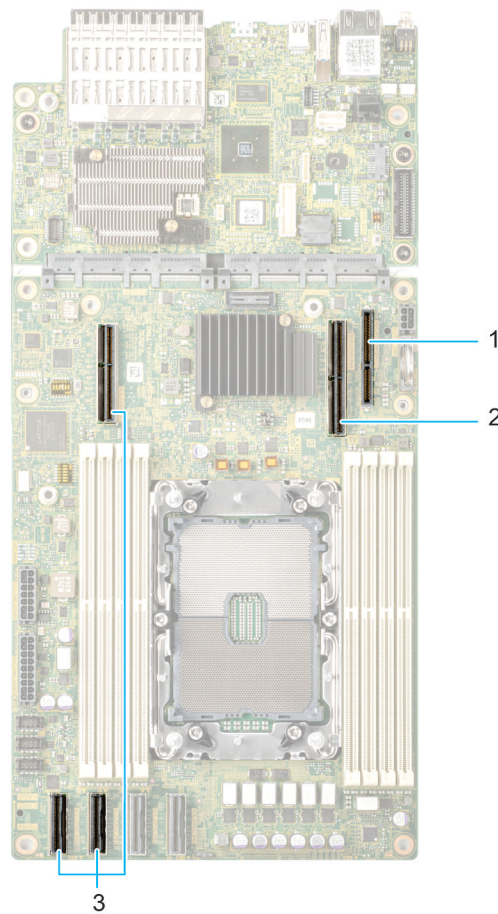
Figure 94. Expansion card slot connectors

1. BOSS N1 connector
2. Riser 1 FLOP OCP connector
3. Riser 3 connector

The following table describes the expansion card riser configurations:

Table 99. Expansion card riser configurations

Configurations	Expansion card risers	PCIe Slots	Controlling processor	Height	Length	Slot width
Config0.	No Riser	No slots	Processor 1	None	None	None
Config1.	R1+R3	x16 FLOP OCP	Processor 1	None	INT	x16
		1, 2		Full Height	Half length	x16
Config2.	R1	x16 FLOP OCP	Processor 1	None	INT	x16
Config3.	R3	1, 2	Processor 1	Full Height	Half length	x16
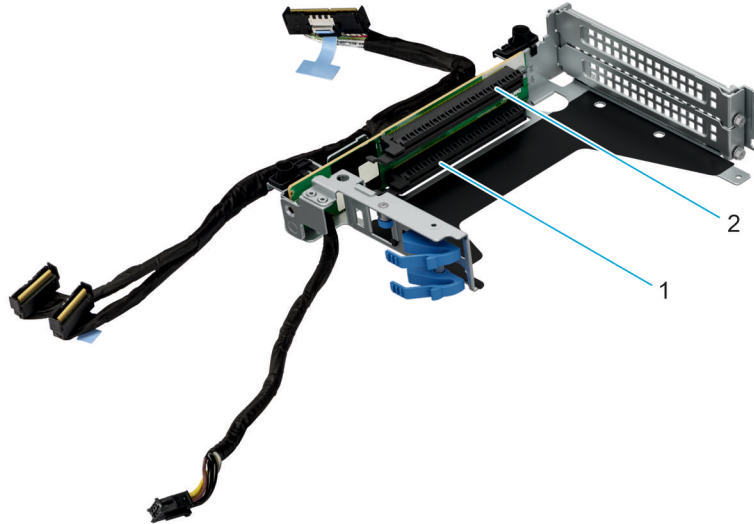
Figure 95. Riser 3
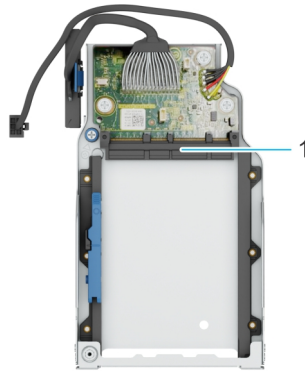
Figure 96. OCP riser

1. x16 FLOP OCP Gen4 slot

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

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.

(i) **NOTE:** PERC H965i adapter can only be installed in slot 1 of the riser 3. Slot 2 must be empty.

(i) **NOTE:** SmartNIC and PERC H965e or H355e cannot be installed simultaneously. Any storage card with an external port can only be supported in riser 3 slot 1.

Table 100. Configuration 0: No Riser for Rear Accessed configuration

Card type	Slot priority	Maximum number of cards
Dell BOSS N1 card Module	Integrated slot	1

Table 101. Configuration 1: R1+R3

Card type	Slot priority	Maximum number of cards
Dell BOSS N1 card Module	INT	1

Table 101. Configuration 1: R1+R3 (continued)

Card type	Slot priority	Maximum number of cards
Pensando SmartNIC: 25 GbE SFP28 2P (FH)	1	1
Mellanox SmartNIC: 25GbE SFP28 2P (FH)	1	1
Pensando SmartNIC: 100 GbE 2P PCIe (FH)	1	1
Intel SmartNIC: 100 GbE 2P (FH)	1	1
Intel (NIC: 25G) (FH), 4P, S28	1,2	2
Intel (NIC: 10G) (FH), S28,	1,2	2
Intel (NIC: 100G) (FH), 2P, QSF	1,2	2
PERC H355 Adapter	1,2	1
PERC H755 Adapter	1,2	1
PERC H965I Adapter	1	1
HBA355I Adapter	1,2	1
HBA355E Adapter (FH)	1	1
NVIDIA (GPU A2)	1,2	2
ACC100 eASIC	1,2	2
Intel (NIC: 100G) (FH), 2P, Q28	1,2	2
Broadcom (NIC: 25G) (FH), 4P, S28	1,2	2
Broadcom (NIC: 10G) (FH), 4P, BT	1,2	2
Broadcom (NIC: 100G) (FH), 2P, Q56	1,2	2
Mellanox CRD,NTWK,MLNX,FH,25G,2P, S28	1,2	2
Mellanox (NIC: 100G) (FH), 2P, Q56	1,2	2
Broadcom (NIC: 25G) (FH2)	1,2	2
Broadcom (NIC: 10G) (FH)	1,2	2
Broadcom (NIC: 1G) V2	1,2	2
Intel (NIC: 25G) (FH) 2P, S28	1,2	2
Intel (NIC: 10G) (FH) 4P,BT	1,2	2
Intel (NIC: 1G) V3	1,2	2
Intel (NIC: 10G) (FH) 2P, BT	1,2	2
Intel (OCP 3.0:25G) 4P, S28	INT	1
Intel (OCP 3.0: 10G) 4P, BT	INT	1
Broadcom (OCP 3.0: 10G) 2P, BT	INT	1
Broadcom (OCP 3.0: 1G) 4P, BT	INT	1
Intel (OCP 3.0: 25G) 2P, S28	INT	1
Broadcom (OCP 3.0:25G)	INT	1

Table 102. Configuration 1: R1

Card type	Slot Priority	Maximum number of cards
Dell BOSS-N1, MONOLITHIC	INT	1
Intel (OCP 3.0: 25G) 4P, S28	INT	1
Intel (OCP 3.0: 10G) 4P, BT	INT	1
Broadcom (OCP 3.0: 10G) 2P, BT	INT	1
Broadcom (OCP 3.0:1G) 4P, BT	INT	1
Intel (OCP 3.0: 25G) 2P, S28	INT	1
Broadcom (OCP 3.0: 25G) 4P, V2	INT	1
Broadcom (OCP 3.0: 25G) 2P, V2	INT	1

Table 103. Configuration 1: R3

Card type	Slot Priority	Maximum number of cards
Dell BOSS-N1, MONOLITHIC	INT	1
Pensando (SmartNIC: 25 GbE) SFP28 2P (FH)	1	1
Mellanox (SmartNIC: 25 GbE) SFP28 2P (FH)	1	1
Pensando (SmartNIC: 100 GbE) 2P (FH)	1	1
Intel (SmartNIC: 100 GbE) 2P (FH)	1	1
Intel (NIC: 25G) (FH) 4P, S28	1,2	2
Intel (NIC: 25G) (FH) 4P, S28	1,2	2
Intel (NIC: 25G) (FH) 4P, S28	1,2	2
Intel (NIC: 10G) S28	1,2	2
Intel (NIC: 100G) (FH) 2P, QSF	1,2	2
PERC H355 Adapter	1,2	1
PERC H755 Adapter	1,2	1
PERC H965I Adapter	1	1
HBA355I Adapter	1,2	1
HBA355E Adapter (FH)	1	1
NVIDIA (GPU: A2)	1,2	2
ACC100 eASIC	1,2	2
Intel (NIC: 25G) (FH) 4P, S28	1,2	2
Intel (NIC: 100G) (FH) 2P, Q28	1,2	2
Broadcom (NIC: 25G) (FH) 4P, S28	1,2	2
Broadcom (NIC: 10G) (FH) 4P, BT	1,2	2
Broadcom (NIC: 100G) (FH) 2P, Q56	1,2	2
Mellanox (NIC: 25G) (FH) 2P, S28	1,2	2
Mellanox (NIC: 100G) (FH) 2P, Q56	1,2	2
Broadcom (NIC: 25G) (FH2)	1,2	2
Broadcom (NIC: 10G) (FH)	1,2	2

Table 103. Configuration 1: R3 (continued)

Card type	Slot Priority	Maximum number of cards
Broadcom (NIC: 1G) V2	1,2	2
Intel (NIC: 25G) (FH) 2P, S28	1,2	2
Intel (NIC: 10G) (FH) 4P, BT	1,2	2
Intel (NIC: 1G) V3	1,2	2
Intel (NIC: 1G) (FH) 2P, BT	1,2	2

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 .

(i) **NOTE:** The procedure to remove the expansion card risers is the same for Rear Accessed and Front Accessed configurations.

Steps

For riser 3, first disconnect the cables from the system board. Using the Phillips 2 screwdriver, loosen the blue thumbscrew. Holding the blue touch point, lift the expansion card riser from the riser connector on the system board.
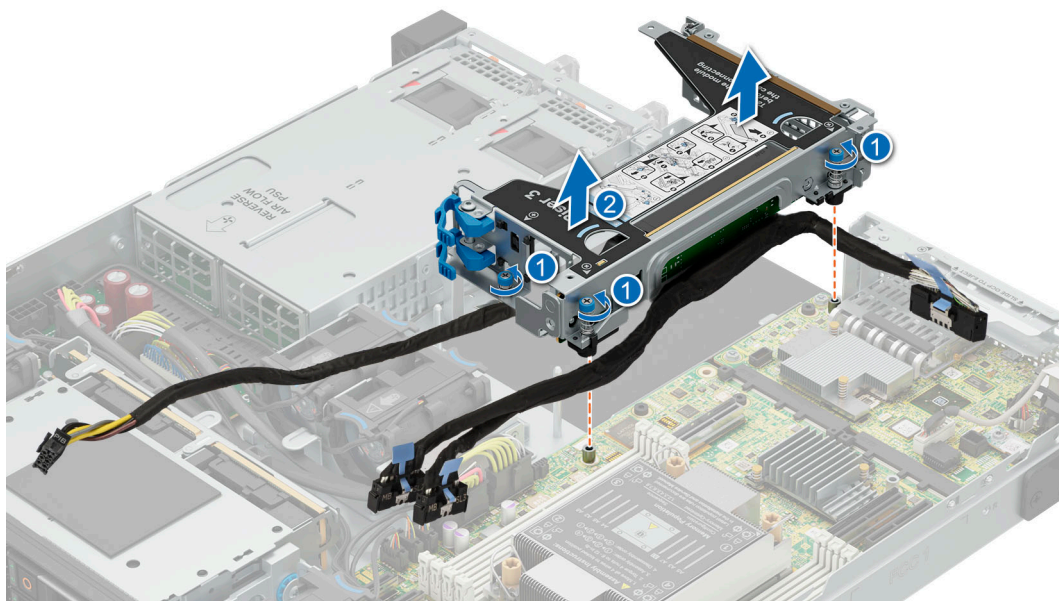
Figure 97. Removing the expansion card riser 3

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. If removed, install the expansion cards into the expansion card risers and connect all the riser cables.

(i) **NOTE:** The procedure to install the expansion card risers is the same for Rear Accessed and Front Accessed configurations.

Steps

For Riser 3, holding the blue touch points, align the expansion card riser with the guide pins on the side wall of the chassis and with the connector on the system board. Lower the expansion card riser into place until the expansion card riser connector is fully seated in the connector on the system board. Reconnect the cables from the system board. Route the power cable along the riser cage, next to the riser 1 compartment. Using Phillips 2 screwdriver, tighten the blue thumbscrew.

Figure 98. Installing the expansion card riser
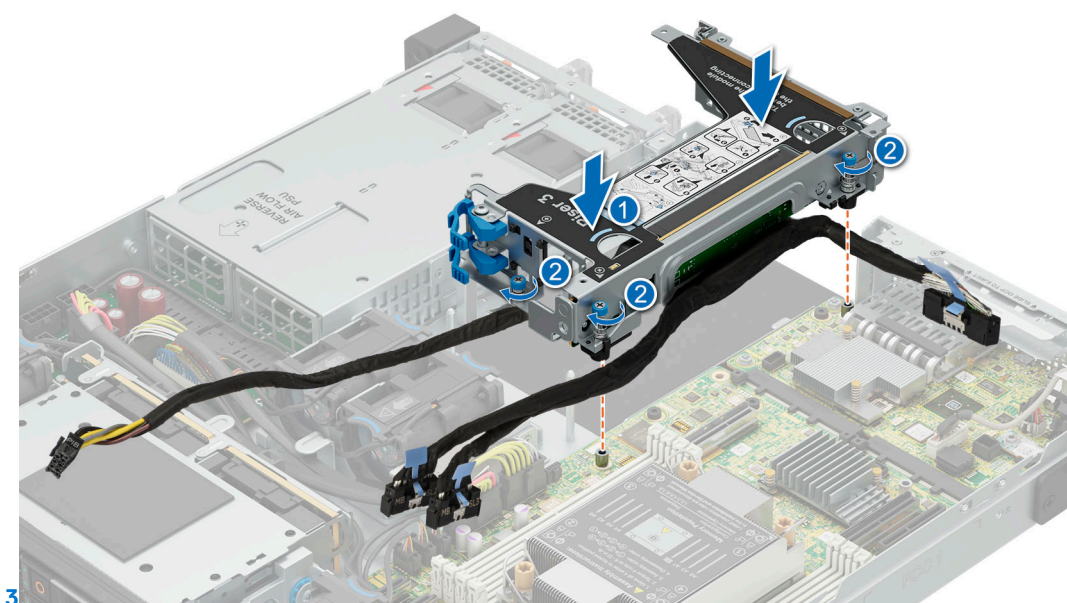
Next steps

1. Follow the procedure listed in After working inside your system.
2. Install any device drivers required for the card as described in the documentation for the card.

Removing an 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. Remove the expansion card risers.

(i) **NOTE:** The procedure to remove the expansion card is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Press and rotate the expansion card retention latch lock to open. Using a Phillips 2 screwdriver, loosen the screw on the expansion card bracket.

2. Hold the expansion card by its edges and pull the card until the card edge connector disengages from the connector on the expansion card riser.

   (i) **NOTE:** The expansion card retention latch lock is only used for when a low-profile card is installed. If a shorter or taller card is installed the side latch is not applicable.
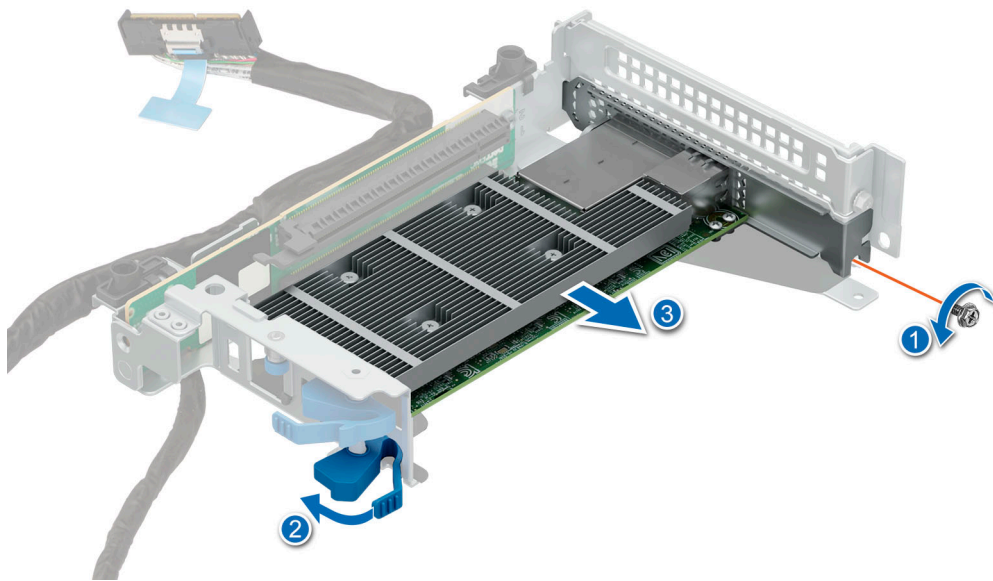
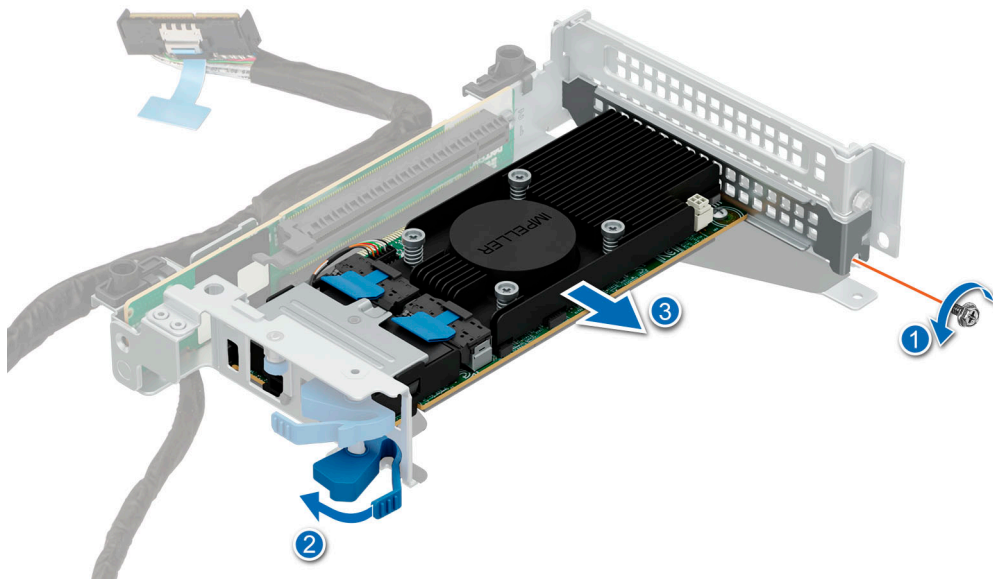**Figure 99. Removing the low profile expansion card from riser 3**
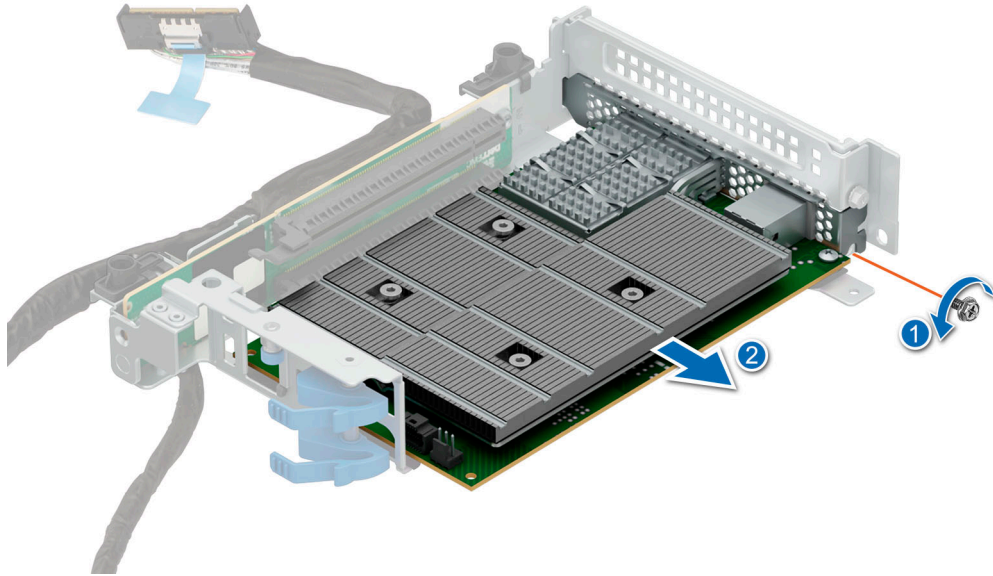

Figure 100. Removing single width GPU card from Riser 3

Figure 101. Removing a full-height expansion card from Riser 3

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

   (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.
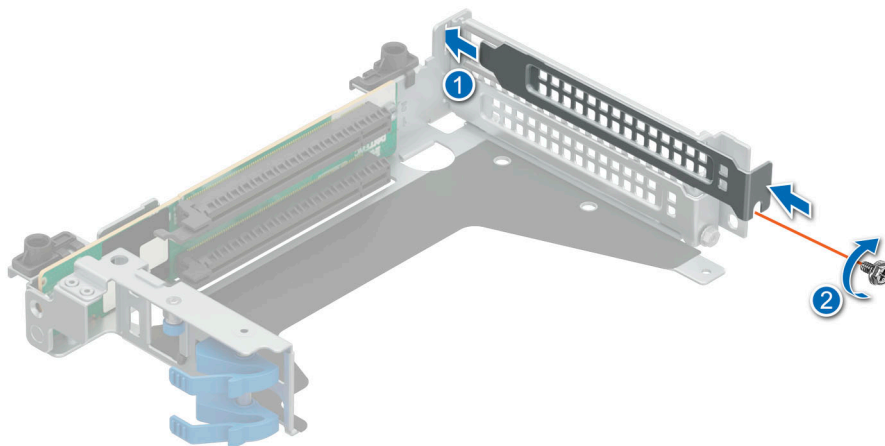

Figure 102. Installing filler bracket in Riser 3

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.

(i) **NOTE:** The procedure to install the expansion card is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Press and rotate 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.
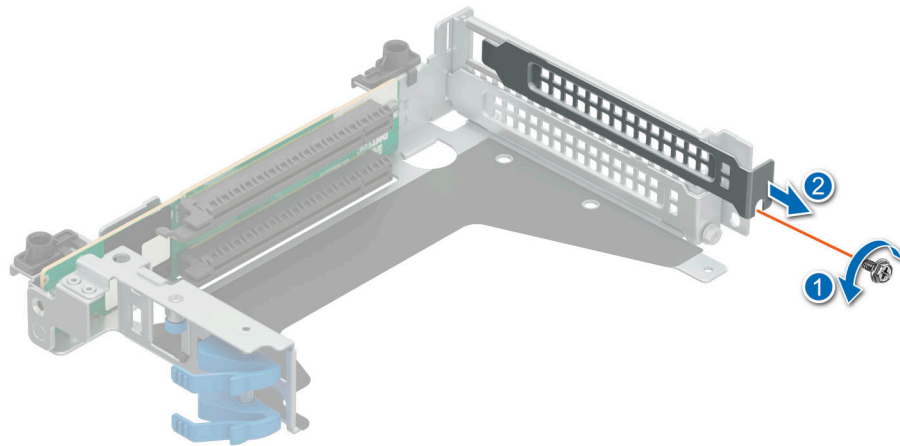
Figure 103. Removing a filler bracket from Riser 3

3. Hold the card by the edges, and align the card edge connector with the expansion card connector on the riser.
4. Insert the card edge connector firmly into the expansion card connector until the card is fully seated.
5. Rotate and close expansion card retention latch lock to secure the card in place.

   (i) **NOTE:** The expansion card retention latch lock is only used for when a low-profile card is installed. If a shorter or taller card is installed the side latch is not applicable.

6. Using a Phillips 2 screwdriver, secure the screw to the expansion card bracket.
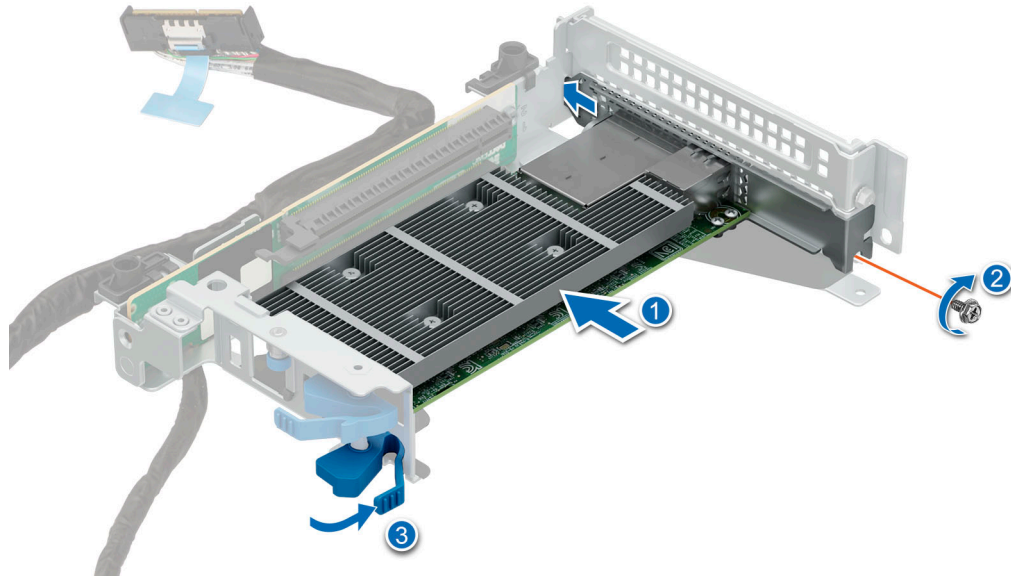
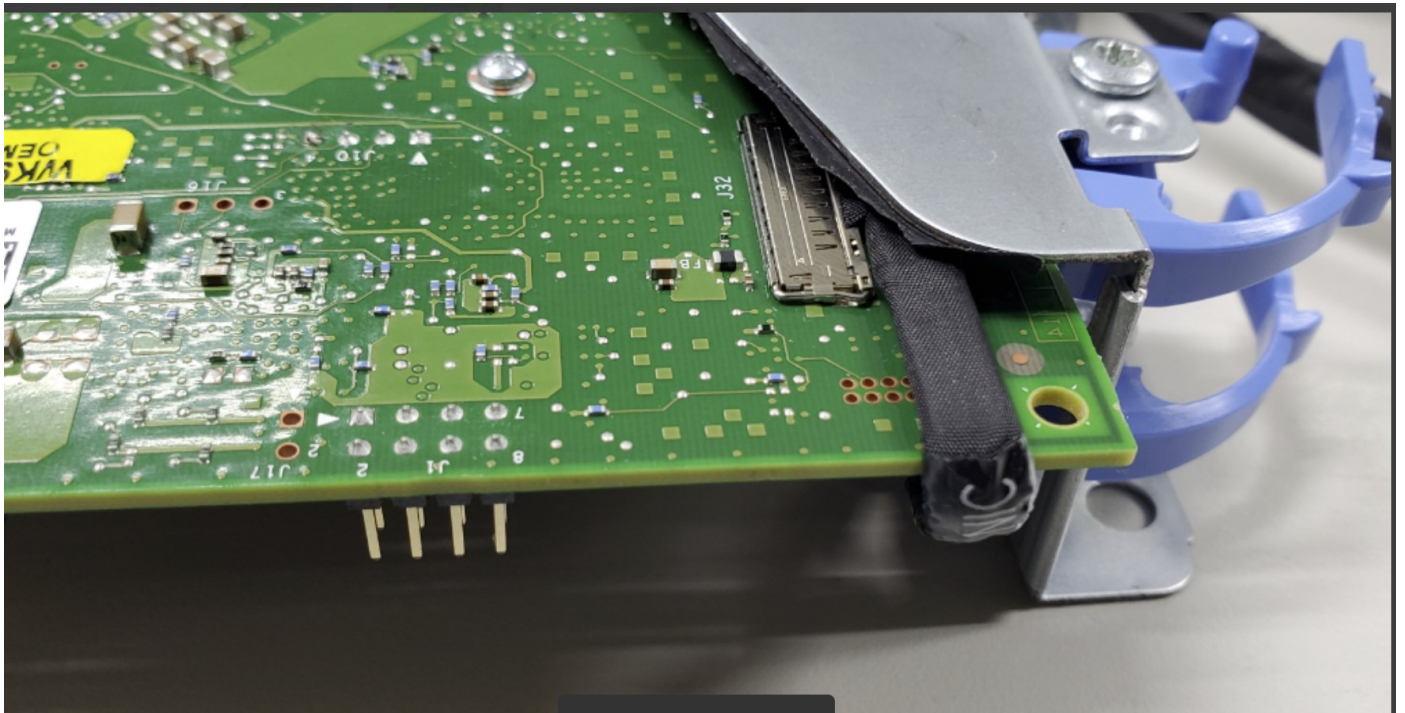**Figure 104. Installing a low-profile expansion card into Riser 3**

Figure 105. Installing a full-height expansion card into Riser 3 (Intel Ethernet 25G 4P E810-XXV-stg Adapter)

(i) **NOTE:** Before installing the Intel(R) Ethernet 25G 4P E810-XXV-stg Adapter, ensure that the NCSI cable is properly routed as shown in the image to avoid damage.

Next steps

1. Follow the procedure listed in After working inside your system.
2. Install any device drivers required for the card as described in the documentation for the card.

(i) **NOTE:** While replacing a faulty storage controller or NIC card or GPU with the same type of card, after you power on the system; the new card automatically updates to the same firmware and configuration of the faulty one. For more information

about the Part replacement configuration, see the *Dell Lifecycle Controller User's Guide* available at https://www.dell.com/idracmanuals

M.2 SSD module

Removing the 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.

ⓘ **NOTE:** The procedure to remove the BOSS N1 card is the same for Rear Accessed and Front Accessed configurations.

Steps

Holding the blue tag, pull the BOSS N1 card away from the system board connector.
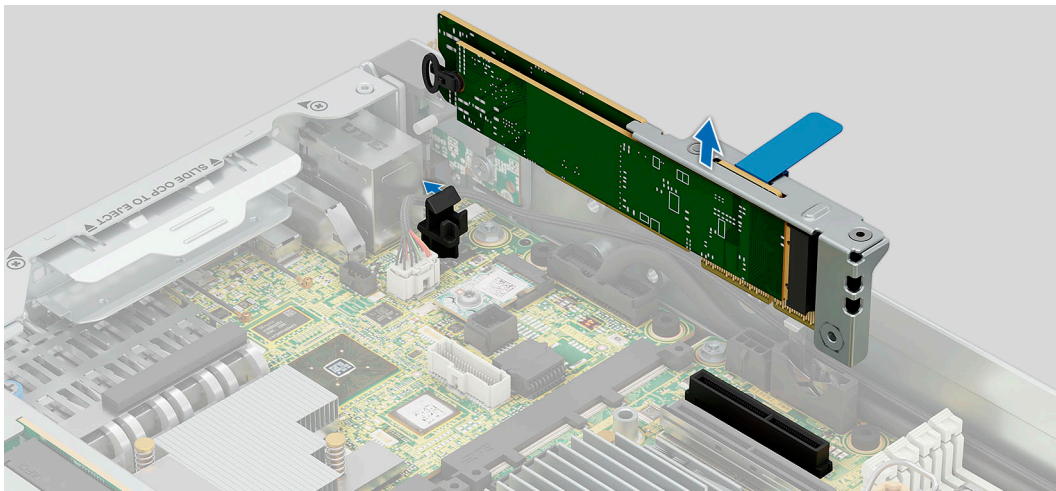
Figure 106. Removing the BOSS N1 card

Next steps

Replace the BOSS N1 card.

Installing the BOSS N1 card

Prerequisites

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

ⓘ **NOTE:** The procedure to install the BOSS N1 card is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Align and insert the BOSS N1 card connector with the connectors on the system board.
2. Press the BOSS N1 card firmly until it is fully seated.
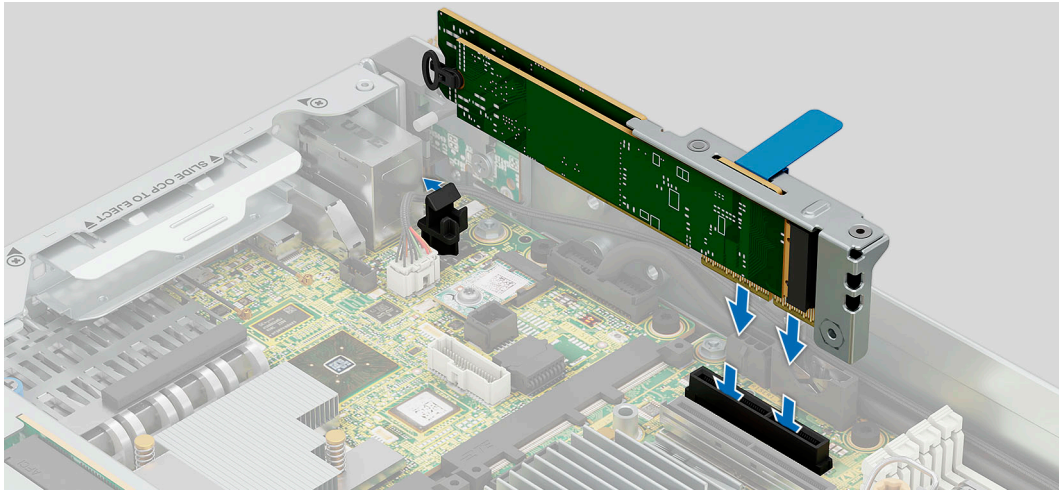
Figure 107. Installing the BOSS N1 card into the system board

Next steps

Follow the procedure listed in After working inside your system.

Removing M.2 SSD module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Remove the BOSS N1 card.

ⓘ **NOTE:** The procedure to remove the M.2 SSD module is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Using the Phillips 1 screwdriver, remove the screw securing the M.2 SSD module to the BOSS N1 card.
2. Pull the M.2 SSD module to disconnect from the connector on the BOSS N1 card.
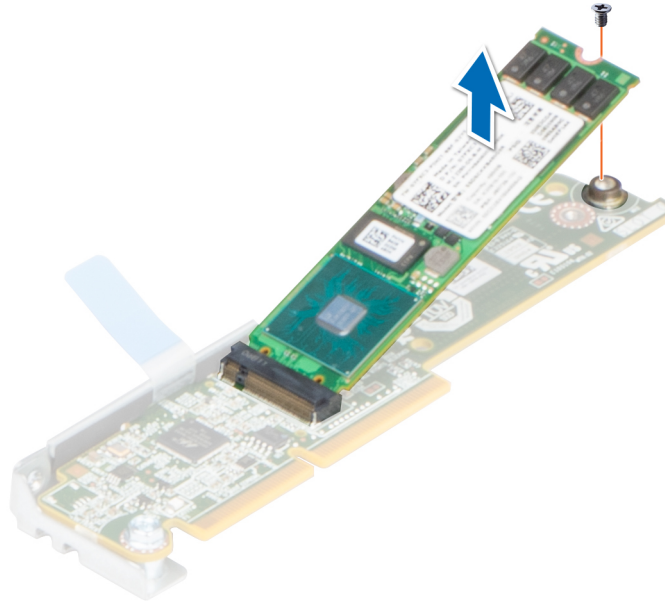
Figure 108. Removing the M.2 SSD module

Next steps

If applicable, install the M.2 SSD module.

Installing M.2 SSD module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the BOSS N1 card.

ⓘ **NOTE:** The procedure to install the M.2 SSD module is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Align the M.2 SSD module at an angle with the connector on the BOSS N1 card.
2. Insert the M.2 SSD module until it is firmly seated in BOSS N1 card connector.
3. Using the Phillips 1 screwdriver, secure the M.2 SSD module on the BOSS N1 card with the screw.

ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
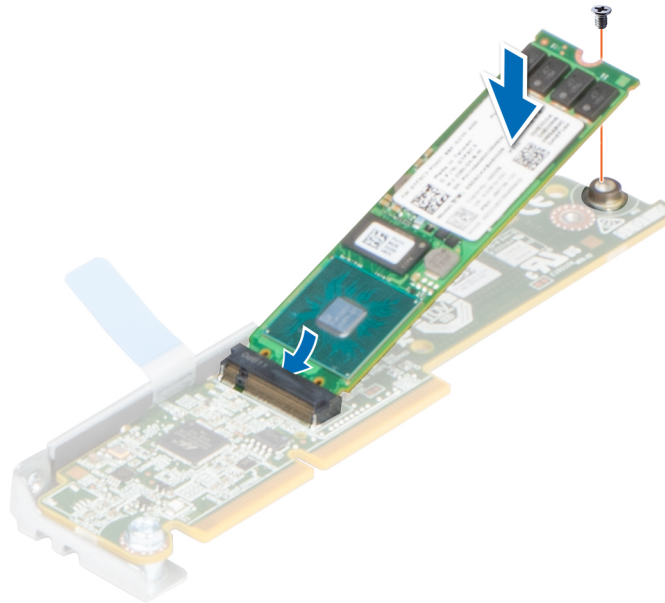
Figure 109. Installing the M.2 SSD module

Next steps

1. If applicable, replace the BOSS module.
2. Follow the procedure listed in the After working inside your system.

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.
3. Remove the BOSS N1 card.

ⓘ **NOTE:** The procedure to remove the system battery is the same for Rear Accessed and Front Accessed configurations.

Steps

1. To remove the battery:
   a. Push the battery holder clip away from the battery.

   ⚠ **CAUTION: To avoid damage to the battery holder clip, ensure that you do not bend the battery holder clip while installing or removing a battery.**

   b. Pull the battery out of the battery holder.
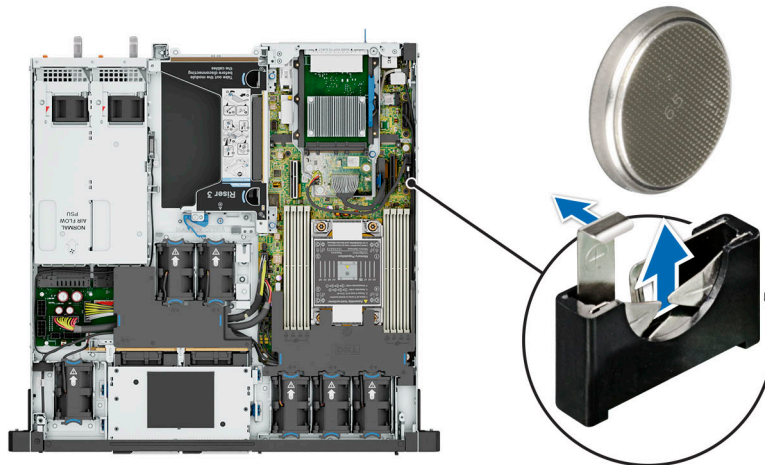
Figure 110. Removing the system battery

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

2. To install a new system battery:
   a. Push the battery holder clip away.

   ⓘ **NOTE:** Ensure that the **+** side of the battery is facing the battery holder clip.

   b. Insert the battery in the battery holder until the battery holder clip snaps into place.

   ⚠ **CAUTION: To avoid damage to the battery holder clip, ensure that you do not bend the battery holder clip while installing or removing a battery.**
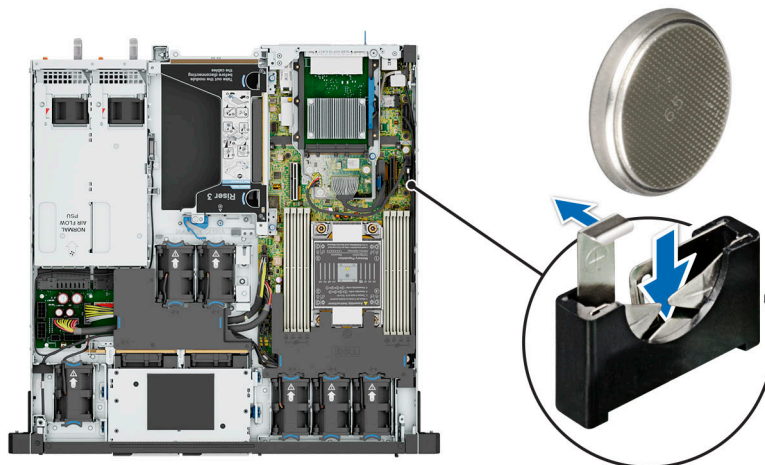
Figure 111. Installing the system battery

Next steps

1. If applicable, Install an expansion card into expansion card Riser 1
2. Install the expansion card riser 1.
3. Follow the procedure listed in the After working inside your system.
4. 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** System Setup.
   d. To test the newly installed battery, remove the system from the enclosure for at least an hour.

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

Power supply unit

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

ⓘ **NOTE:** For information about DC PSU cabling instructions, go to https://www.dell.com/poweredgemanuals > **Rack Servers** > PowerEdge XR5610 > **Select This Product** > **Documentation** > **Manuals and Documents** > *Cabling instructions for – 48 – 60 V DC power supply*.

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.

Removing a power supply unit blank

Prerequisites

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

ⓘ **NOTE:** The procedure to remove the power supply unit blank is the same for Rear Accessed and Front Accessed configurations.

Steps

Pull the blank out of the system.

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

ⓘ **NOTE:** You must install a power supply blank in a unused slot to maintain Federal Communications Commission (FCC) certification of the system. The blank also keeps dust and dirt out of the system and aids in proper cooling and airflow inside the system.
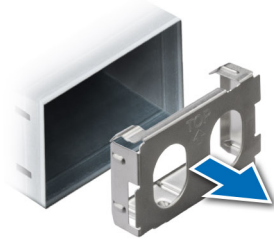
Figure 112. Removing a power supply unit blank

Next steps

Replace the PSU or PSU blank.

Installing a power supply unit blank

Prerequisites

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

(i) **NOTE:** The procedure to install the power supply unit (PSU) is the same for Rear Accessed and Front Accessed configurations.

(i) **NOTE:** Install the power supply unit (PSU) blank only in the second PSU bay.

Steps

Align the PSU blank with the PSU bay and push it into the PSU bay until it clicks into place.
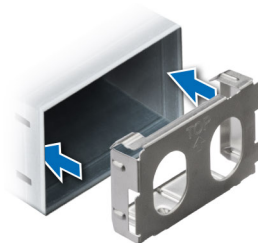
Figure 113. Installing a power supply unit blank

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 Power Supply Unit (PSU) you intend to remove.
3. Remove the cable from the strap on the PSU handle.
4. Unlatch and lift the optional cable management arm if it interferes with the PSU removal.

For information about the cable management arm, see the system's rack documentation at https://www.dell.com/poweredgemanuals.

(i) **NOTE:** The PowerEdge XR5610 has two types of Power Supply Units (PSUs). The PSUs with black straps are designed for Rear Accessed configuration while the PSUs with blue straps are designed for Front Accessed configuration.

Steps

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

Figure 114. Removing a power supply unit from Rear Accessed configuration
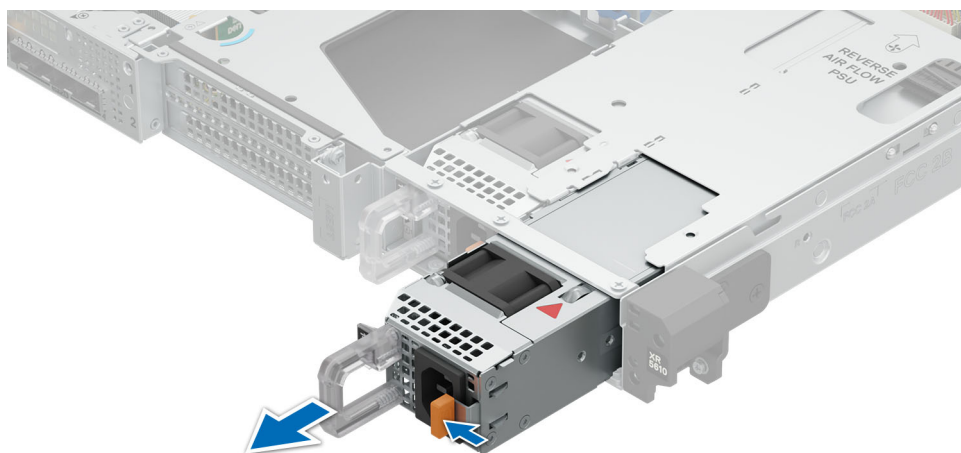
Figure 115. Removing a power supply unit from Front Accessed configuration

Next steps

Replace the PSU or replace the PSU blank.

Installing a power supply unit

Prerequisites

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

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

3. Remove the PSU blank.

   ⓘ **NOTE:** The PowerEdge XR5610 has two types of Power Supply Units (PSUs). The PSUs with black straps are designed for Rear Accessed configuration while the PSUs with blue straps are designed for Front Accessed configuration.

Steps

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

Figure 116. Installing a power supply unit for Rear Accessed configuration
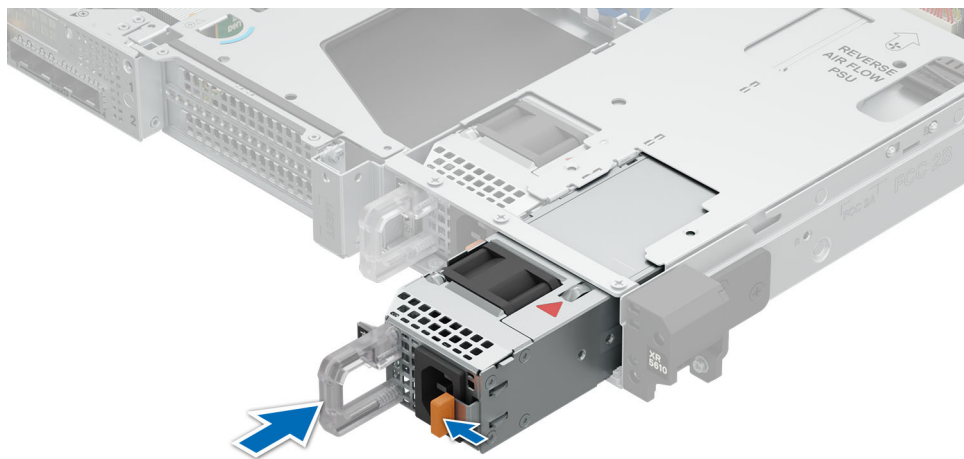
Figure 117. Installing a power supply unit for Front Accessed configuration

Next steps

1. If you have unlatched the cable management arm, relatch it. For information about the cable management arm, see the system's rack 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.

ⓘ **NOTE:** For certain premium configurations with high power consumption, system PSU might stay with 2+0 mode only, 1+1 redundant mode is not available.

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

Power distribution board

This is a service technician replaceable part only.

Removing power interposer board (PIB)

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 PCI air shroud.
4. Remove both PSUs.
5. Disconnect all the cables that are connected to the system board, intrusion switch, Fan1, Fan 2 and Fan 3 from the power interposer board (PIB).

ⓘ **NOTE:** The procedure to remove the power interposer board (PIB) is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Using a Phillips 2 screwdriver, remove the screws securing the power interposer board to the system.

ⓘ **NOTE:** Observe the routing of the cables as you remove them from the system.
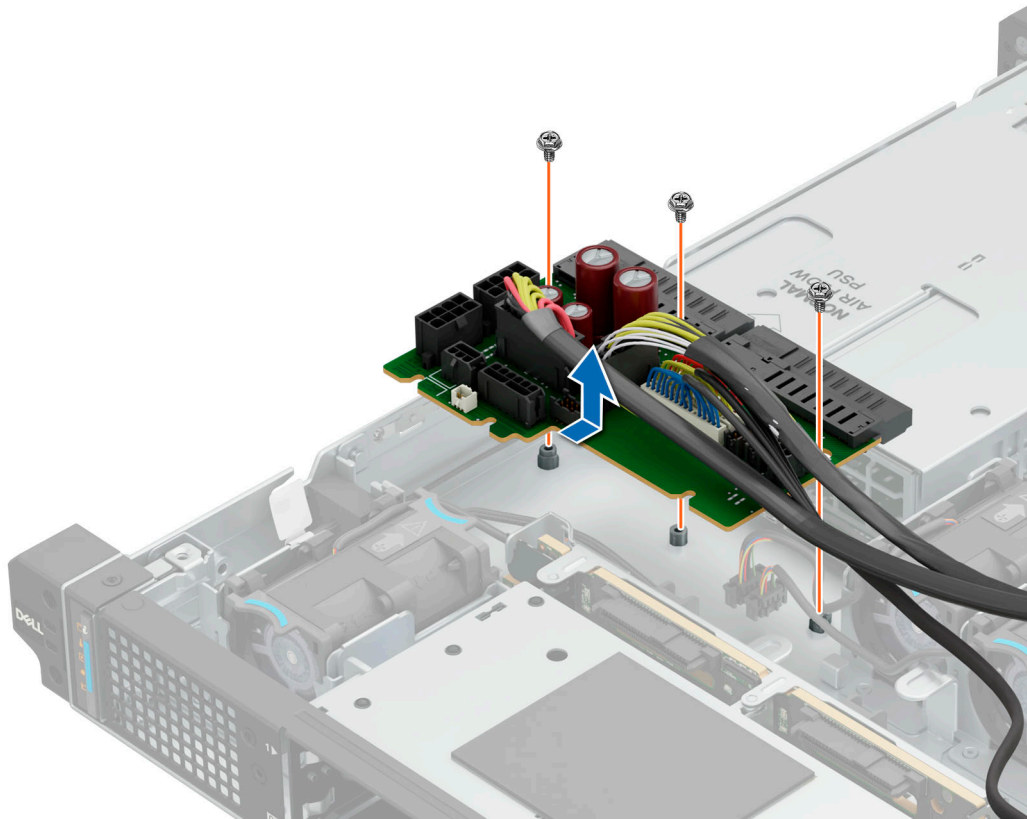
2. Lift the PIB away from the system.

Figure 118. Removing the power interposer board

Next steps

Replace the power interposer board.

Installing the power interposer board (PIB)

Prerequisites

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

ⓘ **NOTE:** The procedure to install the power interposer board (PIB) is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Align the slots on the PIB with the hook on the system and slide it into place.
2. Using Phillips 2 screwdriver, tighten the screws to secure the PIB to the system.
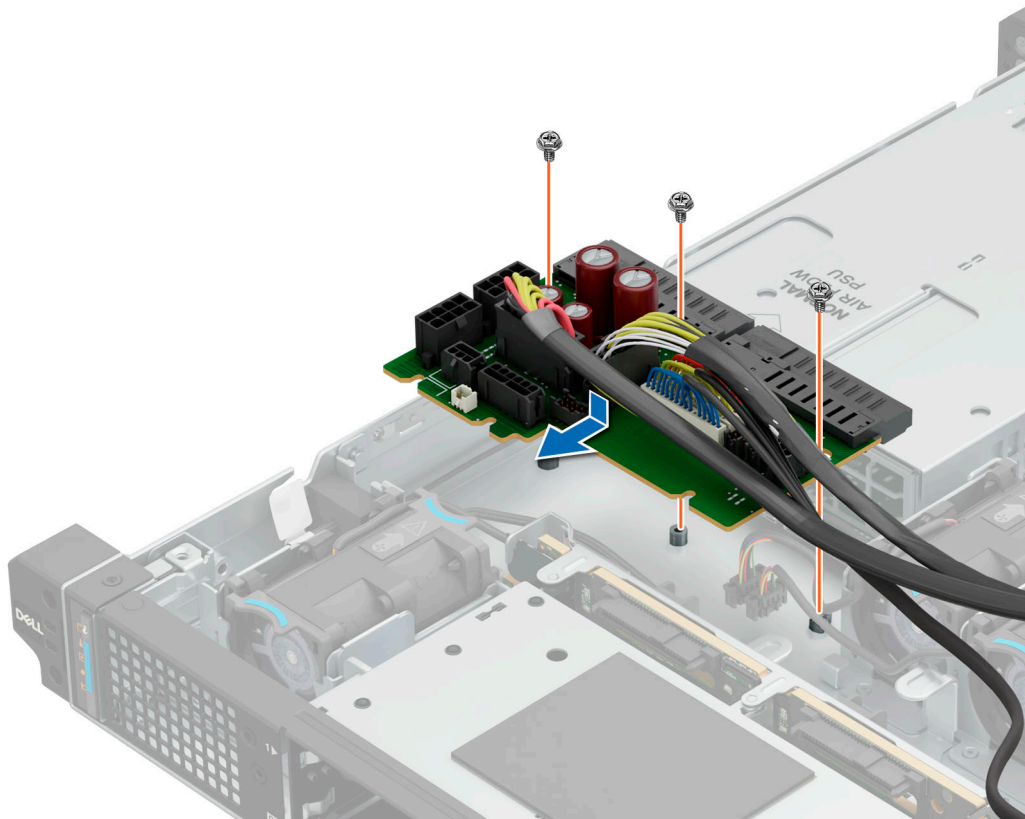
Figure 119. Installing the power interposer board

3. Reconnect all the required cables.

Next steps

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

Optional OCP card

Removing the OCP riser

Prerequisites

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

Steps

1. Using a Phillips 2 screwdriver, loosen the captive screw and the two screws on the chassis.
2. Disconnect the signal cable and power cable from the system board connectors.
3. Lift the OCP riser from the OCP riser slot.

   (i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
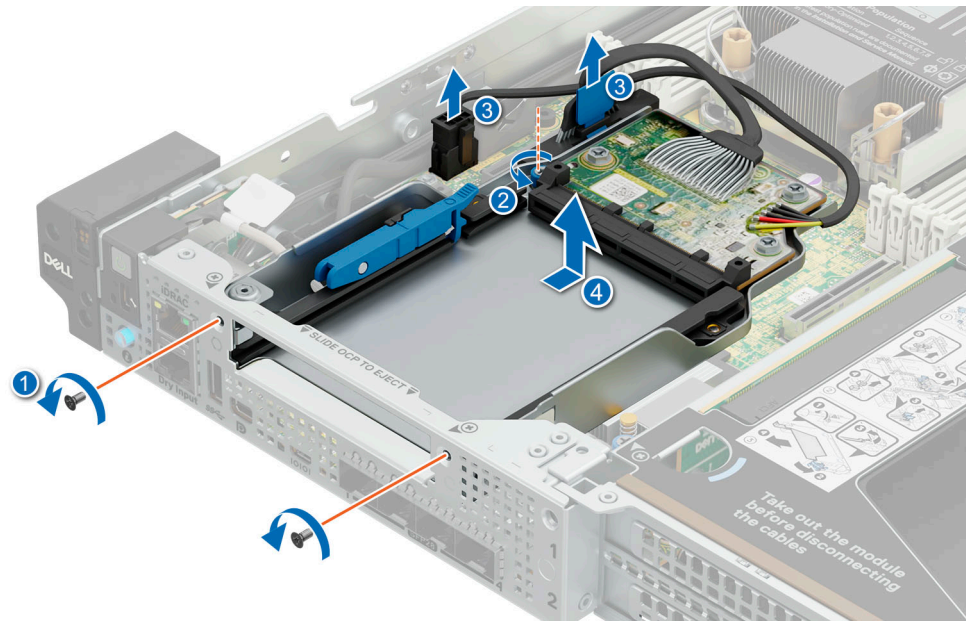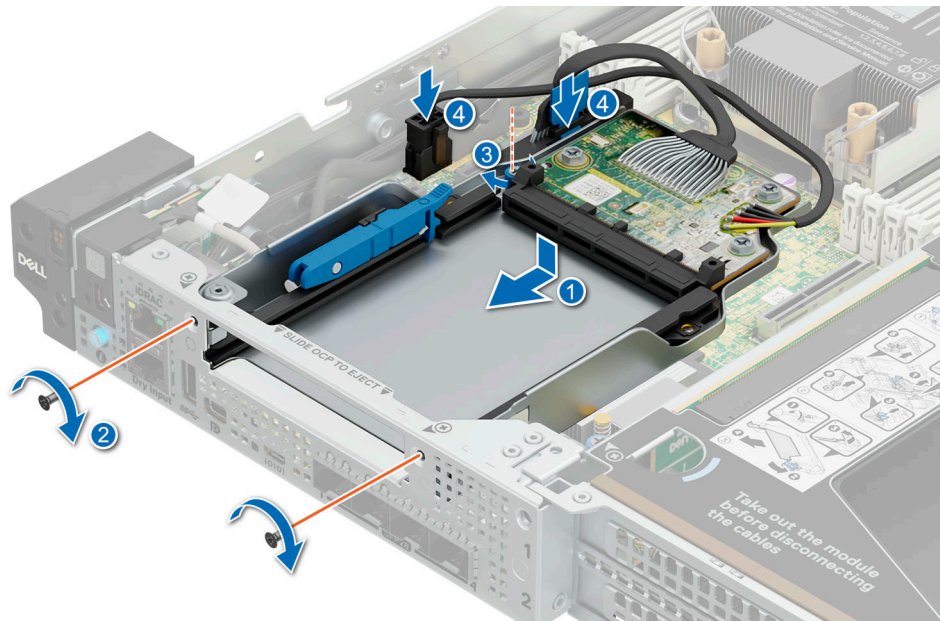
Figure 120. Removing the OCP riser

Next steps

Replace the OCP riser.

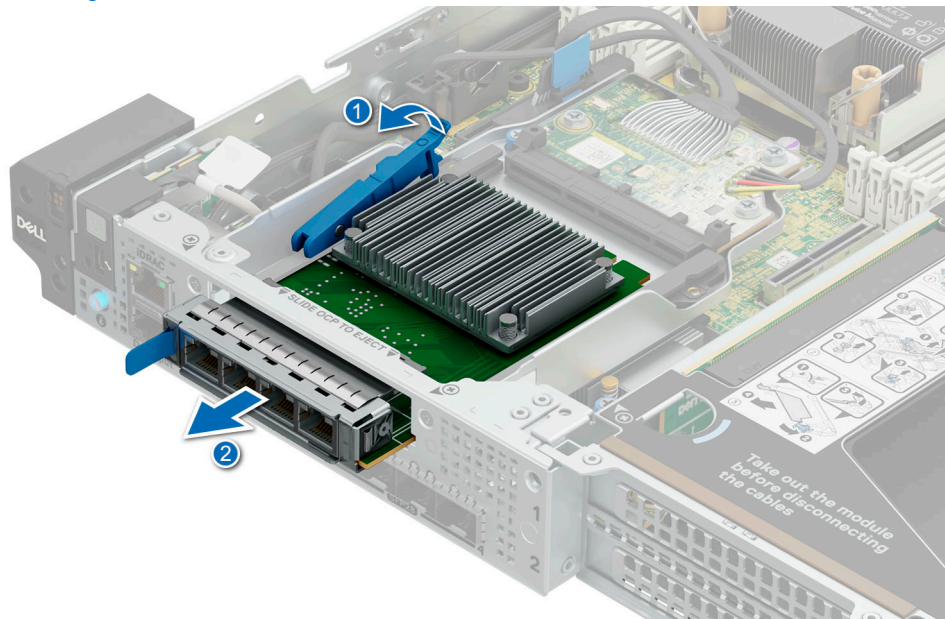# Installing the OCP riser

Prerequisites

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

Steps

1. Slide the OCP riser into the OCP riser slot. Using a Phillips 2 screwdriver, tighten the captive screw and the two screws on the chassis to secure the OCP riser in place.
2. Connect the signal cable and power cable on the system board connectors.

Figure 121. Installing the OCP riser

Next steps

1. Install the OCP card.
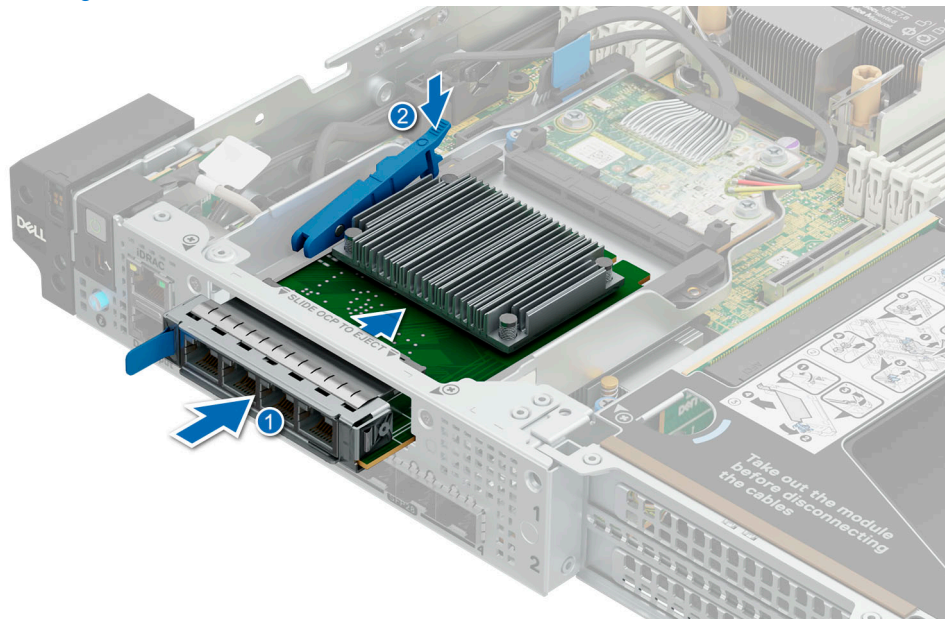2. Follow the procedure listed in After working inside your system.

Removing an OCP card

Prerequisites

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

Steps

Lift the blue retention latch lock to release the OCP card. Slide the OCP card out from the OCP riser.

Figure 122. Removing an OCP

card

Next steps

1. Install the OCP filler.

Installing an OCP card

Prerequisites

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

Steps

Slide the OCP card into the OCP riser until it is firmly connected. Press down the blue retention latch lock to secure the OCP card in place.

Figure 123. Installing an OCP

card

Next steps

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

Removing the OCP filler

Prerequisites

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

Steps

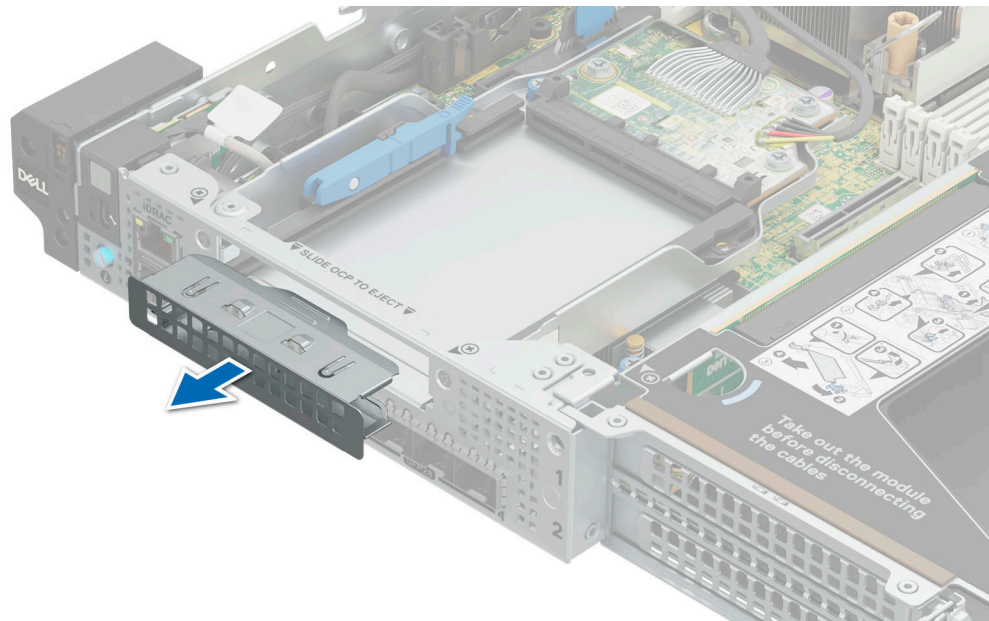Hold and slide the OCP filler out from the OCP slot on the chassis.

Figure 124. Removing the OCP card filler

Next steps

1. Install the OCP card.

Installing the OCP card filler

Prerequisites

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

Steps

Align and insert the OCP filler firmly until it is fully seated.

Figure 125. Installing the OCP card
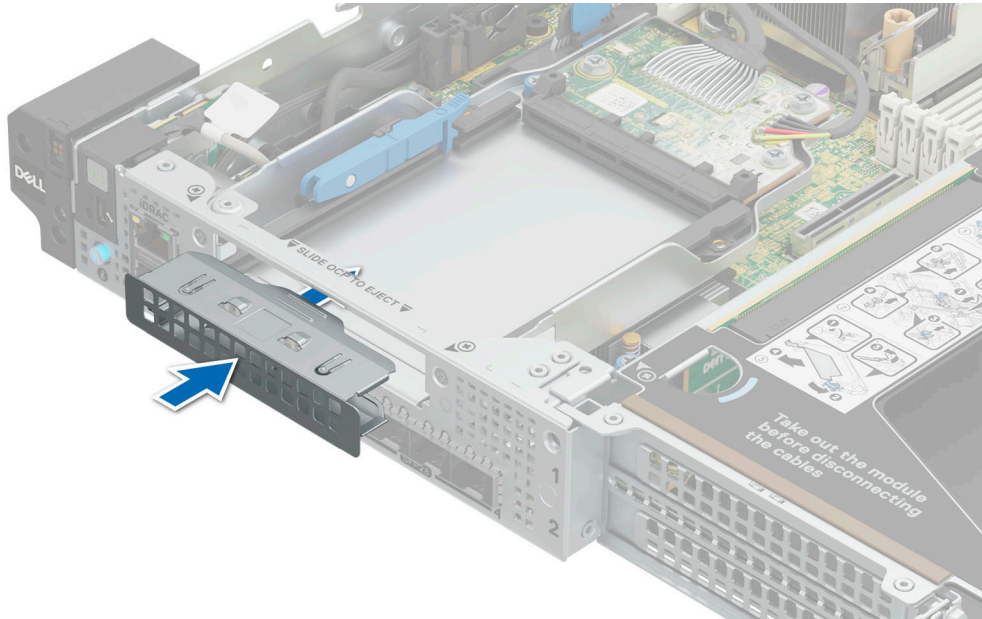
filler

Next steps

1. Install the system cover.

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. System cover
   b. Expansion card risers
   c. Air shrouds
   d. Memory modules
   e. Processor and heat sink module
   f. BOSS N1 card
   g. OCP riser
   h. Disconnect all cables from the system board.
      > ⚠ **CAUTION: Take care not to damage the system identification button while removing the system board from the system.**

> ⓘ **NOTE:** The procedure to remove the system board is the same for Rear Accessed and Front Accessed configurations.

Steps

1. Using a Phillips 2 screwdriver, remove the screws that secure the system board to the system.
2. Hold the system board by the edges and slide it towards the fan modules. Lift the system board out of the system.
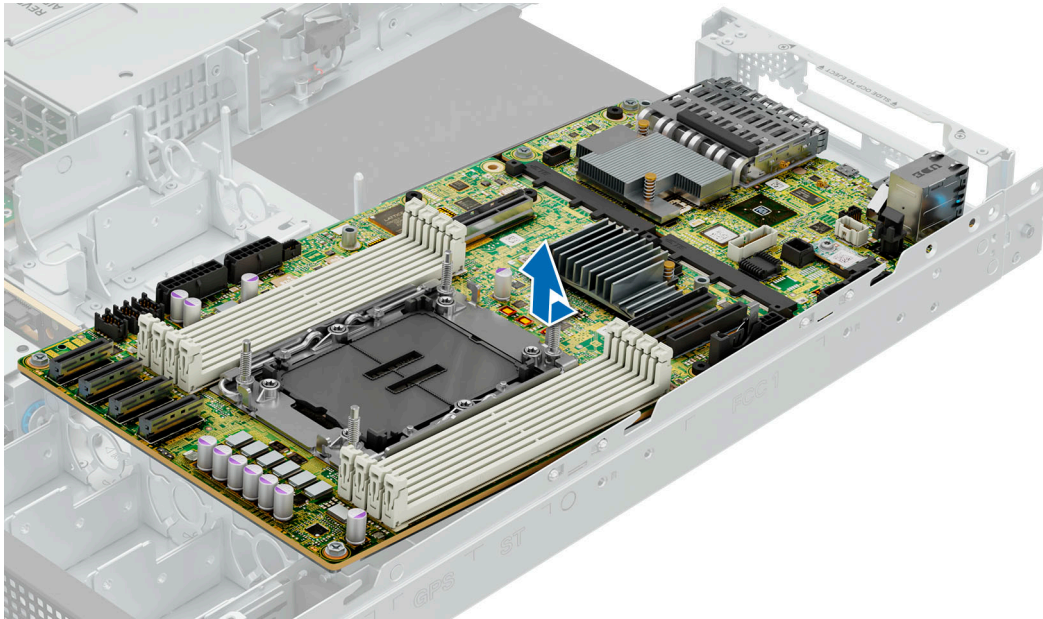

Figure 126. Removing the system board

Next steps

Install the system board.

Installing system board

Prerequisites

(i) **NOTE:** Before replacing the system board, replace the old iDRAC MAC address label in 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 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.

(i) **NOTE:** The procedure to install the system board is the same for Rear Accessed and Front Accessed configurations.

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.**

(i) **NOTE:** Do not remove the processor socket cover until the system board is assembled in the system and ready for installation of the processor and heat sink module.

2. Holding the system board by the edges, lower the system board it into the system.
3. Align the connectors on the system board with the slots on the rear of the system until the connectors are firmly seated in the slots.
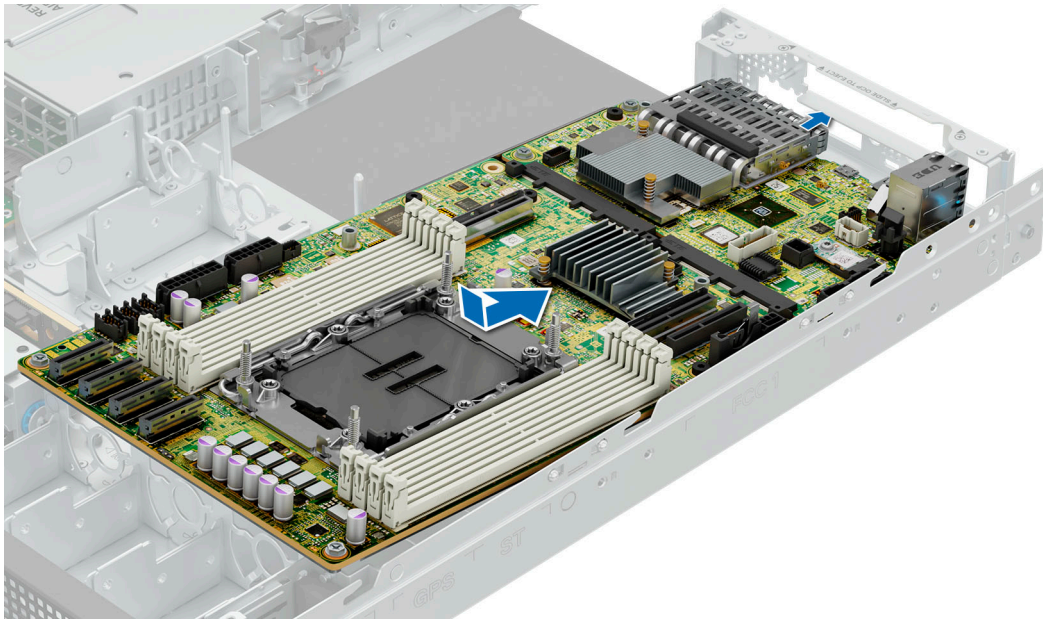
Figure 127. Installing the system board

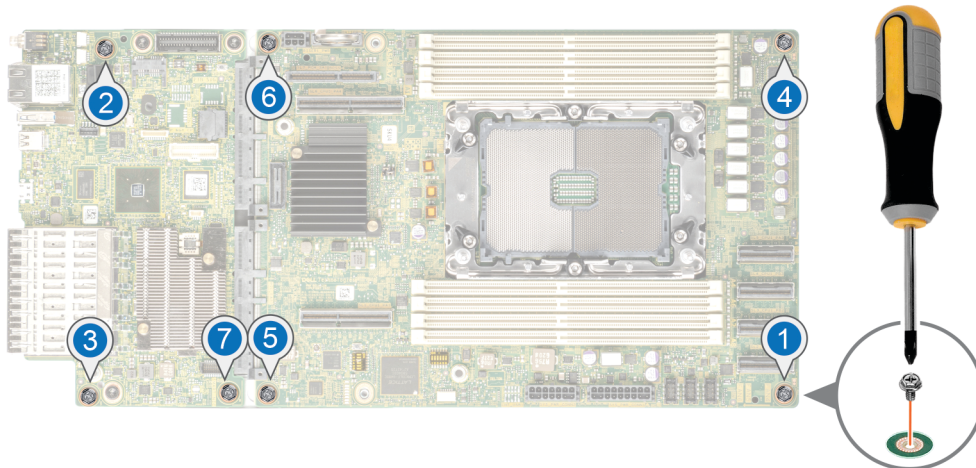4. Using a Phillips 2 screwdriver, tighten the screws sequentially and secure the system board to the chassis.

Figure 128. System board screw fastening sequence

Next steps

1. Reconnect all cables to the system board.

   (i) **NOTE:** Ensure that the cables inside the system are routed along the chassis wall and secured using the cable securing brackets.

2. Replace the following components:

   a. Trusted Platform Module (TPM)

      (i) **NOTE:** The TPM Module must be replaced only while installing a new system board.

   b. Processor and heat sink module
   c. BOSS N1 card
   d. Memory modules
   e. OCP riser
   f. Reconnect all cables to the system board.

      (i) **NOTE:** Ensure that the cables inside the system are routed along the chassis wall and secured using the cable securing brackets.

    g. Expansion card risers

    h. Air shrouds

    i. System cover

3. Ensure that you perform the following steps:

    a. Use the Easy Restore feature to restore the Service Tag. See the Restoring the system by using the Easy Restore feature section.

    b. If the service tag is not backed up in the backup flash device, enter the system service tag manually. See the Manually update the Service Tag using System Setup section.

    c. Update the BIOS and iDRAC versions.

       Re-enable the Trusted Platform Module (TPM). See the Upgrading the Trusted Platform Module section.

4. 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..

5. 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**.

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.
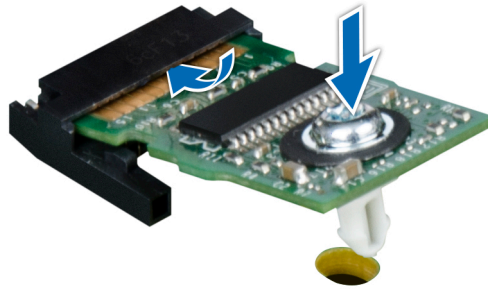4. Replace the screw that secures the TPM to the system board.

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 1.2 for users

Steps

1. While booting your system, press F2 to enter System Setup.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
3. From the **TPM Security** option, select **On with Preboot Measurements**.
4. From the **TPM Command** option, select **Activate**.
5. Save the settings.
6. Restart your system.

Initializing the TPM 2.0 for users

Steps

1. While booting your system, press F2 to enter System Setup.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
3. From the **TPM Security** option, select **On**.
4. Save the settings.
5. Restart your system.

Control panel

This is a service technician replaceable part only.

Removing the status LED control panel for Rear Accessed configuration

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 shrouds.
4. Remove the expansion card riser 1.

ⓘ **NOTE:** If necessary, remove the backplane signal and power cables.

Steps

1. Using the Phillips 2 screwdriver, remove the screws that secure the left ear handle.
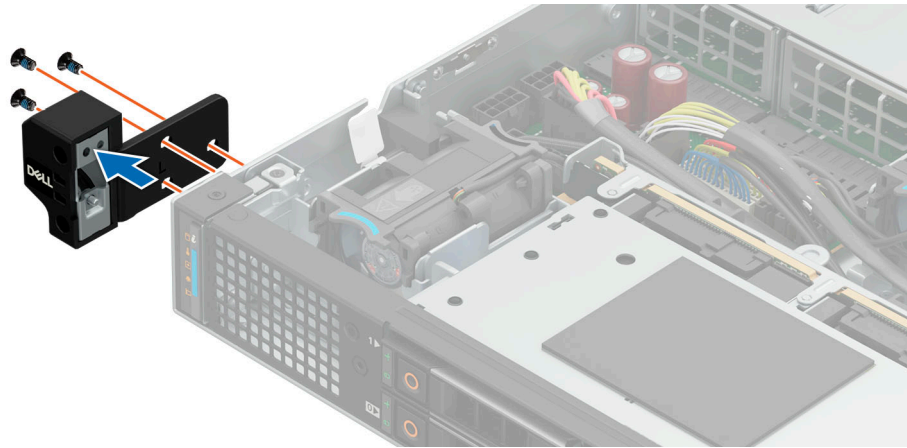

Figure 130. Removing the left ear handle of the Rear Accessed configuration
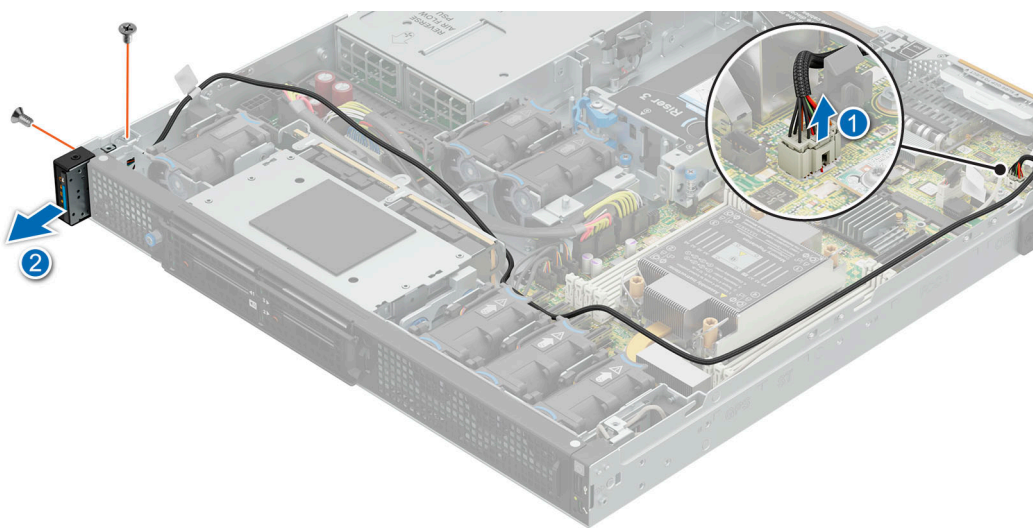

Figure 131. Removing the status LED control panel for Rear Accessed configuration

2. Disconnect the status LED control panel cable from the system board connector.

> (i) **NOTE:** Observe the routing of the cable as you remove it from the system.

3. Using the Torx 8 screwdriver, remove the screws that secure the status LED control panel to the system.
4. Hold the status LED control panel and remove the control panel along with the cable from the system.

> (i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.

Next steps

Replace the status LED control panel for Rear Accessed configuration.

Installing the status LED control panel for Rear Accessed configuration

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 shrouds.
4. Remove the expansion card riser 1.

> (i) **NOTE:** If necessary, please remove the backplane signal and power cables.

Steps

1. Align and insert the status LED control panel assembly in the slot on the system.
2. Route the status LED control panel cable through the guide slots in the system and connector on the system board.

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

3. Using the Torx 8 screwdriver, tighten the screws that secure the left control panel assembly to the system.

> (i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
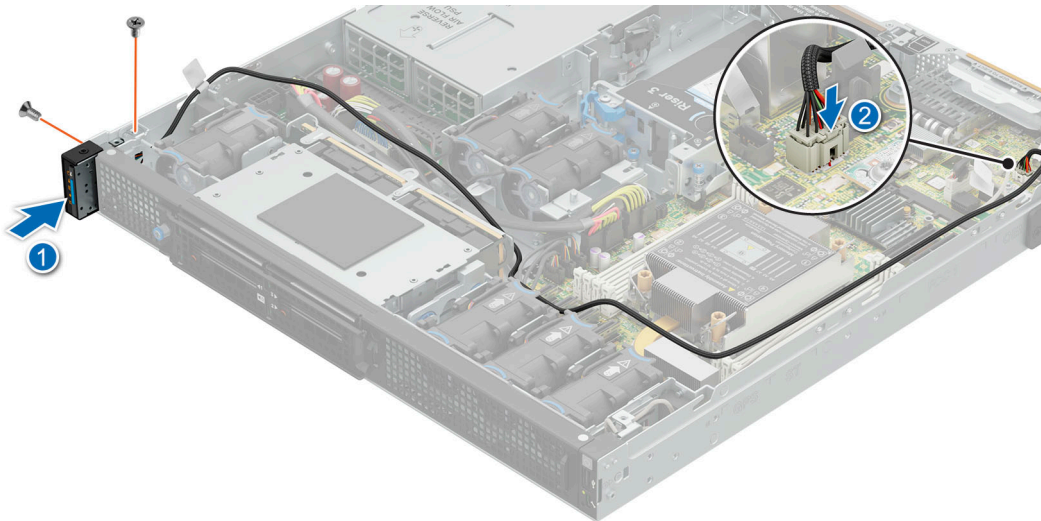

Figure 132. Installing the status LED control panel for Rear Accessed configuration

4. Align and insert the left ear handle in the slot on the system and tighten the screws using Torx 8 screwdriver.
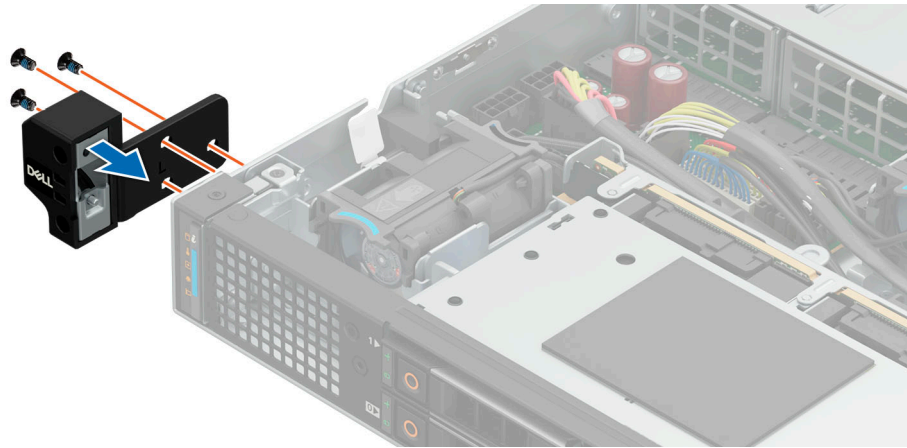
Figure 133. Installing the left ear handle for Rear Accessed configuration

Next steps

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

Removing the status LED control panel for Front Accessed configuration

Prerequisites

ⓘ **NOTE:** For Front Accessed configuration, the status LED control panel is on the rear of the system.

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 shrouds.
4. Remove the expansion card riser 1.

ⓘ **NOTE:** If required, remove the backplane power and signal cables.

Steps

1. Disconnect the status LED control panel cable from the system board connector.

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

2. Using the Torx 8 screwdriver, remove the screws that secure the status LED control panel assembly to the system.
3. Hold the left status LED control panel assembly and remove the control panel along with the cable from the system.

   ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
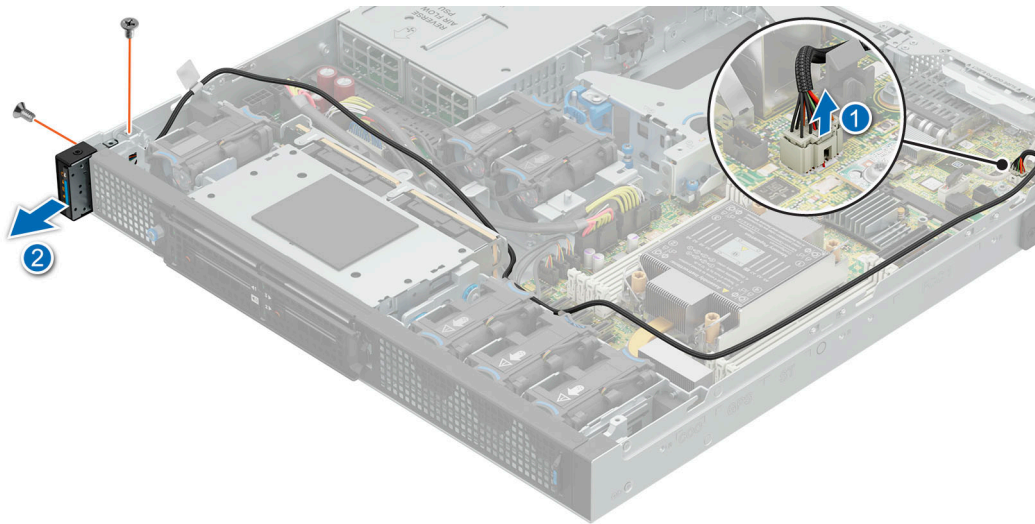
Figure 134. Removing the status LED control panel for Front Accessed configuration

Next steps

Replace the status LED control panel for Front Accessed configuration.

Installing the status LED control panel for Front Accessed configuration

Prerequisites

ⓘ **NOTE:** For Front Accessed configuration, the status LED control panel is on the rear of the system.

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 shrouds.
4. Remove the expansion card riser 1.

ⓘ **NOTE:** If required, remove the backplane power and signal cables.

Steps

1. Align and insert the status LED control panel assembly in the slot on the system.
2. Route the status LED control panel cable through the guide slots in the system and connector on system board.

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

3. Using the Phillips 1 screwdriver, tighten the screws that secure the status LED control panel assembly to the system.

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

    ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
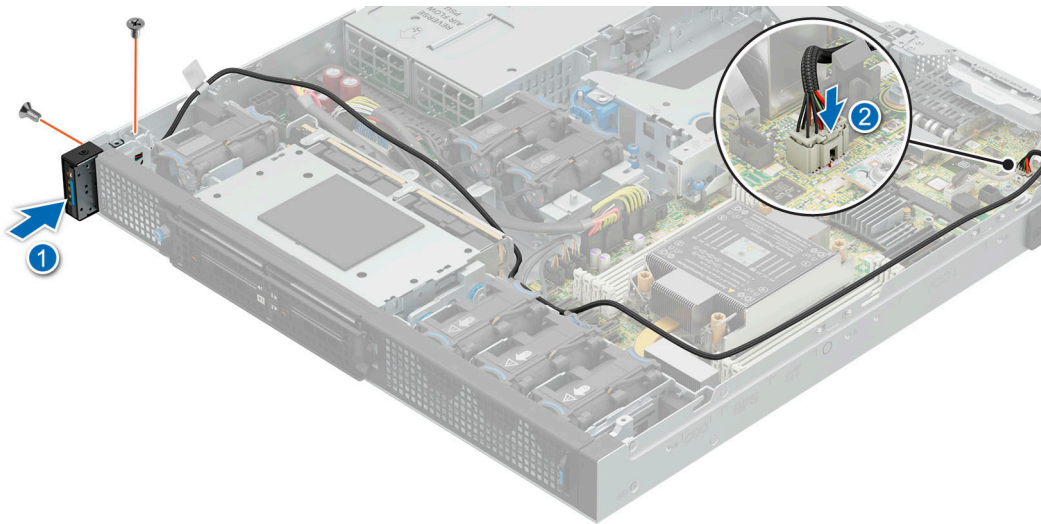
Figure 135. Installing the status LED control panel assembly for Front Accessed configuration

Next steps

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

Removing the power button control panel for Rear Accessed configuration

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 processor air shroud.
4. Remove the expansion card riser 1.

Steps

1. Using the Phillips 2 screwdriver, remove the screws that secure the right ear handle.
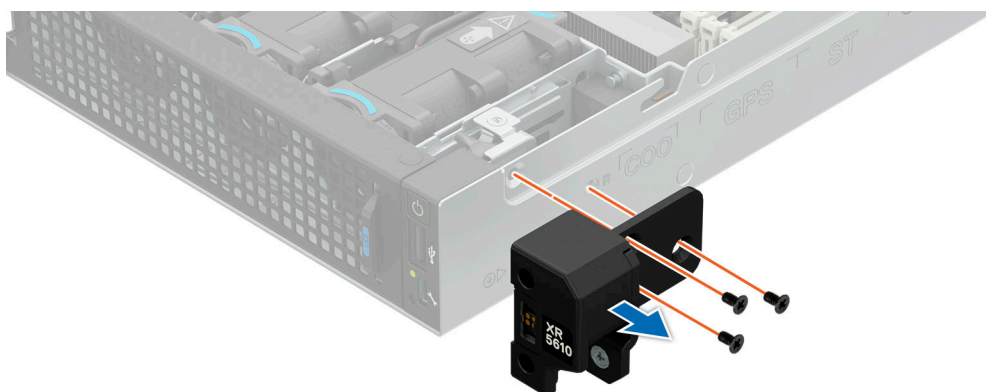

Figure 136. Removing the right ear handle for Rear Accessed configuration

2. Disconnect the power button control panel cable from the system board connector and remove the cable from cable clip.

(i) **NOTE:** Observe the routing of the cable as you remove it from the system.

3. Using the Torx 8 screwdriver, remove the screws that secure the right control panel assembly.
4. Hold the power button control panel assembly and remove the control panel along with the cable from the system.

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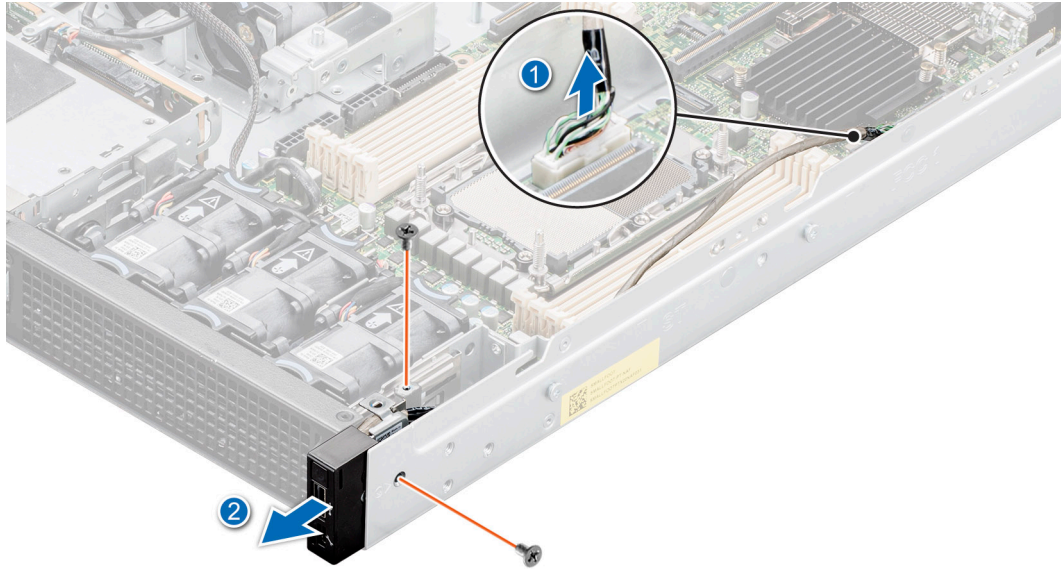

Figure 137. Removing the power button control panel for Rear Accessed configuration

Next steps

Replace the power button control panel.

Installing the power button control panel for Rear Accessed configuration

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 shrouds.
4. Remove the expansion card riser 1.

Steps

1. Route the power button control panel cable through the side wall of the system.

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

2. Align and insert the right control panel in the slot on the system.
3. Connect the power button control panel cable to the connector on the system board.
4. Using the Torx 8 screwdriver, tighten the screws that secure the right control panel to the system.

(i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
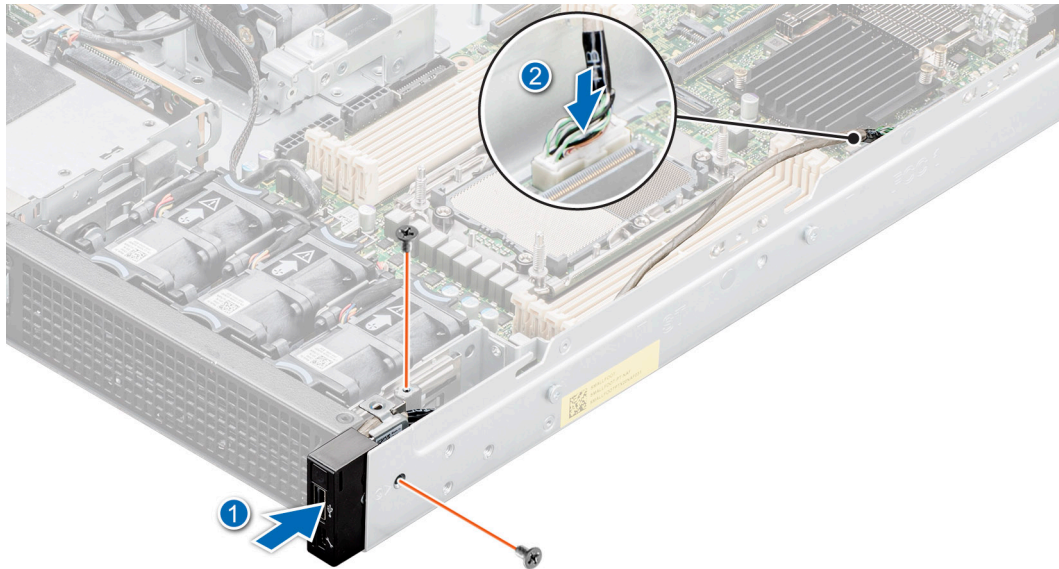
Figure 138. Installing the power button control panel for Rear Accessed configuration

5. Using the Phillips 2 screwdriver, tighten the screws that secure the right ear handle to the system.

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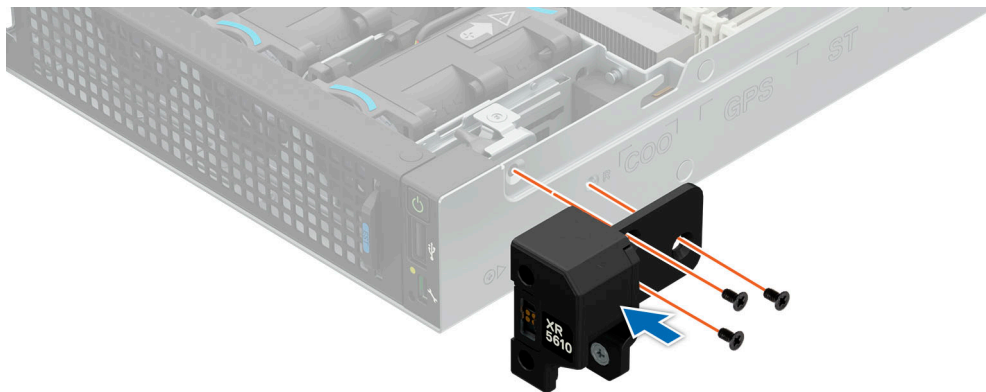

Figure 139. Installing the right ear handle for Rear Accessed configuration

Next steps

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

Removing the power button control panel for Front Accessed configuration

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 Riser 1.

Steps

1. Loosen the three screws to remove the left ear for the Front Accessed configuration.
2. Disconnect the power button control panel cable from the system board connector and remove the cable from cable clip.

   (i) **NOTE:** Observe the routing of the cable as you remove it from the system.

3. Using the Phillips 2 screwdriver, remove the screws that secure the left rack ear.
4. Using the Torx 8 screwdriver, remove the screws that secure the power button control panel assembly.
5. Hold the power button control panel assembly and remove the control panel along with the cable from the system.

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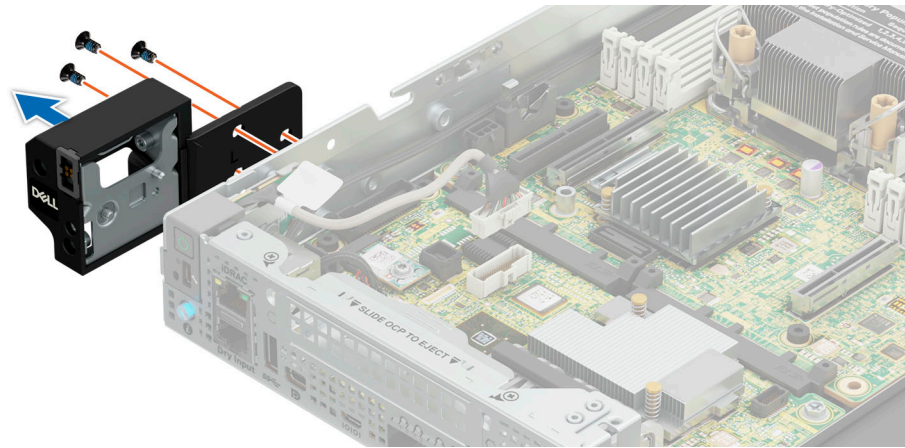

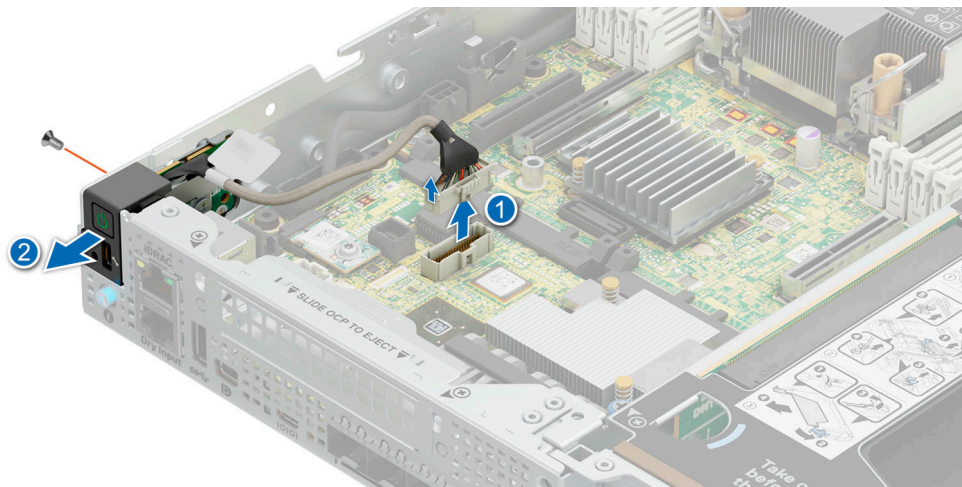**Figure 140. Removing the left ear for the Front Accessed configuration**

Figure 141. Removing the power button control panel for Front Accessed configuration

Next steps

Replace the power button control panel for Front Accessed configuration.

Installing the power button control panel for Front Accessed configuration

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 1.

Steps

1. Align and insert the power button control panel in the slot on the system.
2. Route the power button control panel cable through the side wall of the system.

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

3. Connect the power button control panel cable to the connector on the system board.
4. Using the Torx 8 screwdriver, tighten the screws that secure the power button control panel to the system.

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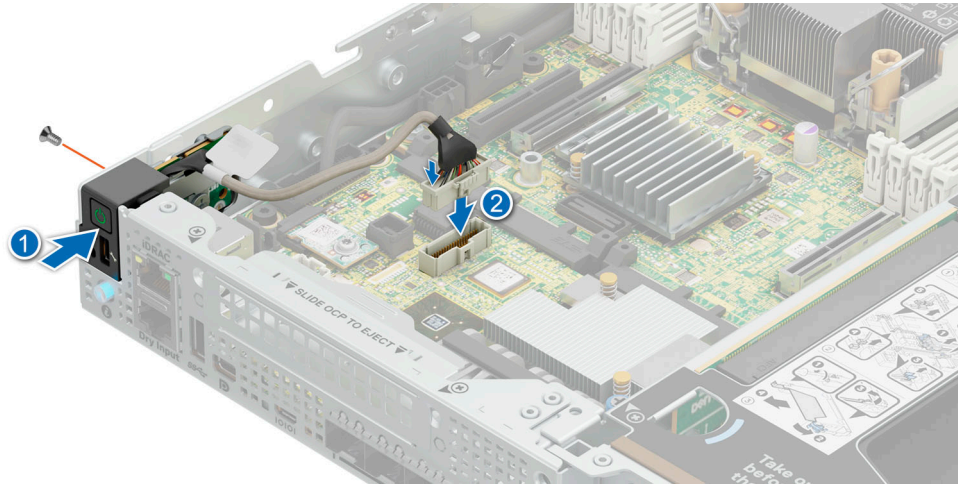

Figure 142. Installing the power button control panel for Front Accessed configuration
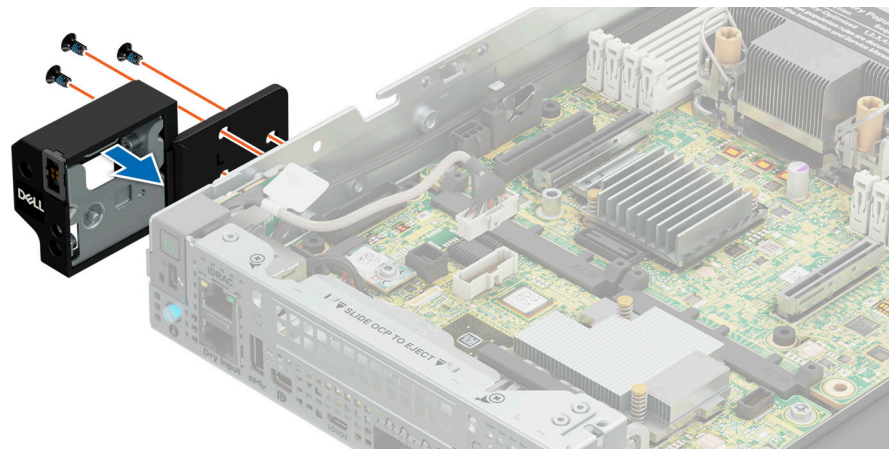

Figure 143. Installing the left ear for the Front Accessed configuration

5. Using the Phillips 2 screwdriver, tighten the screws and secure the rack left ear.

Next steps

1. Install the expansion card riser 1.
2. Follow the procedure listed in the After working inside your system.

Ruggedization Kit

The Ruggedization Kit provides rugged protection for the PowerEdge XR5610 server. The Ruggedization Kit consists of the components that are mentioned below:

- PCIe card holder
  (i) **NOTE:** Only compatible with the new riser released in December 2023. The older version of riser does not support the PCIe card holder.
- Power supply rugged bracket
- Drive rugged bracket.
- Screw sets

Topics:

- Ruggedization Kit

Ruggedization Kit

Prerequisites

(i) **NOTE:** The Ruggedization Kit is ordered as Drop In Box (DIP) from Dell.

1. Follow the safety guidelines listed in Safety instructions.
2. Unpack the Ruggedization Kit rugged brackets.
3. Remove the front bezel for Rear Accessed configuration.

Steps

1. Align the right edge of the drive retention bracket to the guide slots on the right side of the drive module. Using a Phillips 2 screwdriver, secure the Ruggedization Kit drive rugged bracket.
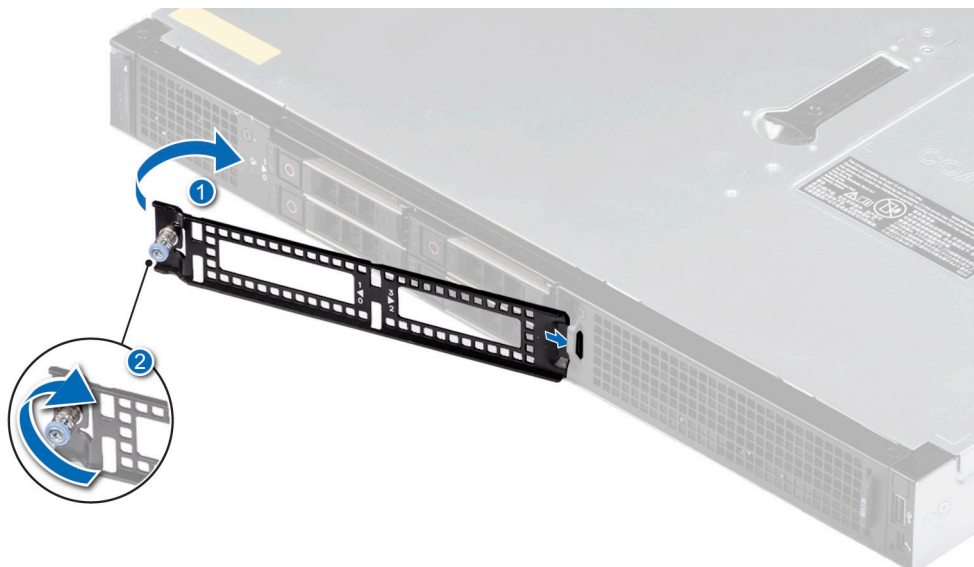

Figure 144. Installing the Ruggedization Kit drive rugged bracket

2. Install the front bezel for Rear Accessed configuration.
3. Align the power supply bracket to the rear of the power supply cage and slide it in place. Using a Phillips 2 screwdriver, tighten the screws to secure the bracket.
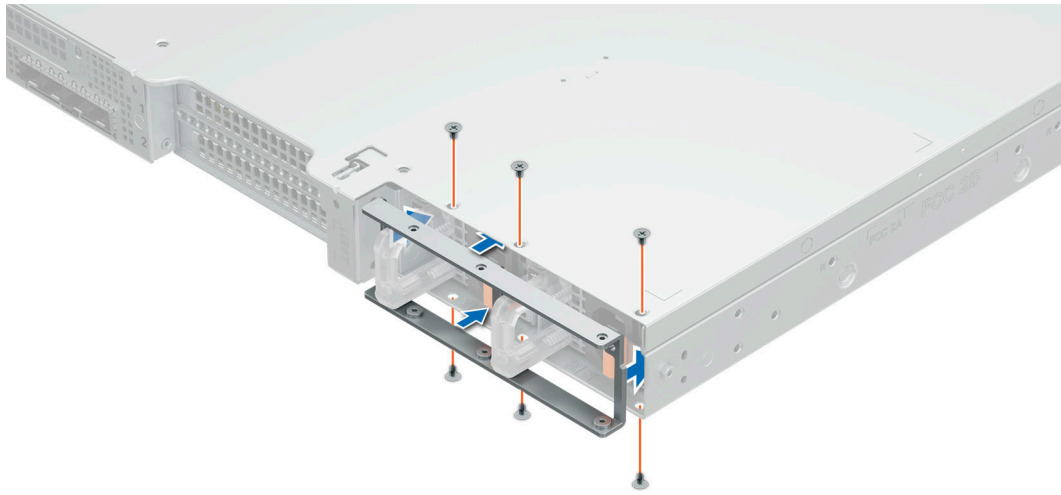
Figure 145. Installing the power supply rugged bracket

4. Align the tabs on the system cover with the guide slots on the system.
5. Close the system cover release latch.
6. Using a 1/4-inch flat head or Phillips 2 screwdriver, rotate the lock clockwise to the lock position.
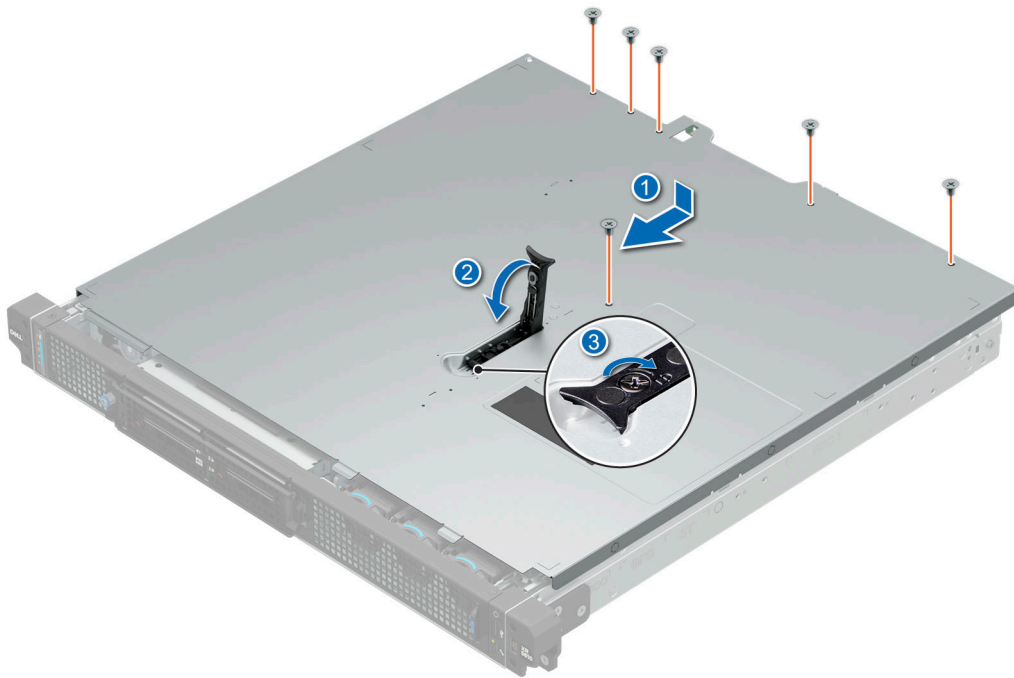
Figure 146. Installing the system cover

7. Release the two card latches. Align the card holder into the riser cage. Secure the card holder by securing the two card latches and the screw.

   ⓘ **NOTE:** PCIe card holders are only compatible with new PCIe risers released since December 2023. Older versions of risers do not require the PCIe card holder.

Figure 147. Installing the riser card holder

Next steps

Follow the procedure listed in After working inside 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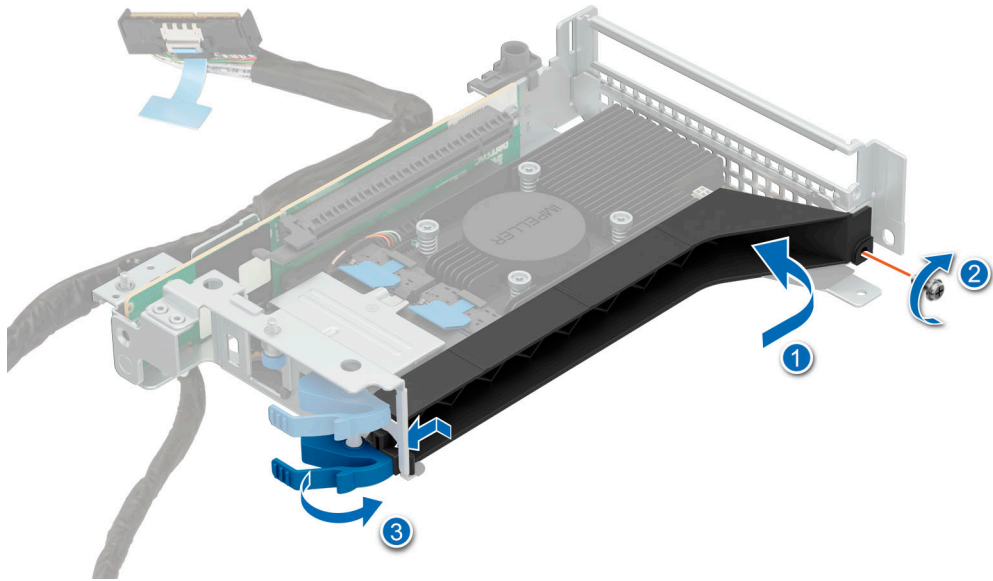 system board help to disable the system and reset the passwords. To install components and cables correctly, you must know the connectors on the system board.

Topics:

- System board jumpers and connectors
- System board jumper settings
- Disabling a forgotten password

System board jumpers and connectors

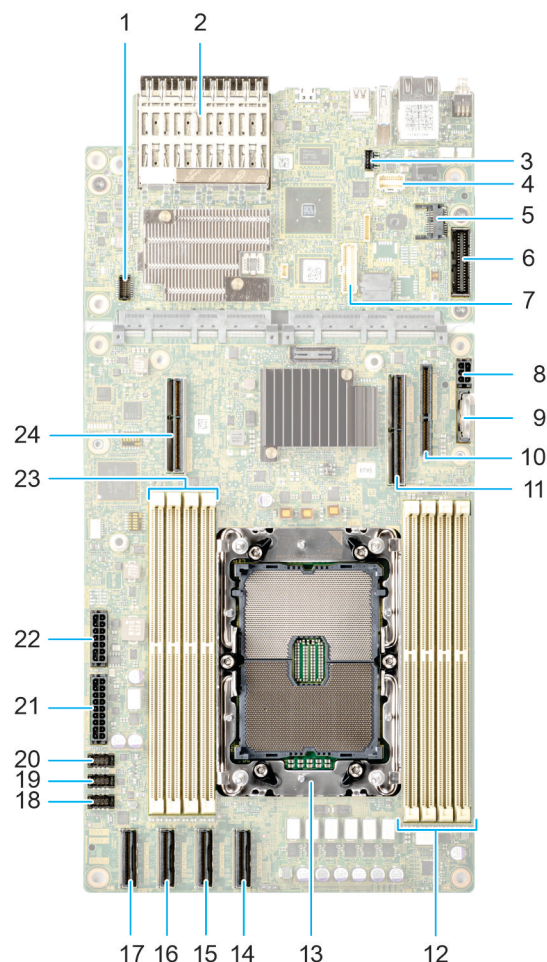**Figure 148. System board connectors**

Table 104. System board connectors description

| Item	Connector	Description
1	NCSI connector	Network Communication Services Interface connector

Table 104. System board connectors description (continued)

Item	Connector	Description
2	25 GbE LOM (4)	25 GbE network connectors
3	POGO connector	POGO connector
4	J_LFT_CP1	Left control panel
5	TPM	TPM connector
6	PIB_SIG1	Power Interposer Board (PIB) connector
7	J_RGT_CP	Right control panel
8	RISER1_PWR	Riser 1 power connector
9	Coin cell battery	Coin cell battery
10	SL7_PCH_SA1	BOSS N1 connector
11	SL6_CPU1_PA4	Riser 1 connector
12	A5, A3, A7, A1	DIMM slots (A5, A3, A7, A1)
13	CPU	Processor socket
14	SL5_CPU1_PA3	PCIe cable connector
15	SL4_CPU1_PB3	PCIe cable connector
16	SL3_CPU1_PB2	PCIe cable connector
17	SL2_CPU1_PA2	PCIe cable connector
18	Fan 4	Fan 4 connector
19	Fan 5	Fan 5 connector
20	Fan 6	Fan 6 connector
21	SYS_PWR1	System power connection 1
22	SYS_PWR2	System power connection 2
23	A4, A6, A2, A8	DIMM slots (A4, A6, A2, A8)
24	SL1_CPU1_PA1	Riser 3 connector

System board jumper settings

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

Table 105. 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:

- Power button LED
- Bezel LED
- Status LED indicators
- System health and system ID indicator codes
- iDRAC Direct LED indicator codes
- NIC indicator codes
- Power supply unit indicator codes
- Drive indicator codes
- Using system diagnostics

Power button LED

The power button LED is located on the front panel of the Rear Accessed configuration system and on the rear of the Front Accessed configuration system.

Figure 149. Power button LED of the Rear Accessed configuration

Figure 150. Power button LED of the Front Accessed configuration

Table 106. Power button LED description

Power button LED indicator code	Condition
Off	System is not operating, regardless of power supply available.
On	System is operating, one or more of the non-standby power supply units are active.
Slowly blinking	System is performing powering on sequence and iDRAC is still booting.

Bezel LED

The bezel status LED is located on the front panel of the Rear and Front Accessed configuration system.
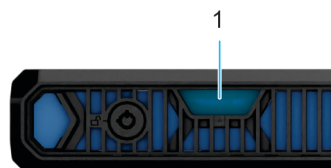

Figure 151. Bezel LED

1. Bezel LED

Table 107. Bezel LED description

Power button LED indicator code	Condition
LED off	System is off, no errors, and system ID mode is not active.
Solid blue	System is on, no errors, and system ID mode is not active.
Blinking amber (2 seconds on, 1 second off)	There are active errors present. This mode supersedes all states listed above and can be active when the system is on or off.
Blinking blue (0.5 Hz = 1 second on, 1 second off)	System ID mode is active. This mode supersedes all states listed above and can be active when the system is on or off.

Status LED indicators

> (i) **NOTE:** The indicators display solid amber if any error occurs.

Figure 152. Status LED indicators

Table 108. 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.

Table 108. Status LED indicators and descriptions (continued)

Icon	Description	Condition	Corrective action
⚡	Electrical indicator	The indicator turns solid amber if the system experiences an electrical error (for example, voltage out of range, or a failed power supply unit (PSU) or voltage regulator).	Check the System Event Log or system messages for the specific issue. If it is due to a problem with the PSU, check the LED on the PSU. Reseat the PSU. 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 section.

ⓘ **NOTE:** The system health and ID indicator is located at the front of the Rear Accessed configuration next to the left ear and it is located at the rear left of the Front Accessed configuration. See the front view and rear view of the system to identify the location.

System health and system ID indicator codes

The system health and system ID indicator is located on the system for Rear Accessed configuration and control panel of the system for Front Accessed configuration.
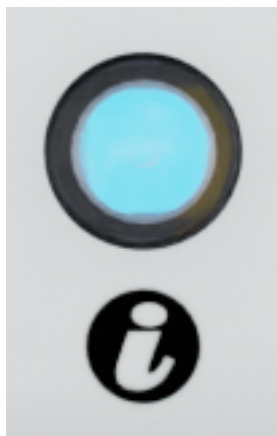
Figure 153. System health and system ID indicator

Table 109. 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.

Table 109. System health and system ID indicator codes (continued)

System health and system ID indicator code	Condition
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**.

ⓘ **NOTE:** The system health and ID indicator is located at the front of the Rear Accessed configuration next to the left ear and it is located at the rear left of the Front Accessed configuration. See the front view and rear view of the system to identify the location.

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 110. 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.

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.
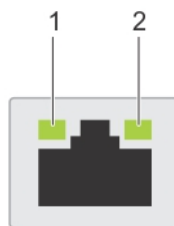
Figure 154. NIC indicator codes

1. Link LED indicator
2. Activity LED indicator

Table 111. 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.

Table 111. NIC indicator codes (continued)

NIC indicator codes	Condition
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.
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.
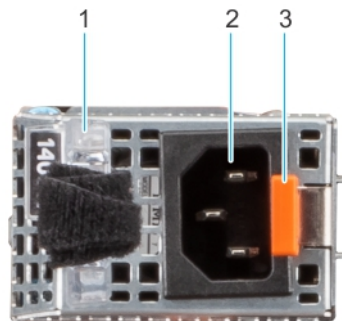

Figure 155. Rear Accessed configuration power supply

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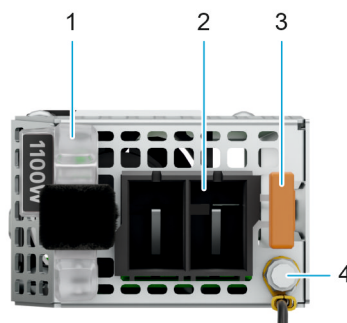2. Socket
3. Release latch

Figure 156. Front Accessed configuration DC power supply

1. DC PSU handle
2. DC socket
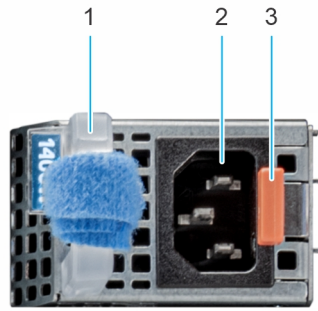3. Release latch
4. Grounding post

Figure 157. Front Accessed configuration AC power supply

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

Table 112. AC and 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	Indicates that the firmware of the PSU is being updated. ⚠ **CAUTION: Do not disconnect the power cable 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 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: When two identical PSUs receive different input voltages, they can output different wattage, and trigger a mismatch.** *For example a 1100W PSU connected to a High-Line AC (HLAC) 200Vac-240Vac input, it will output 1100W. But if a second 1100W PSU in the same system is connected to a Low*

Table 112. AC and DC PSU status indicator codes (continued)

Power indicator codes	Condition
	Line 100-120Vac input, it will only output 1050W, triggering a mismatch.

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 158. Drive indicators

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

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

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

Table 113. 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. ⓘ **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 114. 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.

Getting help

The QRL, SupportAssist/ Secure Connect Gateway, and eSupport sites will be launched in the quarter 4 of the calender year 2022.

Topics:

*   Recycling or End-of-Life service information

Recycling or End-of-Life service information

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

Documentation resources

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

To view the document that is listed in the documentation resources table:
- Using search engines:
  - Type the name and version of the document in the search box.

Table 115. Additional documentation resources for your system

Task	Document	Location
Setting up your system	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
	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.	
Managing your system	For information about systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	www.dell.com/poweredgemanuals

Table 115. Additional documentation resources for your system (continued)

Task	Document	Location
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	www.dell.com/openmanagemanuals > OpenManage Server Administrator
	For information about installing and using Dell SupportAssist, see the Dell SupportAssist Enterprise User's Guide.	https://www.dell.com/serviceabilitytools
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	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